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“Good decision-making”

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Abbreviations

ACU	artificial cognitive unit
ADM	aeronautical decision-making
AI	artificial intelligence
BA	British Airways
CAS	computer-aided/assisted surgery
CBP	capabilities-based planning
CCIR	commander's critical information requirements
CDM	clinical decision-making
CIRS	critical incident reporting system
CoA	course of action
CRM	crew resource management
EAC	emergency or abnormal checklist
EBM	evidence based medicine
FAA	Federal Aviation Association (US)
HBP	heuristics-biases paradigm
HRM	human resource management
HUD	head-up display
IATA	International Air Transport Association
IC	information collection
ICAO	International Civil Aviation Organization
IPB	intelligence preparation of the battlefield
LH	Lufthansa
MDM	medical decision-making
MDMP	military decision-making process
MUM-T	manned unmanned teaming
NDM	naturalistic decision-making
NGO	non-governmental organization
NTSB	National Transportation Safety Board (US)
PIC	pilot in command
PF	pilot flying

PNF	pilot non-flying
QRH	Quick reference handbook
RPDM	recognition primed decision-making
S1	System 1
S2	System 2
SDM	shared decision-making
SOP	standard operating procedure
TDG	tactical decision game
TT	treatment threshold
UAV	unmanned aerial vehicle
VUCA	volatility, uncertainty, complexity and ambiguity
WARNORD	warning order

Abstract

The evaluation of decision quality represents a difficile matter. The general intention to attain *good* choices is undisputed. The present works seeks to understand what particularly *good* decision-making means and how it can be facilitated. Therefore, the quotidian activity of making choices is examined both from a theoretical and practical perspective. The broad perusal of the relevant literature and the results of a qualitative study aim to convey a differentiated understanding of the phenomenon of deciding. Specific aspects like ethicality, cultural influences and professional specifics are intended to complete the holistic point of view.

Introduction

One cannot decide not to decide.[1] – Life consists of an abundance of decisions. This is how change is created. Though everyday marginal decisions are usually made with little effort and attention, other choices require attentiveness and some thought. Regardless of the required effort and the scope: no intentional development[2] can be thought and achieved without making decisions. Undoubtedly, this is in particular true for organizational life which is full of choices: many are daily business and some are of rather fundamental scope. Insofar, Kepner et al. (2006) remark correctly that "choices made today influence our lives tomorrow" (Kepner et al., 2006, p.78). Organizations are built and changed through manifold interwoven decisions over their lifetime. These choices come from inside or from the surrounding world of the organization. Obviously, this is strongly dependent on the personal skills and attitudes, professional experience, competence and knowledge of those who influence and control decisions. Furthermore, many other aspects – like the cultural context, the specific organizational setting, ethical considerations etc. – affect the process of approaching decisions.

The significance of the quality and robustness of a professional decision cannot be underestimated. Therefore, the following – perhaps seemingly trivial – question recurs in the text in order to be answered from different points of view and various contexts.

"What is a good decision?"

In the light of this brief question, concepts and methods for judgement, decision aids of different professional provenience and examples of practical experience are described and discussed. Several approaches, starting from a rational perspective, are presented and evaluated regarding their contribution to the overall purpose – to making a good decision. This includes a plethora of factors, like the management of changing situations, high stakes and uncertainty as well. Choices made by humans[3] cannot be separated from the influences of human behavior and its natural limitations, fallibility and suggestibility. In consequence, these aspects do not relate only to the decision quality, but to the surrounding error culture as well, since the management of potential failure affects decision-making as a whole. Further, the existence of manifold more or less strong constraints and their effective management can have a significant influence on the process of approaching decisions. Individual and collective choices are also part of

[1] In analogy to Paul Watzlawick's axiom "One cannot not communicate".

[2] Marginal note: Rudi Keller (Keller, 2003) explains the results of unintended, though manifest change. In such cases, decisions are not directed at the concretely materialized outcome. He argues that remarkable change can be evoked effectively through unintended individual – and in sum collective – action. Hereby, his argumentation integrates the idea of the "invisible hand" stemming from the economist Adam Smith. The explanatory power of his approach is strong and applicable to many phenomena.

[3] This work narrows the view to manmade decisions.

a larger ethical context, that forms a societal framework of values and standards. Therefore, many organizations translate these ethical standards into their corporate culture. The degree of adherence to these existing and agreed values also reflects the integrity and loyalty of the decider(s). Rarely, but not of less importance, the impact of cultural influences on judgment is part of the theoretical considerations in the literature. The working sphere is fundamentally characterized by its local (business) culture. This phenomenon is partially underestimated or remains even unnoticed in practice. But, it becomes clearly apparent, when e.g. people with different cultural roots and backgrounds come together to collaborate in multinational teams, negotiate contracts for international cooperation – and obviously, when the process does not run as smoothly as expected.

Decision-making is undoubtedly a complex task under the influence of manifold factors: Therefore, an isolated discussion of straightforward decision processes would result in misleading simplification and produce an unrealistic, incomplete picture. In order to attain an impression of this complexity, the present work follows a two-part structure. The first part is dedicated to theoretical considerations about judgement. Therefore, the section provides an overview of selected established methods and procedures for approaching decisions. Several aspects that can have significant influence on decisions will be discussed in this context as well. Among them, topics like intuition, the management of complexity, human limitations, the management of constraints, ethical considerations, and the role of culture are included. The second part of the work, focuses on the more practical dimension of deciding. Therefore, a study complements the theoretical picture. The results of the study are intended to give an impression of practical professional experiences of respondents from various fields of work. A closing summary concludes each part and recapitulates both theoretical and empirical findings.

A simple online search of the above-mentioned key question *"What is a good decision?"* confirms with the heterogeneity of its results the scope of the topic. The results comprise besides psychological interpretations, definitions and methods – mainly with emphasis on rationality – and also brief advice for practical decision-making. Regardless of their intention and perceived quality, all search results have in common, that they illustrate what I intend to sum-up as *"decision-awareness"*. This means the recognition of the decision itself, the relevance of its quality and partially the wish to improve the skills in making judgments. Insofar, this underlines the relevance of clarifying what a *good* decision in a wider sense can be.

Therefore, the present work deals with a combination of a main research question and its associated sub-questions as follows. *What is a good decision?* as the key question shall be clarified based on a discussion of concepts from different provenience and with answers from participants in a survey which is part of this work. Understanding what is meant by a *good* decision is a prerequisite for setting a respective target point and giving the process of judgment a clear direction. The related sub-questions are intended to address aspects that can influence the decision process and the quality of the outcome as well.

Main research question: What is a good decision?

a) *Sub-question: Which factors can influence or hinder decision-making?*
b) *Sub-question: Which strategies can be identified for managing and enhancing the professional decision process?*
c) *Sub-question: Which other parameters can influence professional decision-making and how can they be managed?*

The aim of the work is insofar to present the complex phenomenon of decision-making from different angles and with views on various professional fields. It is assumed, that in an increasingly internationalized and globally interwoven working environment the cultural component cannot be underestimated in the process of deciding. Also, ethical aspects are of relevance for making sustainably good choices. Therefore, these influencing factors are part of the discussion.

1 Structure of the work and methodology

This work examines decision-making both from a theoretical and a practical empirical point of view and therefore consists of two major parts. The first is dedicated to the presentation and discussion of selected theoretical approaches from the decision-making literature. The second part is centered around a questionnaire-based online-study about the practical side of professional decision-making.[4]

Figure 1. General structure of the work

1.1 The theoretical part

The first section of the work focuses on the literature[5] about judgment and covers different approaches for decision-making. A classical rational management approach serves as the discussion's starting point leading to concepts that stronger recognize the influence of the human factor in making choices. Therefore, topics like intuition, gut feeling and other possible – rather behavioral – influencing factors are presented in this context. Emphasis is put on biased thinking, self-control and the management of

[4] An individual section contains detailed information about the chosen research design and the comprehensive documentation of the online survey.
[5] Besides the written sources, also recorded interviews, lectures and podcasts are included.

stressors and constraints. In this regard, inherent human limitations (like bounded rationality, bounded ethicality etc.) and therefore the occurrence of human error can also not be underestimated: on the one hand, failure serves as a source for learning and improvement, but on the other hand, the management of error can influence the entire process of judgment. This is meant in the sense, that fear of failure and possible punishment may lead to hesitation, timid choices – even to decision-paralysis – and to the tendency to conceal mistakes. The application of the Just culture concept can encourage learning from failure and become a resource for improvement of future decisions.

A closer look is taken at how decisions are prepared and made in aviation, medicine and in the military sector. All three professional fields are characterized by significant commonalities: aeronautical, medical and military decision-making takes place in more or less rapidly changing environments and therefore requires constant situational awareness. It involves tasks that require specific skills, professionalism, competence and responsibility. Undoubtedly, a considerable level of stress, time pressure and scarce resources have to be managed as well. Additionally, the aspect of competition plays an important role. Obviously, in military contexts this refers to the (e.g. technologically driven) competitive advantage against the enemy. In aviation and in medicine this relates more to economic factors (e.g. low-cost carriers in aviation) and to the reputation of the organization. Given the fact, that the tasks are complex and the stakes are high, the ability to perform in a team is absolutely essential. But, the possibly most important factor all the three branches have in common is, that they are centered around human life. The mutual commonalities allow the transfer of knowledge and experience between actually entirely different professional fields. Therefore, a comparative view on deciding in aviation and in medicine serves as an example for fruitful interdisciplinary exchange and for learning among different professions.

The presentation of the different professional applications serves also as an illustration for the fact, that any working environment and different corporate culture requires specific adaptations of methods for decision-making. Insofar, individual solutions that suit the particular requirements best can be tailored on the basis of a rich source of elaborated and tested methods. Regardless of the undisputable value of theoretical frameworks and procedures, the present work emphasizes the importance of the human factor, because finally, the decision-maker is the linchpin of a sound choice. Implementation and execution of a decision require a solid professional and reliable foundation, but are not necessarily tied to the individuals who decided on the subject. Insofar, it is important to keep during the decision process the future acceptance and the stakeholder management already in mind. In this work, the discussion of the human factor is extended by considerations about the cultural dimension. The working place is often characterized by internationally mixed teams, worldwide remote cooperation and by contracts between partners from different countries. The literature about intercultural management reveals certain obstacles and challenges concerning mutual understanding and smooth, successful cooperation. Obviously, cultural competence is nowadays a valuable skill in the working environment. Therefore, possible influencing factors on decision-making are part of the considerations.

To sum-up, the aim of the work is to deepen the understanding of how good decisions can be achieved. Relevant factors, that shape the process are put under scrutiny in order to reveal their possible influence on the overall purpose – a sound choice.

1.2 The practical part

The given research issue is at first examined from a theoretical point of view. The perspective of the second major part is the practical side of professional deciding. The discussion of the methodological approaches of decision-making serves as the theoretical backdrop which shall be completed with the more practically oriented, vivid counterpart of personal information obtained with the help of an online-questionnaire. The included study was intended to complement and to test the abstract findings with real-world reference. Therefore, the qualitative research design is a standard method of choice for investigating and understanding real phenomena – like practical deciding. Such phenomena can hardly be quantified and are not entirely measurable in quantitative terms. That is why, here the qualitative view suits the subject at hand best. Additionally, certain quantitative information is obtained as well. According to the advice of USC, three major elements characterize qualitative studies (USC, 2024):[6]

1) ***Naturalistic approach:*** *"refers to studying real-world situations as they unfold naturally"*
2) ***Openness****: "[T]he researcher avoids rigid designs that eliminate responding to opportunities to pursue interesting changes in a flexible manner."*
3) ***Purpose-orientation:*** *"[C]ases for study are selected because they are 'information rich' and illuminative. [T]hey offer useful manifestations of the phenomenon of interest."*

In qualitative surveys individual cases are put under scrutiny against the background of existing theories. Therefore, I chose to examine the topic of professional decision-making on the basis of written responses of practitioners from different branches.[7] Hereby, the method of collecting data with an online-survey provided several advantages.[8] The convenient distribution of the web-based questionnaire in a relatively short timeframe facilitated the collection of data. The respondents were free to choose the time and duration of the participation according to their personal preferences. Insofar, the approach was considered to be flexible and open enough to adapt to the individual readiness to provide information. Besides the paramount aspect of decision-

[6] Hereby, I follow the USC research guide on qualitative research (USC, 2019).
[7] The chosen topic and approach result from the findings of an earlier study that I conducted with engineers from an aero-engine manufacturer and maintenance provider. The qualitative study was centered around semi-structured personal expert-interviews about decision-making in organizational contexts. (Aviation Management Master Thesis "Decision making processes in Aviation Maintenance")
[8] I follow the argumentation of Regmi (2016) regarding the advantages for both the respondents and the experimenter.

making, the specifics of the particular branches were of course also of interest.[9] The mentioned earlier study revealed that there is, according to the former participants, little guidance or education for professional deciding. Therefore, this aspect was integrated in the present study as well. The spectrum of the present participants was intended to be heterogenous with regard to age, years of professional experience, education, occupation and the cultural background. Further, the possible interrelationship of deciding personal matters in private life and making choices in professional contexts was part of the study as well. The total duration of the study (where data is obtained with the online-survey) was five months. After the collection of information, the corpus was prepared in order to put the data under scrutiny. This was followed by an interpretation in the light of the preceding theoretical discussion. The gathered replies are offset against the presented methods and analyzed accordingly. Particular emphasis is put on salient characteristics like intuition, structure of the process, human limitations, cultural influences and teamwork. Again, the recurring guiding question *'What is a good decision?'* is answered with the help of the respondents' statements. The second section of this work provides besides a summary of the gained insights and conclusions, a discussion of the present study's limitations and an identification of possible gaps for further research.

2 Terminology: Decision

Before discussing various models of decision-making, the essential term *decision* requires clarification; a prior working definition is an indispensable prerequisite for the present work. Depending on the scientific provenience, the literature offers a variety of interpretations. Insofar, a uniform definition does not exist. – This is not a disadvantage. This could be primarily an indicator for the complexity of the phenomenon, where the specific view on the subject and the particular context of deciding become apparent. Common lexicon entries explicate decisions as a choice of one direction of action or reaction. Thereby, at least two alternate options to choose from are assumed.[10] Philosophical explanations also suppose an intentional and reasonable choice of an option. Insofar, the approach comprises further aspects like the volitional act, the aim and the implementation path. In addition, conventions, appropriateness and the freedom of will are integrated.[11] A rather psychological approach describes a decision as the process and its result, which leads to preference and commitment to one option over another.[12] This concept includes factors like driving motives, uncertainty, time restrictions, gathering of information, resoluteness and relevance. The perspective of economic sciences is often focused on rational[13], data-driven decision-making on the basis of measurable conditions. This approach clearly favors the choice of the best suitable (feasible)

[9] The study comprises answers from branches like healthcare, aviation, the defense industry, education etc.
[10] See Brockhaus (Brockhaus, 2019 [allgemein]).
[11] See Brockhaus (Brockhaus, 2019 [Philosophie]).
[12] See Feger (Feger, 2019).
[13] The topic of rationality – and the doubt in fully rational decision-making – is intensely and critically discussed in the literature of behavioral economics.

alternative among predetermined options. Simply put, under this perspective, the decision-maker would probably prefer to act like a *homo oeconomicus*. All mentioned approaches[14] have certain basic features in common:

- *existence of options (including omission)*
- *preference of only one option (→ quality/superiority)*
- *permissibility of only one option (no simultaneity → rejection)*
- *intentional choice (decision-awareness)*
- *intended result and steadiness of the decision*

These essential commonalities can be complemented by a linguist view, because several of the mentioned aspects correspond with the etymological derivation and the inherent denotation of the word *decide*. The Latin and Greek roots (*decisio/decidere, κρίση)* have the meaning of *separating/disconnecting.*[15] Stollberg-Rilinger (2024) refers to the meaning of *cut* in the word *decisio.* Similarly, argues the philosopher Thomä (2024) with regard to the Greek counterpart *κρίση.* Both underline the caesura in the course of time between the past with a plethora of possibilities to choose from and the future with the intended commitment to only one option. – Therefore, I intend to understand the key terms of this work as follows:

In sum, ***decision-making*** *as understood an intended, reasonable and consciously directed process that leads to a balanced selection – usually under certain constraints and with bounded rationality.[16] Decisions can be made individually or collectively and organizationally embedded. A* ***decision*** *is the intended result of the decision-making process, that represents the commitment to the one preferred and determined option.*

Table 1 complements the mentioned basic assumptions and summarizes characteristic features of decisions. Many of the items give an impression of the variability and adaptability of the process. Thereby, the dependence on the decider and the role of influencing and constraining effects are of importance. The tabular overview comprises also different stages or constituents of the process. The procedure of deciding is – also due to the human factor – error-prone and vulnerable. Adverse effects of various influences can impair the process and cause in consequence a defective decision. Insofar, the decision quality may be carefully monitored and influenced on many levels under the premise of critical awareness.

[14] Of course, different disciplines follow own specific perspectives on the phenomenon. Stollberg-Rilinger presents her view as a historian and interprets decision-making as a social practice and a cultural technique. She puts emphasis on the discursive nature of deciding. She argues from a historical standpoint, that often social realities are ex-post framed as a decision.
[15] Due to the same reconstructed Indo-European root, this applies also for the German equivalent *(entscheiden)*, that analogously has the meaning of *separating/disconnecting*. See (Duden, 2019).
[16] Constraints can appear, among others, as restrictions concerning time, legal prescriptions, financial resources, personnel, technical equipment, human capacity etc.

Table 1. Features of decisions

Characteristics	Explanation
Information	The quality/robustness of a decision depends on a proper problem definition and the timely supply with adequate, relevant, comprehensive, valid, correct and up-to-date information and its management. This requires ongoing situational awareness during the entire process, dispassionate reasoning, (self-)critical evaluation and reflection (de-biasing). Uncertainty, risks, changes and other relevant influences have to be considered carefully. But, these requirements collide with the limitations of human nature (mental processing, effects of stressors on the decider).
Context-richness	Decisions are not detached from the influence of their particular context (situational, professional, societal, political, cultural, ethical, competition, time criticality, pressure to decide etc.).
Caesura/Nexus between before and after	Decisions represent breaks in continuity: they discriminate and connect the time before and after the choice. The concrete decision arises from its past (preparation, data collection, experience, heuristics, biases) and connects it with the future. Insofar, a decision reaches beyond the present instant, and transforms the future.
Power/Permission/ Agency/Ownership	The decision-maker has the authority and agency to decide. The responsibility for the choice is associated with the specific person(s).[17] In organizational contexts decisions are often prepared by others for a specific decision-maker.[18] In other contexts decisions are made for others. This requires prudence and the formal permission to decide.[19] Ownership means the personal identification with the decision.[20]
Decision-awareness and sensual perception	Decision-awareness means the recognition of a decision to be made and the clarity to commit to a choice. A decision and its preparation are sensually perceivable (written documents, checklists, oral declaration, dispute/consensus, election, effort of mental work, time spent in meetings, visible/conclusive action etc.).

[17] Thomä (2024) explains the tendency to obscure the responsibility for decisions in political contexts with intentionally complicated bureaucratic structures, overcomplex regulations or a long lapse of time. (e.g. to prevent revenge votes in elections)
[18] Such cases require careful attention regarding framing and anchoring effects that can influence the decider and thereby give the decision in a certain direction.
[19] This refers to cases where decisions are made e.g. for a minor in a medical setting.
[20] In medical contexts the aspect of ownership is highly relevant. It represents the patient's identification with the decision, which is crucial for the convalescence.

Decision-threshold/ Tipping point	Termination of the preparatory phase (partially after a conscious pause[21]): tipping point → readiness for commitment/determination of the preferred option = *decision to decide.* (Important aspects: decision-speed, veto, decisiveness)
Intention[22]	Decisions do not happen accidentally. They are driven by conscious proceeding. This does not imply any structured, analytical or methodical process.
Directionality	The process of approaching a decision is directed at a certain aim. This holds true, even if (1) the aim is not associated with change, (2) the decision is intentionally/quietly postponed or (3) the final decision is not made, but the decision problem is effectively solved by the passing time without particular action.[23]
Contingency	Contingency describes the possibility of different solutions for a decision problem due to the different options to choose from. This may include doubt and regret over rejected options.
Simplification	Reduction of ambiguity, complexity and simplification. The process resembles a bottleneck: it reduces the number of acceptable options and narrows the possible courses of action. Comparison acts like a filter and the result determines priorities. (possibility of choice overload/choice paralysis[24])
Comparison	Decision processes contain steps of comparison and weighting. This means comparing one course of action to another or against no action. This leads to a balanced preference.
Limitations	Limited capacities of the decider (power, bounded rationality, bounded ethicality, effects of stressors, level of self-control), scarce resources (time, material, staff, budget, data etc.) and constraints (legal, political, ethical, societal etc.).
Implementation	The decider is not necessarily responsible for the execution/implementation of the choice. In organizational contexts such tasks can be delegated. (important aspect: stakeholder management)
Revision	The assessment of the result (correctness, target attainment, decision quality) can lead to the modification/correction of a decision.

[21] Some decision aids in aviation contain a conscious pause (deep breath) by design. In medical decision-making there are certain pause-points, that indicate the beginning of a checklist.
[22] This work focuses on intentional and conscious decision-making.
[23] Stollberg-Rilinger (2024) explains the occurrence of (strategic) non-decisions in history, where decisions in conflictual situations have been left open and unresolved (tolerance of ambiguity). Over time, the changing circumstances partially led to far more favorable results than a clear decision under the influence of hostility could have achieved.
[24] Choice overload refers to the paradoxical phenomenon, that being overwhelmed by a variety of options impairs effective decision-making. Thomä (2024) mentions the metaphorical "Chinese menu problem" that illustrates the situation, when people are overstrained and therefore incapable of deciding until a hierarchy of (reduced) options is derived.

3 Theoretical approaches of decision-making

3.1 Introduction

In general, the decision-making literature focuses primarily on key aspects like the degree of rationality, the relevance of intuition, the quality of the result, and the particular role of the decider. The present chapter is intended to reflect these central points and to create a theoretical background for the practically oriented parts of this work. The following considerations illustrate the heterogeneity of the perspectives on deciding: On the one hand, emphasis is put on rigid, linear, rule-based proceeding, and on the other the value of intuitive deciding is highlighted. The central question of this work is, how *good* decisions can be achieved, given the fact of the methodical diversity. Insofar, the answers probably mirror this heterogeneity as well. The center of decision-making is – besides the concrete issue – undoubtedly the decider, or the group of deciders itself. The discussion in the literature includes and analyzes this topic as well. The considerations comprise a wide spectrum of aspects like the significance of human limitations (bounded cognitive capacity), the remarkable influences of biased thinking, human error and the management of failure, cooperation in a team, ethicality and personal attitudes of the decider.

Firstly, the common theoretical understanding of ***rational decision-making*** is outlined. In order to illustrate the practical application of rational decision-making, the ***"rational manager"*** concept is presented. This holistic concept from Kepner and Tregoe (2006) serves as an example for how practical decisions with emphasis on a rational and structured proceeding are achieved in economic contexts. Thereby, decision analysis is embedded in a larger conceptual framework, that is characterized by a particular rule-based philosophy. The literature discusses rational decision-making controversially since decades. Thereby, the argumentation underlines the existence of unrealistic assumptions. That is why, the recognition of limitations and their consequences in decision processes led to the concept of ***bounded rationality***. This approach, stemming from Herbert Simon, reflects more the reality of practical rational decision-making. Approaching professional decisions is indeed not free from limitations regarding time, available information and the human capabilities. The latter refers to the limited cognitive capacity and its considerable decline in reliability under severe constraints. These insights represent a more realistic assessment regarding the pragmatic dimension of making choices. This is reflected also in the term ***satisficing***.

Secondly, the central concept of ***heuristics and biases***, that is associated with Daniel Kahneman and Amos Tversky, is outlined. It clearly reveals the general susceptibility of deciders. The essential conceptual distinction between ***System 1 and 2*** thinking is presented as well. Another important view on how decisions are made is associated with the school of ***naturalistic decision-making***. A key element of this approach is the ***recognition of patterns*** in order to make choices quickly. Regardless the differences of the approaches, they are in particular valuable because of their more realistic view on judgment. In sum, these mentioned concepts focus on how *humans* make decisions.

Due to its relevance for decision quality and by reason of of argumentative parallels concerning the aspect of boundedness, a section about ***ethical decision-making*** discusses the significance of ethicality in making judgments. Therefore, paradigmatic approaches from Kidder and Bazerman et al. are outlined. In this context, the concept of ***bounded ethicality*** is presented, that analogously to the concept of *bounded rationality*, assumes (unconscious) limitations of decision-makers that impair the ethical quality of a choice. Also, the management of ***ethical dilemmas*** is discussed. Since, decisions are embedded in a larger ethical framework and thereby reach beyond the actual case, remarks concerning the ethical dimension of decision-making and suggestions for improvement are included.

Part of the theoretical considerations with focus on the capability to influence decision-making, is the concept of ***nudging*** from Richard H. Thaler and Cass R. Sunstein. This approach bases also on behavioristic insights and is centered around the question of how good decisions can be created or better: provoked. Nudging is seen as the use of subtle, but highly effective impulses on decision-making. Insofar, the approach acknowledges and uses the human susceptibility for certain influences. The general intention is making the proceeding effortless and convenient for the decider. The opposite, the so-called sludge, represents factors that hinder good decision-making.

The considerable influence of the cultural background on how choices are made in cross-cultural settings is discussed in a separate section. The concept of ***cultural dimensions*** is presented in three variants, and thereby, the scope of culturally relevant aspects is reflected. The topic of the cultural framework in which choices are approached is rarely part of common decision theories, but its effects on negotiating decisions cannot be underestimated.

The present chapter is then concluded with a summary of the sections' key points. The theoretical presentation is completed in the next chapter with examples of professional deciding from the spheres of aviation, medicine and military. These examples are intended to illustrate, how decision-making processes are adapted to specific professional environments and to the requirements of practical daily doing. Additional focus is put on how beneficial interprofessional exchange can be facilitated.

3.2 Rational decision-making and the concept of Bounded Rationality

Rational decision-making is understood as a thoughtful, analytical, deliberate and structured proceeding in order to achieve an informed choice.[25] The straight-forward and systematic process is characterized by the pursuit of maximizing utility.[26]

> *"In neoclassical economics, rationality mostly refers to the utility-maximizing, consistent behavior of self-interested homo oeconomicus (ECON) who focuses on own personal utility, and now." (Corr et al., 2019, p. 69)*[27]

The common ***rational decision process*** consists of seven subsequent phases and is thereby related to a set of ***general neo-classical assumptions***.[28]

1) *Recognition of the problem or the opportunity*
2) *Gathering of information*
3) *Assessment of the situation*
4) *Development of options*
5) *Evaluation of the options*
6) *Decision = selection of the best alternative*
7) *Implementation, monitoring, adaptive strategy*

The process is initiated by the recognition of a problem (or opportunity) that requires attention and in consequence a decision. In order to approach an informed, robust decision, information is gathered and evaluated. The situation is then assessed in the light of available information. In the subsequent phase the relevant data is organized and a set of options is derived. This phase represents already an early stage of the future choice, since the derivation of options to choose from narrows the scope of possibilities. The evaluation of the options means the assignment of values. Thereby the picture is refined further and the preselection of weighted options is available for the actual decision. On the basis of a thorough preparation, an informed, balanced choice is made. Balanced means here that the options are weighted and assessed with regard to possible risks that are associated with the particular choice. Then, the implementation phase follows and the results of the decision are monitored further. – According to Corr et al. (2019), the central neo-classical concept is characterized by a set of general characteristics.

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[25] See Wheeler (2020) for different definitions of the term rationality.

[26] „The dominant [neo-classically-defined] rational approach to calculate utility, is expected utility theory. It assumes that the logically consistent person has definite preferences, but it recognizes that decisions are made with an element of risk or uncertainty […]" (Corr et al., 2019, p. 72)

[27] Self-interested here-and-now decisions of the neoclassical perspective exclude the future perspective insofar, that "utility maximizing in the medium to long-term […] this is *not* being rational in neo-classical terms" (ibid., p. 70). Under certain conditions, altruistic behavior is also considered to be rational.

[28] The number of phases depends on the individual model.

1) *Rationality is "expressed in consistent preferences and although they are latent (hidden) they are revealed in choice behavior when the incentives are sufficient to motivate [the decider]" (ibid., p. 60).*
2) *Application of "logical forms of reasoning to arrive at judgments and decisions – although people may not know the formal rules and procedures of logical reasoning" (ibid., p. 31).*
3) *Maximization of the personal utility is the goal which is attained "by allocating […] limited (scarce) resources in the most efficient, optimizing manner possible, which [is done] by employing good enough mathematical (but not necessarily conscious) means" (ibid., p. 60).*
4) *Information: The decider acts based on "full and relevant information" (ibid., p. 60). Information is processed in an unbiased manner.*
5) *ECON: The term is associated with the priority of self-interest. (Helping other people is also intended to increase own utility.)*

Corr et al. (2019) summarize the notion of rational behavior and the selected assumptions as follows:

> *"It is assumed that for people to behave in a rational manner […] they must have access to full information and they must process this information in an unbiased way. To the best of their ability, people process relevant information in a rational way to satisfy their preferences and they manage to do so to a good enough extent." (Corr et al., 2019, p. 70)*

The outlined rational procedure bases on the above-mentioned key assumptions. Firstly, the decision-maker is autonomous. Secondly, the decider is omniscient, all relevant information is available and the decider is also capable to process it correctly. Further, the decider is assumed to be analytical, unbiased, not influenced in the choice, acts consistently, has control, and does not err. Also, a stable environment is assumed. The imagination of a human decision-maker that resembles a *homo oeconomicus* is obviously not realistic. That is why, the concept of rational decision-making is critically discussed in the literature. Thereby, central arguments – besides the mentioned unrealistic assumptions – are the inflexibility of the approach (limited adaptability to changing environments), the time-consumption, the occurrence of limitations and the culturally biased way of thinking.[29]

The mentioned limitations comprise primarily three aspects. Firstly, the limited (cognitive) capacity of the decider to manage all available information, complexity, ambiguity, change and uncertainty. Secondly, complete access to all relevant information is unrealistic. And thirdly, the concept does not consider limitations of the

[29] Trompenaars (2020) argues that most economic models are of Western (Anglo-Saxon and U.S. American) provenience and have a biased perspective on activities like decision-making. In consequence, these approaches are not universally applicable.

human nature like fallibility and susceptibility. The critical arguments about the rational approach can briefly be summarized as: The model does not reflect how *real people make real decisions*: "It has long been recognized that the ideal of *homo oeconomicus* […] is not reflected in typical economic behavior" (Corr et al., 2019, p. 81). The recognition of the effects of boundary conditions of the environment and those of the decision maker, led to the theory of *bounded rationality*[30] of Herbert Simon. This perspective on decision-making does not negate rationality at all, but is more realistic due to the findings of cognitive psychology. Insofar, behavioral economics does "not imply a wholesale rejection of the neo-classical approach" (Camerer and Loewenstein (2003) in: Corr et al., 2019, p. 12). Similarly argue Davis (2005) and Corr et al. (2019):

> *"In making any but the simplest decisions, we operate within a complex external environment and have limited cognitive capabilities, time, and other resources. We therefore are rational only within the bounds imposed on us." (Davis, 2005, p. 10)*

> *"These constraints force decisionmakers to construct a simplified mental model of the world. Although decisionmakers may act rationally within this model, the results are not necessarily rational by classic standards." (ibid., p. 77)*

> *"[…] although we may not reach the heights of perfect rationality […] we may still be 'procedurally rational' […]: we are doing the best job possible under (cognitively and emotionally) difficult conditions." (Corr et al., 2019, p. 82)*

Davis (2015) mentions that "it was generally assumed that insofar as people engaged in orderly decision-making […] they were good at it – 'good' being more or less synonymous with 'rational'." (Davis, 2015, p. 9) The connotation of *good* in the context of *rational* proceeding is of interest in this work as well.

The following section focuses on the practically oriented concept of the *"Rational Manager"* which is intended to be implemented in organizational contexts.

[30] Bounded rationality is not irrationality.

The "Rational Manager" Concept

An explicitly holistic concept for guidance and practical application in organizational contexts represents the *"Rational Manager"* by Charles Kepner and Benjamin Tregoe.[31] In the 1960's the authors began to develop and to teach their method to managers in order to equip them with a set of integrated techniques for achieving improved results in their professional doing. Therefore, the concept comprises important functions like problem analysis, decision-making and techniques for improving situational awareness. The overarching aim of the method is to provide "ways of improving organizational effectiveness" (Kepner et al., 2006, p. 1). The authors consider their broad, integrative approach more as a way of thinking, understanding and seeing challenges than a collection of separate components. This is also reflected in the particular mindset that stands behind the approach, because it goes beyond the modular or separate application of the methods. Therefore, the authors emphasize both, the significance of organizational homogeneity and the relevance of seamless interaction in teams.[32] The implementation of the concept requires not only training, but overall acceptance in the organization as well.[33] Undoubtedly, the introduction of a new organizational philosophy, new routines and guidelines leads to frictions, hesitation and hence requires persuasive efforts and time.[34] Therefore, the authors conclude, respectively:

> *"To improve an organization, we must introduce good ideas, establish the means for making them work, and provide a visible payoff for the effort involved." (ibid., p.8)*

In order to pave the way for successful collaboration and for fostering mutual understanding, the authors assume four *basic patterns of thinking*[35] in the form of four essential guiding questions. These patterns are intended to be taught and implemented as the basis for the desired programmatic mindset. The identified patterns correspond with human modes of perception and interpretation of the surroundings:

1) *Perception, clarification and analysis of the situation*
2) *Understanding connections like cause and effect*
3) *Making choices based on the gained understanding*
4) *Anticipation of future developments in relation to the current state*

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[31] See Kepner et al. (2006).
[32] (ibid., p. 7)
[33] The application of the concept in singular departments is possible, but the authors recommend its organization-wide implementation for reasons of homogeneity and increased effectiveness.
[34] In part, and also for reasons of loss aversion, people might react with reluctance to change. Kepner et al. (2006) clearly recognize this and explain that "[h]umans embrace change that seems good for them or good for the world they live in and care about" (ibid., p. 8).
[35] These patterns are reflected throughout the entire *"Rational Manager"* paradigm.

These four patterns are indeed essential – and therefore not unique to the present concept – that is why, they reappear in this work in various contexts.

Table 2. Four basic patterns of thinking[36]

	Pattern of thinking	Related question	Explanation and field of application
1.	**Clarification and analysis**	*What's going on?*	*Observation and perception of the situation, clarification of the current status of affairs, management of uncertainty and disorder, requires situational awareness* → **Situation appraisal**
2.	**Understanding cause and effect**	*Why did this happen?*	*Interpretation of the issue/situation through causal relations for a better understanding, identification of adequate solutions* → **Problem analysis**
3.	**Making choices**	*Which course of action should we take?*	*Choice on the course of action to achieve the envisaged goal* → **Decision analysis**
4.	**Anticipation**	*What lies ahead?*	*Taking the future perspective for anticipating demands/opportunities/emerging problems* → **Potential problem and opportunity analysis**

As shown above, the four patterns indicate – reflecting their specific focus – already their primary field of application. The connection is obvious:

four patterns of thinking → four rational processes

This link is of importance, because it is, according to the authors, key to the universal applicability of the concept. Therefore, Kepner et al. (2006) explain, that "[t]hese processes are systematic procedures for making the best possible use of the four patterns of thinking. […] This is why the […] processes are universally applicable, regardless of cultural setting or the content against which they are applied" (ibid., p. 13).[37]

[36] According to Kepner et al. (2006).
[37] With regard to the international dimension of management, multinational enterprises and the effects of globalization, the intercultural aspect of the approach cannot be underestimated.

The rational processes[38] include each a detailed framework for solving the particular task adequately. In all of the four areas, emphasis is put on adherence to a strictly systematic, rational, transparent and efficient proceeding on the foundation of reliable information. As an indispensable precondition for performing the analyses, understanding and hence correct application of the prescribed methods is required.

Table 3. Four rational processes[39]

	Patterns of thinking	Related rational processes and their purposes
1.	**Clarification and analysis**	**Situation appraisal** *Purpose: Clarification of the situation, reduction of ambiguity and complexity, assessment of the current status*
2.	**Understanding cause and effect**	**Problem analysis** *Purpose: Precise and systematic analysis of the concrete issue and identification of possible solutions*
3.	**Making choices**	**Decision analysis** *Purpose: Achieving a balanced, workable and realistic decision based on sound information.*
4.	**Anticipation**	**Potential problem and opportunity analysis** *Purpose: Analysis of future perspectives (anticipation of difficulties, recognition of future opportunities, taking active influence on the future developments, planning ahead)*

In this context, the authors mention the relevance of good teamwork[40] and emphasize mutual understanding and shared terminology as crucial for succeeding with rational processes. The mutual language of the "*rational manager"* paradigm, applied by the team-members, is expected to level out cultural differences in collaboration.[41]

The approach does not generally exclude flexibility or adaptation in practice, but according to the authors, correct adherence to the method promises better results. That is why, the authors conclude: "Rational Management aims at major change and therefore demands major commitment" (ibid., p. 19). The advantages of the approach are its consistent, transparent and systematic proceeding. The availability of a documentation and training for the employees, represents an advantage as well. But, the implementation is also associated with the clear commitment to the method and time-consuming

[38] ibid., p. 13pp.
[39] According to Kepner et al. (2006).
[40] The authors state, that "[w]hat is required today is not total teamwork in all aspects of life; rather, it is a selective, functional teamwork […] when needed, limited to those activities where it will be most productive" (ibid., p. 18).
[41] Hofstede and other authors put much emphasis on the impact of cultural aspects in multicultural constellations. Their explanations of mutual understanding are more differentiated. See also: Hofstede (2001 and 2011) and Meyer (2015).

monitoring of correct adherence to the concept. The *"rational manager"* philosophy is skeptical towards professional intuition (which arises from valuable professional experience) because it cannot be quantified. Nevertheless, it may indirectly influence decision-processes. In sum, the approach represents a valuable decision aid for management, because of its capability to structure complexity with transparent, systematic processes. Due to their general structure, the rational procedures can be implemented in manifold professional contexts and branches, since the cornerstones – systematic analyses of problems, decisions and opportunities – are relevant for any working field. All of the concept's processes are more or less interlinked and structurally widely similar.

The component of ***problem analysis*** relates to the second of the four basic thinking patterns and represents the systematic causal analysis of the problem. Thereby, the aim is achieving a robust and effective solution, that is based on a solid and clear foundation. Often, teams or individuals are confronted with complex problems in conditions of restricted time and under significant pressure.[42] In such cases, problem analysis can provide guidance and orientation in order to act reasonably, in a coordinated and controlled manner. The mentioned thinking patterns are of relevance, since they are considered to be the mental framework of all rational processes. In the present context, cause-and-effect clarification is obviously the predominant pattern. The problem analysis procedure consists of the following six stages:[43]

1. *problem statement (problem recognition)*
2. *specification of the problem*
3. *development of plausible causes*
   (from experience, knowledge, diagnosis of changes)
4. *testing of causes vs. specifications*
5. *determination of most probable cause*
6. *observation, verification of assumptions, fixing and monitoring*
   (if the result is not satisfactory – new procedure, again: problem statement)

The initial statement is crucial, and represents an essential prerequisite for paving the right way to the desired outcome. The following steps are not less important, but the starting point has to be defined especially carefully. The correct identification of the problem depends directly on the results of thorough situation appraisal.[44] In general, the particular contribution of problem analysis is associated with the creation of a common understanding of the concrete issue. Accordingly, the authors state, that "[i]f we fail to find the true cause of a problem through these techniques, it is because we failed

[42] The solution of grave problems (electricity, oxygen supply) aboard Apollo XIII is a remarkable example. Kepner et al. (2006) explain, that part of the solution was an abbreviated procedure of problem analysis due to fragmentary information and time restrictions. (ibid., p. 57 pp) The example illustrates the considerable degree of discipline required not to follow impulsive action.
[43] ibid., p. 26
[44] For all methods that are presented in this work, situational awareness and correct situation appraisal are of fundamental importance with regard to problem solving and decision-making.

to gather and use information appropriately" (ibid., p. 46). In contrast to superficial perception, the authors perceive problems as structurally similar and summarize, that "[i]t is knowledge of this structure that enables us to move systematically from definition to description to evaluation to hypothesis to confirmation of cause" (ibid., p. 44). Similar to problem analysis, the proceeding of ***potential problem (opportunity) analysis*** is structured in six stages.[45] In this procedure, the view is directed into the future and hence corresponds to the thinking pattern of anticipation. This process is connected to decision and problem analyses as well. If upcoming difficulties are identified, adequate preventive measures can be taken. The analysis comprises the following steps:

1) *action statement (intention for action and the desired result)*
2) *specification of potential future problems/opportunities*
3) *causes for potential problems/opportunities*
4) *actions to prevent or to promote the cause*
5) *preparation of actions to reduce/enhance effects of problems/opportunities*
6) *setting appropriate triggers towards the target*

The benefit of potential problem/opportunity analysis is the availability of an institutionalized method for organizational foresight: future orientation is developed independently from randomly followed ideas or personal preferences. Rather, the process ensures deliberate analysis and transparency. Foresight is related to the anticipation of opportunities, challenges and obstacles while coping with omnipresent competition and uncertainty. This genuine managerial task is here put into a framework, that structures complexity, facilitates the collection of ideas and prevents them from remaining idle. Lost, forgotten and undocumented ideas concerning future opportunities and problems are unused valuable potential of an organization.[46] Insofar, the sixth step reflects the future-orientation of an organization in order to "build the future according to […] visions and desires" (ibid., p. 166).

The discussed rational processes require as an indispensable precondition a clear and comprehensive impression of the situation. Throughout this work, the fundamental importance of ***situational awareness*** is highlighted repeatedly in various models of decision-making. In order to handle a confusing, complex situation, it is necessary to break the task down into manageable components. Further, it is crucial to set the correct priorities and to manage them appropriately. This proceeding includes monitoring of simultaneous developments as well. In general, situation appraisal is considered to be a starting point for further procedural steps: a thoroughly conducted assessment of the present conditions supplies the subsequent analyses with necessary information and influences the entire proceeding in a positive manner. With regard to decision analysis, situation appraisal helps to identify specific demands (for equipment/additional staff),

[45] ibid., p. 165 pp

[46] Kepner et al. (2006) state accordingly, that "[i]n a competitive world, the balance between success and failure is often narrow. The winning margin is often no more than that which is gained by foreseeing the future and changing it, in some degree" (ibid., p. 164).

significant changes in circumstances (legal prescriptions/framework), growing uncertainty (towards reliance of supply) or in questioning the current status of affairs. To structure the phase of ***situation appraisal***, Kepner et al. (2006) recommend the following proceeding in five consecutive steps:[47]

1) *Collection of threats and opportunities (current/future concerns)*
2) *Identification, separation and clarification of concerns, specification of required actions*
3) *Assessment of severity, urgency and estimated development*
   result: relative priority
4) *Determination of the required analysis for the specific case*
   connection to: decision analysis or problem analysis
5) *Determination of the appropriate further proceeding based on sound situation appraisal (continuous monitoring, ongoing situational awareness)*

The choice regarding the connection to the analysis tools is made in the fourth step. The completed process of situation appraisal can lead as a preparatory step to decision-making. Kepner et al. (2006) clarify that "[p]roductive coherent action – as opposed to simple reaction to the event of the moment – depends on the sound basis for choice" (ibid., p. 12). Then, the process of (well-informed) decision analysis can be initiated. Kepner et al. (2006) explain in this context, that

> *"[t]he point is not to divide concerns among the three boxes for subsequent full application of Problem Analysis, Decision Analysis, or Potential Problem (Opportunity) Analysis. The point is to use those ideas from each technique that are most suitable and time efficient for resolving concerns" (ibid., p. 178).*

From this perspective, the approach appears as a flexible, practically applicable and interwoven set of management aids. Undoubtedly, ***decision analysis*** represents an integral part of the rational approach. It is understood as meaningful, planned action in order to achieve a carefully predefined aim. The authors define three components of decision analysis:[48]

1) *Determination of the purpose*
2) *Consideration of available options*
3) *Assessment of the relative risks of available options*

With regard to decision quality, three elements are identified to be essential for *good* decision-making. These factors are closely related to professional experience and significantly contribute to achieving the desired result of the process.

[47] ibid., p. 169
[48] ibid., p. 12

"Making good choices depends on three elements: the quality of our definition of specific factors that must be satisfied, the quality of our evaluation of the available alternatives, and the quality of our assessment of the risks associated with those alternatives." (ibid., p. 79)

The aspired quality of the outcome depends strongly on a concise decision statement, because it initiates the rational process of decision-making. The process consists of nine consecutive steps in order to achieve a conscious, informed good choice.

Table 4. The phases of decision analysis[49]

	Phase	Explanation
1.	**Decision statement**	*Identification and concrete designation of the choice dilemma*
2.	**Definition of objectives**	*Definition of the relevant criteria for the concrete decision*
3.	**Classification of objectives**	*Classification and assignment of the objectives to the categories of MUSTs and WANTs* *MUSTs: mandatory criteria, minimum requirements for the concrete choice* *WANTs: desirable/optional criteria*
4.	**Weighting of the *WANTs***	*Assignment of importance for each WANT criterion*
5	**Generation of alternatives**	*Selection of a number of appropriate, reasonable alternatives*
6	**Screening through the *MUSTs***	*Consideration of the minimum requirements, elimination of invalid/insufficient alternatives*
7	**Comparison of alternatives** against the defined *WANTs*	*relative quality of alternatives* *distinction: GO or NO GO (dropped out)*
8	**Identification of adverse consequences**	*Outlook: consideration of possible scenarios after the choice, prognosis of probability and severity*
9	**Decision** Making the best, balanced choice	*Actual choice* *Conscious selection of the derived best alternative*

[49] According to Kepner et al. (ibid., p. 85 pp).

The relevance of the ***decision statement*** is undisputable, because it sets both the baseline and the initial direction for the entire process.[50] Moreover, it represents a general framework for all further steps, since it already contains the relevant parameters. Finally, the concrete choice is measured against the initial decision statement, and result of the decision process reflects (the accuracy of) the statement from the beginning. The decision statement is refined in the second step, that stands for the ***definition of adequate objectives***. This requires accuracy, because "[o]bjectives are clear measures of the ends we want to achieve, for only with clear measures we can make reasoned choices" (ibid., p. 81). The next step, the ***classification of objectives***, represents further refinement, since the stated criteria are divided into the categories of *MUSTs* and *WANTs*. This clear distinction structures the criteria and thereby reduces complexity. On the one hand, the identified *MUST* objectives, are defined as "mandatory; they *must* be achieved to guarantee a successful decision" (ibid., p. 82). They represent minimum requirements. On the other hand, *WANTs* are the residual objectives, which are not less relevant, since they are the basis for the comparative evaluation of the alternatives, where the *WANTs* are the benchmark. Their "function […] is to give us a comparative picture of alternatives – a sense of how the alternatives perform relative to each other" (ibid., p. 82).[51] For that purpose, in the stage of ***weighting the WANTs***, the objectives are assessed by the assignment of values[52], that reflect the importance of the criterion.[53] This proceeding is capable to reasonably structure the selection for the next phases of the analysis. Undoubtedly, the course of the process can be influenced intentionally during the selection and weighting of the objectives. Deciders should keep this in mind and steer the process attentively.

After having compiled the set of objectives, the ***generation of alternatives*** represents the first, slight anticipation of a possible choice.[54] The authors clarify, that "[w]e must […] evaluate each available alternative by measuring it against all of our objectives. It is the relative quality of that fit that concerns us" (ibid., p. 83). The evaluated alternatives can already be tempting to make a premature choice, but the aim is to filter out the alternative, which best meets the stated objectives[55] – with the lowest associated

[50] The authors explain, that „[a] decision statement always indicates a choice, some kind of action and its intended result. […] It also indicates the level, or implied prior decisions, at which the decision is to be made " (ibid., p. 81).
[51] In the case of *quasi-MUST* criteria, due to their high importance, they are subsumed to *WANTs* with a higher indicator of weight.
[52] Concerning the weighting of the criteria and the successive comparison, the authors admonish to remain cautious, if no or too many alternatives match the criteria. In such cases the parameters and the alternatives have to be revised and perhaps even adapted.
[53] In more complex decision analyses, the objectives can be arranged and summed-up in subgroups. Later, these sub-groups are reintegrated into the process with a single value. This proceeding allows to divide the workload and to sustain transparency as well.
[54] The generation of alternatives narrows down the choice in the framework of decision analysis: it creates a limited set of variants.
[55] The remaining alternatives are examined separately, in order to assess their individual risks. (There is no interdependence.) The assigned values will be the discriminating factor and

risk. That is why, the authors strongly insist on not omitting the next step, that represents the ***identification of adverse consequences*** of the residual feasible alternatives. This phase is a valuable opportunity to prevent making a premature decision. Overseeing or ignoring risks can cause (costly) negative consequences for an organization, therefore a thorough assessment of realistic threats to the implementation or the long-term outcome has to be conducted carefully. This is an obligation of responsible management in order to ensure a robust and sustainable result. The conducted risk assessment does not necessarily lead to the rejection of a good alternative. On the contrary, a critical review and adequate adaptations can improve the alternative and turn a risk into a manageable parameter. The process is finally completed by making the ***decision***.[56] This does not necessarily equal an ideal solution, since the process is intended to lead to a realistic, workable decision. Kepner et al. (2006) emphasize, that achieving a *good* decision depends on the "thorough study and careful evaluation of all relevant information" and on the adherence to "[…] a methodical, systematic process" (ibid., p. 85).[57] Apart from the stringent, rational approach, the authors indicate on the valuable influences of intuition, instincts and the inner voice.[58]

As mentioned before, the process is despite its stringency not protected against flaws due to influences on selection, weighting or making assessments. Effects of framing, biased or also wishful thinking can occur and are related to the human factor. Therefore, it is crucial to anticipate and to cope with these phenomena professionally.[59] In this regard, the comprehensive and transparent documentation is an inherent advantage of the process. That is why, the authors recommend written explanations regarding the individual stages. They can be completed and enriched with additional comments, so "necessary information [will be] available for anyone who must approve the final decision" (ibid., p. 89). The transparent procedure is also an advantage for the integration of new information, problem solving or learning from the process. The professional communication in the process is guided, purpose-oriented and equally systematic for all participants, which levels out personal idiosyncrasies to a certain degree.

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consequently of significant importance for the final choice. The highest value suggests – but does not determine – the preference for an alternative.

[56] Kepner et al. (2006) remark, that the results of a complete decision analysis and a free choice can be equal, "[b]ut the validity of the former is a thousand times greater, for all elements that go into the decision remain accessible and visible" (ibid., p. 108).

[57] The authors stress repeatedly the significance of correct application – while being aware of limitations and weaknesses – of the process. Negligence, overseeing facts, or incorrect assessments in conducting the analysis can impair the quality of the result.

[58] ibid., p. 85 (This is partially in contradiction to the mentioned skepticism towards intuition.)

[59] In this context, Bazerman et al. (1993) highlight the relevance of self-reflection in order to understand what compromises rationality on the individual level: "To negotiate rationally, you must understand what makes you sometimes think irrationally, while anticipating similar irrationality from your opponents" (Bazerman et al., 1993, p. 67).

The outlined *"rational manager"* approach from Kepner and Tregoe comprises a comprehensive set of analytical tools for managers. The concept is oriented on following four *rational processes* according to the concrete task. The methods are derived from four assumed *basic patterns of thinking* that determine the selection of the adequate process. The processes are clearly structured, and are therefore capable to systemize complexity and to direct the required proceeding in a meaningful way. The concept respects the specifics of organizational structures and emphasizes the role of good professional teamwork.

The presentation of the essential components of the concept was followed by more detailed considerations about *decision analysis*. This component is in particular dedicated to approaching decisions with emphasis on a rational proceeding. The process is oriented on transparency, diligent analysis, measurable and thus comparable parameters. The analysis is based on a concisely elaborated initial decision statement that defines the orientation for the entire process. The final decision quality is significantly determined by the correct adherence to the prescribed procedure, the careful completion of all steps, and reasonable assessments regarding risks, opportunities and assumed values for weighting. Insofar, the question concerning decision quality may be answered in a relative sense:

What is a good decision?

A well-balanced choice of the best alternative after having considered and evaluated all available information. This includes the recognition of possible adverse consequences.

"A good decision is one that will work"[60] *– and that answers the initially stated demand in the relatively best way.*

"A good decision is a rational decision."[61]

Possible, hypothetical answers to the question in the present context have a clear pragmatic orientation, that reflects the professional application of the procedure. Insofar, the "rational manager" approach can be interpreted as an utilitarian method, that focuses on the rule-based, correct way to make an informed rational choice.

[60] ibid., p. 85

[61] See again the previously mentioned remark of Davis (2015) regarding the synonymous understanding *rational = good*. (Davis, 2015, p. 9)

3.3 Decision-making and intuition – The naturalistic paradigm

Rational approaches of decision-making put obviously strong emphasis on a clear, measurable, data-driven, stringent and transparent proceeding for making informed choices. The results are intended to be explicitly derived from the analysis of available data. The adherence to procedures of rational analysis reflects the utilitarian philosophy behind the approach. (Following the rules and guidelines ensures at least procedural correctness in contexts of uncertainty.) The advantages of such a proceeding are related to their (formal) reliability, the transparency of the process and to the capability to reduce ambiguity and complexity. Especially, in organizational contexts, where approval processes and documentation are required, this is of relevance.[62]

The considerations in the rational context revealed, that professional intuition, gut feeling, hunches and personal expertise are generally recognized and also valued to a certain degree. But, the capabilities of developed intuition are conceptually widely ignored. Kepner et al. (2006) summarize that "[i]ntuition and judgment work best from a base of good information" (Kepner et al., 2006, p. 204). This is true, but other researchers like e.g. Klein, Simon and Plous, go further, since they acknowledge and integrate the mentioned phenomena into their understanding of practical decision-making. Perhaps, intuition is partially misunderstood or confused with non-analytical, impulsive, non-calculated, inaccurate or careless preparation of decisions, which leads to flawed results. Simon (1997) therefore clarifies that

> *"[w]e must not confuse the 'non-rational' decisions of the experts – the decisions that derive from expert intuition and judgment – with the irrational decisions that stressful emotions may produce" (Simon, 1997, p. 139).*

Therefore, a remarkable amount of scientific research including extensive fieldwork is dedicated to understanding intuition, judgment and the role of experience in decision-making. That is why, Klein[63] and Plous[64] examined how decisions are approached in naturalistic settings. The following aspects characterize such settings:

> *"Features that help define a naturalistic decision-making setting are time pressure, high stakes, experienced decision makers, inadequate information (information that is missing, ambiguous, or erroneous), ill-defined goals, poorly defined procedures, cue learning, context (e.g. higher-level goals, stress), dynamic conditions, and team coordination" (Klein 1999, p. 4).*

The researchers observed people from various branches in their particular working environment and put their decisions under scrutiny. The research was conducted with

[62] Legal requirements, accounting standards, the ethical framework of the organization or technical demands characterize these internal processes.
[63] See also Klein (Klein, 1999, 2004 and 2011).
[64] See also Plous (Plous, 1993).

particular focus on people, who are due to their tasks forced to work and to decide under pressure. Among the probands[65] were firefighters, nurses, policemen, pilots and others.[66] – Hereby, the common professional characteristic is the setting where professional decision-making takes place. – These professionals are expected to decide not only correctly, but quickly under (time) pressure, uncertainty and with the possibility of severe consequences in case of failure.[67] The aspect of time criticality is interpreted here in a relative sense, since time constraints have to be assessed in relation to the concrete task at hand.[68] Another important characteristic of naturalistic decision-making is the factor of high stakes that has to be assessed in the context of the present task as well. The severity of possible negative consequences has to be evaluated accordingly, as Klein explains: "When a fire-ground commander makes a poor decision, lives can be lost. When a design engineer makes a poor decision, hundreds or thousands of dollars can be lost" (Klein, 1999, p. 4).[69]

For working in the above explained contexts of ***naturalistic decision-making*** *(NDM)*, Klein (1999)[70] assumed initially a general awareness of decision-making. The probands confirmed indeed being aware of their responsibility, the challenging situation and the importance of a correct solution. Surprising for the researchers, none of them reported to follow a structured approach which includes also proceedings that integrate the comparison of alternatives. Instead, the probands told: "We don't make decisions". Klein (2004) interprets this statement accordingly: „In fact, to hear them describe it, they didn't really consider anything; they just acted "(Klein, 2004, p. xiii). According to the probands' self-assessment, no conscious, methodical process was applied, although they were obviously highly proficient in making professional choices. Insofar, the results of Klein's extensive field research reveal relevant facts, among them the obvious absence of a comparative evaluation of options as it is applied in approaches with focus on rationality. The respective ***singular evaluation approach***[71] refers to the evaluation method in a decision-making process where the existing options are assessed individually, and are not compared or weighted against each other.

[65] Klein assumes (prototypically) proficient decision-makers. The studies include novices as well.
[66] Individual sections of this work focus on decision-making in aviation, medicine and military.
[67] The aspect of failure and human error is of high importance in these high-stakes contexts. For aviation, Just Culture represents an institutional framework for the management of failure with strong emphasis on learning from mistakes. The organizational treatment of mistakes has significant effects on decision-making. The fear of negative consequences might, for example, lead to hesitancy, avoidance of decisions or to choices that might meet primarily personal interests.
[68] Klein (1999) compares the temporal aspect regarding decision-making of firefighters, and design engineers and concludes that time pressure is fundamentally different only at first sight. That is why, it requires assessment in the light of the task. (ibid., p. 3)
[69] Shoffner (2000) argues that "decisions […] must be made in the current, or natural environment that does not resemble the past. The model encourages bold action and is forgiving of mistakes. Mistakes are acceptable as long as they are learned from and are seen as a normal part of an evolving process where the decision-maker is constantly learning". (Shoffner, 2000, p. 21).
[70] See also Klein (1999) for the detailed considerations. (Klein, 1999, passim).
[71] ibid., p. 20

This approach is in line with the explanation stemming from Simon (1997)[72], which is called ***satisficing***[73]. Simon (1997) clarifies, that

> *"[b]ecause administrators satisfice rather than maximize, they can choose without first examining all possible behavior alternatives and without ascertaining that these are in fact all the alternatives" (Simon, 1997, p. 119).*

In clear contrast to the mentioned rational perspective of a *homo oeconomicus*, who would prefer to select only the best available alternative, the administrator tends rather to satisfice, which means to "look […] for a course of action that is satisfactory or *good enough*"[74] (ibid., p. 119). The argumentation is insofar convincing, since it considers the naturally limited capacities of human beings. That is why, Simon concludes that "[s]implification may lead to error, but there is no realistic alternative in the face of the limits on human knowledge and reasoning" (Simon, 1997, p. 119). This proceeding efficiently leads to a choice, but it reflects its circumstances and constraints. Regarding the outcome, Klein summarizes that "[t]he emphasis is on being poised to act rather than being paralyzed until all the evaluations have been completed" (Klein, 1999, p. 30). The initially described rational approach from Kepner et al. (2006) appears to be more time consuming, inflexible and relatively complex even when applied for simple decision analysis.

The approach of Klein (1999) for making decisions in naturalistic settings is known as the ***recognition-primed decision model*** (RPD) which is based on the capabilities of deciders to recognize patterns in a situation rapidly, and to draw reasonable conclusions in order to attain an adequate solution. Thereby, the effectivity of the recognition depends on the degree of situational familiarity. This criterion influences considerably the further course of action. According to Klein (1999), the course of action depends on imagination, since the decider simulates mentally how to proceed. (Klein, 1999, p. 30) The assessment on the basis of familiarity replaces in the naturalistic context the comparison of options. Similarly, imagination is here the substitute for structured analysis and comparison of the given alternatives. Imagination serves also as way to identify a workable option. – The intended choice does not equal an uncritical, superficial or impulsive decision. – Rather, the perspective and the approach are entirely different.

These findings led to a closer investigation of intuition in order to understand how it is built, and how it influences practical decision-making. Beyond that, Klein (1999) identified essential contributing factors for decision-making, the ***"sources of power"*** which are understood as cognitive mechanisms. They are contrasted with "what people

[72] See also: Simon (Simon, 1997, p. 118 pp) and Klein (Klein, 1999, p. 20).
[73] The term *satisficing* was coined by Simon and represents a portmanteau consisting of the units *satisfying* and *suffice*.
[74] Simon provides examples for satisficing criteria like: "market share, reasonable profit or fair price" (Simon, 1997, p. 119).

do when they are not using deductive logic or probability theory" (ibid., p. 285).[75] Thereby, the author indicates remarkable human potentials and strengths, that unfold significant effects whilst being diffuse.

> *"We have found that people draw on a large set of abilities that are sources of power. The conventional sources of power include deductive logical thinking, analysis of probabilities, and statistical methods. Yet the sources of power that are needed in natural settings are usually not analytical at all."*
> *(Klein, 1999, p. 3)*

1) *The power of intuition*
2) *The power of mental simulation*
3) *The power of spotting leverage points*
4) *The power to see the invisible*
5) *The power of stories, metaphors and analogies*
6) *The power to read minds*
7) *The power of the team mind*
8) *The power of rational analysis*

The particular value of these mechanisms is associated with both managing effortlessly quotidian activities and dealing with unfamiliar, uncertain situations.[76] That is why, these phenomena are considered to be powerful and effective – yet not in categories of rationality which does not diminish their inherent value.[77] Having said that, however, the direct operational applicability remains unresolved.

The following tabular overview summarizes Klein's approach according to the postulated sources of powers.[78] (Klein, 1999, p. 3, passim).

[75] Klein (1999) clarifies, that he and his colleagues „have tried to understand what people were doing and why their strategies might make sense, instead of seeing the lack of rationality as a failure of intellect "(ibid., p. 285).
[76] Besides Klein, also Plous and Simon agree upon these human capabilities. See also: Klein (Klein 1999, 2004 and 2011), Plous (Plous, 1993) and Simon (Simon, 1997).
[77] Klein (2004) recapitulates the deep skepticism towards his research regarding intuition in the light of the strong belief in rationality. (see: Klein, 2004, p. xiv)
[78] The powers (1) – (7) are non-analytical, since they base on experience. Only (8) is analytical.

Table 5. The theory of sources of powers[79]

	The power of…	Explanation
1.	**intuition**	*"The power of intuition enables us to size up a situation quickly." (ibid., p. 3) "Intuition depends on the use of experience to recognize key patterns that indicate the dynamics of the situation" (ibid., p. 31).*
		***Experience**: builds intuition; learning from practice and training*
2.	**mental simulation**	*"The power of mental simulation lets us imagine how a course of action might be carried out" (ibid., p. 3).*
		*for diagnosis and understanding a situation (**situation appraisal**).*
3.	**spotting leverage points**	*"The decision maker […] can try to use experience to identify leverage points and construct a new course of action" (ibid., p. 114).*
		*This refers to the detection and use of **opportunities**.*
4.	**seeing the invisible**	*"Experts can perceive things that are invisible to novices: fine discriminations, patterns, alternative perspectives, […] and the process of managing decision-making activities" (ibid., p. 175).*
		***Expertise** is key for refined perceptive skills and deeper understanding. (correlation with years of professional experience). **Managerial horizon**: anticipation, noticing change, competent management/interpretation of information.*
5.	**stories, metaphors and analogies**	*"The power of metaphor lets us draw on our experience by suggesting parallels between the current situation and something else […] The power of storytelling helps us consolidate our experiences to make them available in the future, either to ourselves or to others." (ibid., p. 3) "Stories organize events into a meaningful framework. [They] are similar to mental simulations […]" (ibid., p. 196).*
		***Communication of experiences**: storytelling, related to building expertise.*
6.	**reading minds**	*"The ability to read a person's mind depends on familiarity with that person and the clarity with which [the] intent is described." (ibid., p. 232)*
		*Refers to seamless, anticipatory, **nonverbal understanding** and close interaction with others (good teamwork).*
7.	**the team mind**	***Teams** are seen as "intelligent entit[ies]" (ibid., p. 233). Therefore, "[t]he team-mind develops basic competencies and routines, forms a clear identity, learns to manage the flow of ideas […]" (ibid., p. 257).*
		*Teams accumulate significant experience, expertise and knowledge. (The **collective mind of a team**)*
8.	**rational analysis**	*Rational approaches "provide […] the benefits of orderly and systematic approaches to complex problems" (ibid., p. 261).*

[79] According to Klein (1999).

Concerning ***intuition***, Klein (1999) assumes a direct correlation between the strength of intuition and the number of years of professional experience. Accumulated experience facilitates the fast recognition and appropriate assessment of situations. Since intuition is related to gained experience, it is therefore generally accessible to learning and training. Insofar, Klein continues, that "[t]he part of intuition that involves pattern matching and recognition of familiar and typical cases can be trained" (ibid., p. 42). That is why, simulations, education programs or on the job training can develop employees' intuitive qualities.

The power of ***mental simulation*** is understood as a cognitive mechanism that allows the generation of more or less plausible courses of action and possible explanations. Simulation connects hereby the future and the past coherently to its origins. Internal evaluation helps to eliminate as implausible considered scenarios. Due to the limited mental capacity, only a certain number of parameters, causal factors and transitions can be simulated, whereas too complex scenarios cannot be handled reliably. Undoubtedly, mental simulations are not necessarily true. They rather represent acceptable or plausible sequences. Klein (1999) does not see this as a weakness, since "they are a means of generating explanations, not for generating proofs" (Klein, 1999, p. 68). From a managerial perspective, mental simulation facilitates making projections into the future. Thereby, imagination allows to construct and to compare courses of action, eases the detection of flaws and prepares the decision-maker mentally. Despite the benefits, Klein (1999) indicates, that people might overestimate the accuracy and validity of an explanation or an imagined course of action, insofar it is key to sustain awareness of influences like wishful thinking, manipulation or uncritical application.

The so-called ***power to see the invisible***, is similarly related to professional experience and in particular to the ability to simulate mentally. Klein (1999) understands this capability also as crucial for anticipation, future projection and the perception of details, which requires mental flexibility, professional experience and the ability to handle a considerable amount of information in a given timeframe.[80] Professional experience becomes also apparent in the capability to detect fine discriminations.[81] In some contexts this refers to noticing fine, yet significant discrepancies which requires more than factual and procedural knowledge, but accumulated experience. Klein (1999) explains

> *"that experience does shape decision making. Experienced people have an impressive ability to withstand time pressure and generate plausible options so they do not have to waste effort and attention by comparing lots of options" (ibid., p. 168).*

Expertise is also a relevant from an organizational point of view. Mixed, heterogenous teams undoubtedly benefit from having experts, that novices can learn from. Besides documentation and manuals, knowledge and experience are predominantly

[80] "The appropriate time horizon depends on the reaction time of the system at different levels" (ibid., p. 156).
[81] See Klein (ibid., p. 157).

associated with competent individuals. The direct and open-minded exchange among team-members can support the transfer of knowledge. Therefore, Klein (1999) stresses, that "knowledge is a resource and should be treated as such" and continues that companies often miss to manage knowledge in a sustainable manner:

> *"In organizations, much of the knowledge is held within the heads of the workers and is never shared. This is tacit knowledge. In most organizations, the culture seems to ignore the expertise that already exists, to take it for granted," (ibid., p. 170).*

Often, this deficit becomes apparent when employees – and thereby expertise – leave the organization. Depending on the quality of documentation, valuable information may become inaccessible as well.[82] With regard to the serious shortage of skilled professionals, this topic is not a minor matter.

Often, ***metaphoric thinking*** is superficially associated with being solely a literary trope in figurative language. Of course, this is not the case: On the contrary, research[83] provides sound evidence, that metaphors (and metonymies) are means, that structure perception, thinking and communication based of analogy.[84] Mostly this is unrecognized and happens unconsciously, since these patterns are assumed to be inherent to human nature. Moreover, the vivid figurative nature of expressions usually fades by the time, becomes less expressive and is finally not perceived as a metaphor anymore. This represents a common, unintentional process of pragmatic and semantic language change, which also includes the vanishing of expressions.[85] This steady development demonstrates the strength, adaptability and impressive productivity of language, because depending on the field of application new metaphors can be created easily. This allows the use of metaphors – which are generally analogies – in any sphere of (professional) life.[86] The analogous structure of thinking and storytelling is indeed efficient, and Klein (1999) concludes that "[m]etaphors and analogues direct thinking by framing situation awareness, identifying appropriate goals, and flagging relevant pieces of information" (ibid., p. 213). He also considers analogues as a forecasting instrument and continues, that "[a]nalogical predictions are most helpful when there is a good database but not enough information to apply more rigorous analyses" (ibid., p. 213).

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[82] The results of an earlier qualitative study conducted by the author of this work confirm these facts. (based on expert interviews, [manufacturer, aviation industry])

[83] See Lakoff and Johnson (Lakoff et al., 2004).

[84] For that reason, metaphors are common in literature. Expressive, not faded metaphors are therefore a strong literary stylistic device.

[85] Well established, widely understood, and therefore often unconsciously applied, productive metaphoric fields are imageries of light, health, ways, mechanical engineering, nature etc.

[86] Klein describes a case of a manufacturing company that successfully organized their data of completed production for further documentation by *analogical* reasoning. The company can retrieve similar cases in the past, that ease the work on new projects, since the information is accessible and comparable. (ibid., p. 212 pp)

The power to read minds *(6)* reflects both relevance and advantages of effortless mutual understanding in professional contexts. People, who are working together for a long time, often develop a mode of very efficient collaboration and communication. This is enabled through so-called mind reading. In such cases, colleagues know each other and the task so well, that they are able to understand and partly even anticipate the colleague's thinking and doing. This reduces time and effort of in-depth explications. Additionally, this strengthens teamwork significantly. Besides the value of mutual understanding, clear communication with regard to intent is nevertheless important. Klein (1999) states, that "[w]hen you communicate intent, you are letting the other team members operate more independently and improvise as necessary. You are giving them a basis for reading your mind more accurately" (ibid., p. 222). Undoubtedly, the capability to communicate goals clearly and competently is a cornerstone for good management, including decision-making.[87]

> *„Industry, educational settings, health care – all depend on the ability to communicate goals to others and to request clarification of goals where needed "(ibid., p. 229).*

Klein refers in this context to the commander's statement of intent, a method with origins in the military decision-making process,[88] which is applicable also in other professional spheres. In short, it sums up for others what is expected to be done. Thereby, a common ground is prepared with the same understanding of the task. The statement of intent is not supposed to be extensive. Rather, it should be as concise and short as possible. In doing so, enough room for flexibility, creativity, improvisation and independent thinking is left. Insofar, it is not intended to be an explicit provision but more a definite framework. Consequently, the team can unfold its potential; individual abilities are seen and valued. This implicates also reducing control to a certain degree.[89] Simultaneously, it demonstrates trust and confidence in the team.

The described set of experiential sources of power is completed with the ***power of rationality***. Regardless Klein's critical opinion about strictly rational approaches, he explicitly values the inherent strength of rationality: "It comes closer to error-free decision making than any other sources of power" (ibid., p. 261). This advantage results from the clear, unambiguous and systematic structure of rational processes. Klein interprets the nature of rational thinking as a combination of four sequentially organized components. (ibid., p. 261 pp) Thereby, decomposition is considered to be the starting point and a means for reasonable segmentation of a task into its constituents. This is

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[87] Experience shows, that this is often not accomplished well enough: inefficiency, frictions and discontent weaken work processes significantly. (These aspects are part of the lean management approach, where such frictions and obstacles are understood as *waste*.) Also to request clarification is difficult at times, since people may try to avoid an embarrassing situation.

[88] The characteristics of the military decision-making process are discussed in more detail in an individual section of this work.

[89] Consequently, the recommendation of Klein (1999) is: "Just do not fall into the trap of choreographing each of their movements" (ibid., p. 227).

followed by decontextualization, in order to eliminate the ambiguity of the concrete case. Calculation and description are the last stages, according to Klein (1999).

1) *Decomposition (segmentation of the task)*
2) *Decontextualization (reduction/elimination of ambiguity)*
3) *Calculation*
4) *Description*

Alike, the other sources of power, specific boundaries characterize the rational variant. These are related to human limitations or inadequacies in conducting the individual steps. Often, this is a matter of interpretation and judgment. Therefore, Klein (1999) concludes, that "[t]he analytical methods run into limits when we try to use them without recourse to the experiential sources of power. The problem is not rationality but hyperrationality" (ibid., p. 264). Insofar, his assertion can be interpreted as an advice for following an intermediary approach, that integrates rational analysis as well.

In conclusion, the presented concept of *recognition-primed decision-making* bases fundamentally on a non-analytical, *naturalistic approach*, which incorporates predominantly experiential *sources of power*. This does not diminish the role of rational, analytical proceeding at all. Rather, the approach takes a different perspective. Based on field-research, Klein acknowledges strong influencing factors on decision-making, especially in natural settings. Since Klein sheds a light on the underlying mechanisms, benefit can be derived in order to understand and improve management skills including decision-making. In contrast to other approaches, Klein proposes no general routine to be followed, rather, his descriptive findings can be applied to support and enhance any chosen decision-making process. He states, that "[m]ost real-life decisions are not amenable to this approach [of rational decision making]" (Klein, 2004, p. 21). Insofar, he expresses doubt, that such procedures are applicable to complex, confusing and changing environments.[90]

Simon's (1997) conclusive argumentation reconciles intuition, judgment and rational proceeding. At times, intuition is virtually perceived as unreasonable in the context of professional deciding, since it is neither tangible, measurable nor quantifiable. Therefore, intuition does not appear explicitly in current models. But undoubtedly, it plays a significant role as Klein demonstrated. Simon explains as follows:

[90] Klein remarks, that in his opinion, managers do not apply the prescribed procedures in reality, even if some might believe it and insist on following a rational approach. (Klein, 2004, p. 20) This fact is also discussed later in the context of professional decision-making in this work, when partially methods are observed superficially, conducted only for the procedure's sake or are even applied after the actual decision is already made in order to justify the choice.

"[I]t is a fallacy to contrast 'analytic' and 'intuitive' styles of management. Intuition and judgment – at least good judgment – are simply analyzes frozen into habit and into the capacity for rapid response through recognition of familiar kinds of situations. […] Every manager needs to be able to respond to situations rapidly, a skill that requires the cultivation of intuition and judgment over many years of experience and training. The effective manager does not have the luxury of choosing between 'analytic' and 'intuitive' approaches to problems."
(Simon, 1997, p. 139)

Both authors demystify the term intuition and stress the value of experience for successful and competent management. Simon (1997) continues, that "[i]ntuition, judgment and creativity are basically expressions of capabilities for recognition and response based upon experience and knowledge" (ibid., p. 128). Klein (2004) explains that "through our research we came to appreciate that intuition is not a mystical gift that can't be explained" (Klein, 2004, p. xiv). The mentioned diffuse phenomena can be explained to a certain degree. The described interdependence of experience, expertise and intuition explains, how valuable professional intuition is developed over time. Acknowledging the advantages of a synthesis, Simon (1997) concludes, that "we do not need to postulate two problem-solving styles, the analytic and the intuitive" (ibid., p. 129). According to his argumentation, the rigid dichotomy can be abolished, and the benefits are apparent, since rational processes can be accelerated and improved. Being aware of inevitable organizational requirements (like continuous documentation), limitations of teamwork (difficulties in consensus finding, conflicts) and other realistic restrictions in practice, feasible ways to integrate intuition reliably are still a desideratum.[91]

What is a good decision?

"Simon proposed that people 'satisfice' rather than optimize when they make decisions. To satisfice is to choose a path that satisfies your most important needs, even though the choice may not be ideal or optimal." (Plous, 1993, p. 95)

A good decision means realistic and good enough – with respect to the desired result.

A good decision is one that works.

[91] According to Shoffner (2000), this fact is also associated with didactic difficulties. Clear, unambiguous models are more suitable for educational purposes.

3.4 The Heuristics and Biases Paradigm

The section of rational decision-making concluded with remarks about the assumption of bounded rationality. Limitations regarding cognition, time and other resources of the decision maker are reflected in the concept of Simon.[92] Kahneman and Tversky also observed deviations from the postulated ideal of rational proceeding in decision-making. Based on extensive empirical research, evidence for the significance of heuristics and biases in making judgments was provided. Both reduce, among others, effectively the mental effort of the decider facing a complex problem. Heuristics are therefore applied as mental shortcuts. Biased thinking, that reflects certain inclinations or tendencies, can be observed systematically as a mechanism that reduces mental effort, too.[93]

> *"[Heuristics and biases] describe our tendency to think in certain ways (biases) and our use of rules or mental shortcuts (heuristics) to make decisions quickly, without the expenditure of too much cognitive effort." (Corr et al., 2019, p. 94)*

As will be shown later in the context of professional decision-making, the reduction of complexity and making choices in a limited amount of time is of high practical relevance. Insofar, understanding, anticipating and managing these mechanisms adequately is key. The latter aspect refers in particular to the advice to de-bias – if even possible – the process of decision-making, since heuristics and resulting biased thinking can lead to undesired simplification, incorrect interpretation and error.

Two systems of cognitive and affective processing – The Systems 1 and 2

The heuristics and biases paradigm is closely tied to Kahneman's concept of two systems of processing: *thinking fast and thinking slow* summarizes briefly both, the essential arguments and ascribed characteristics of the assumed systems. Kahneman explains his understanding:

> *"Systems 1 and 2 are not systems in the standard sense of entities with interacting aspects or parts. And there is no part of the brain that either of the systems would call home" (Kahneman, 2012, p. 29).*

Kahneman (2012) argues that the "division of labor between System1 and System 2 is highly efficient: it minimizes effort and optimizes performance" (ibid., p. 25). The contribution of S*2* is seen in specific contexts like deliberate decision-making. In such cases, the results of *S1* activity may be not appropriate or insufficient, and hence *S2* is more suitable. The advantages of *S1* are its quick results in quotidian contexts, although the quality of the results may differ. The faster speed of *S1* is associated with the

[92] Simon first introduced the topic of heuristics. (Corr et al., 2019, p. 94)

[93] Besides heuristics and biased thinking, other mechanisms indeed influence how choices are made as well. Among others, the endowment effect, ambiguity aversion, risk aversion, priming, framing etc. are of relevance.

availability of heuristics and biases. *S2* is characterized by its limited capacity, therefore it is applied for specific purposes. In the light of the significant amount of routine decisions, long-term *S2* use would inevitably lead to fatigue.[94]

Table 6. Main characteristics of the Systems 1 and 2[95]

System 1 (S1)	**System 2** (S2)
Definitions	
*"**[S1]** operates automatically and quickly, with little or no effort and no sense of voluntary control."* *(Kahneman, 2012, p. 20)*[96]	*"**[S2]** allocates attention to the effortful mental activities that demand it, including complex computations. The operations of [S 2] are often associated with the subjective experience of agency, choice and concentration."* *(Kahneman, 2012, p. 21)*
Explanations (attributes, contexts)	
implicit/nonconscious, procedural, reflexive, fast, biased, intuitive, emotional, habitual	slow, explicit, conscious, more logical, deliberate, orderly, reflective, controlled
for routine decisions	for making deliberate choices
e.g. observation of emotional S1 responses to ethical questions	limited capacity and prone to fatigue, associated with self-control in order to overcome S1 impulses[97]

Heuristics

The understanding of heuristics is related to the perspectives of two different research positions. On the one hand, there is the *heuristics and biases paradigm* of Kahneman and Tversky, and on the other hand the concept of *fast and frugal heuristics* of Gigerenzer. The dispute between both schools is centered around terminological aspects and the perspectives on biases, heuristics, and intuition. Gigerenzer (2022) doubts in the theoretical discrimination between Systems 1 and 2 and the role of biases in this conceptual framework. (Gigerenzer, 2022, p. 144 pp) Therefore, he proposes a different view on biased thinking and intuition. Regarding biases, he objects to the predominant notion that biases represent erroneous thinking. The argumentation follows a relative position as Wheeler explains, because "[f]or the fast and frugal program the question is under what environmental conditions, if any, does a particular heuristic perform

[94] See Choudhury et al. (2024) for more details about the occurrence of decision fatigue.
[95] According to Corr et al. (2019, p. 113 pp), Bazerman et al. (2011, p. 35), Kahneman (2012, passim) and Thaler (2015, p. 111).
[96] See also Kahneman (2012, p. 105) for a comprehensive list of *S1* features.
[97] Gigerenzer (2022) does not agree with this perspective. He argues that intuition is valuable and can both be influenced and actively built. See: (Gigerenzer, 2022, p. 146).

effectively. If the heuristic's structural bias is well-suited to the task environment, then the bias of that heuristic may be an advantage for making accurate judgments rather than a liability" (Wheeler, 2020).[98] In consequence, the *fast and frugal program* aims to identify the specific conditions under which a heuristic is supposed to lead to better results.

In general, heuristics are understood as "mental shortcuts that are automatic, intuitive and do not require conscious thought – they just 'feel right' and, often in terms of outcomes, they are right" (Corr et al., 2019, p. 94). The following definitions reflect the main facets of heuristics.

> *"The technical definition of heuristic is a simple procedure that helps find adequate, though often imperfect, answers to difficult questions. The word comes from the same root as eureka." (Kahneman, 2012, p. 98)*

> *"A rule of thumb, or heuristic, is a conscious or unconscious strategy that ignores part of the information to make better judgments. It enables us to make a decision fast, with little search for information, but nevertheless with high accuracy. […] The widespread idea that heuristics are always second best and more information and computation are always better is incorrect." (Gigerenzer, 2014 p. 269p)*

> *"Heuristics are simple rules of thumb for rendering a judgment or making a decision" (Wheeler, G., 2020)*

Heuristics are effective, but clearly not infallible. Kahneman and Tversky derived ***three classes of heuristics*** that often appear in the context of decision-making.[99]

1) *Availability heuristic*
2) *Representativeness heuristic*
3) *Anchoring and adjustment heuristic*

Availability heuristic explains effortless remembrance and its effects. Additionally, the specific evaluation of the remembered matter is relevant and "[t]he basic idea is that when an unlikely or infrequent event comes to mind, we tend to overestimate its occurrence" (ibid., p. 96). Insofar, this type of heuristic explains the observable tendency to being influenced by "a single story that leaves a greater impression than a wealth of

[98] Davis (2000) underlines that "[a]ll heuristics can enable making reasonable judgments with a minimum of effort. The resources and effort required to do marginally, if at all, better are often expensive" (Davis, 2000, p. 17).
[99] Later, two more categories – *judgment heuristics* and *evaluation heuristics* – were added. The phenomenon of *affect heuristics* is also mentioned in the literature, which refers to the role that feelings (excitement, fear, influences of ambient stimuli) may play in deciding. (ibid., p. 104)

statistical data" (ibid., 96). Another effect is the *illusory correlation* which represents the perceived connection of genuinely independent matters. That means that "two separate variables are paired together in such a way that overestimates their frequency" (ibid., p. 96 p). Therefore, elements that are easily retrieved from memory may lead to a distorted impression. The application of ***representativeness heuristics*** is related to thinking in terms of categories that are based on prototypes.[100] This mechanism also represents a reduction of mental effort due to the easy identification of a category. This might as well lead to undesired prejudice. Corr et al. (2019) refer to possible errors in this context, because the occurrence of the recognized matter can be under- or overestimated, which is termed *base rate fallacy*. The ***anchoring and adjustment heuristic*** relates to the estimation of a number in relation to a given (arbitrary) reference point. This means, that the set numerical anchor influences the estimation significantly. Corr et al. (2019) remark that the "effect is stronger when the decision needs to be made fast" (ibid., p. 100). The remarkable stability and influence of anchoring on decision-making cannot be underestimated, since such anchors may impair consistency and compromise assessments. Corr et al. (2019) sum-up that

> *"[…] everyday behavior is governed by heuristics and biases, which lower the cognitive effort of decision-making. As a consequence, humans systematically deviate from rational behavior" (ibid., p. 104)*

Biases

Biases are mainly understood as erroneous thinking due to the subjective perception of reality.[101] As the empirical research of Kahneman and Tversky revealed, the identified biases represent widespread patterns of thinking. Eldridge (2024) argues that biases "are generally thought to be a result of mental shortcuts. The human brain is constantly [confronted] with information, and the ability to quickly detect patterns, assign significance, and filter out unnecessary data is crucial to making decisions, especially quick decisions" (Eldridge, 2024). From this point of view, heuristics and biases are highly efficient. The following table comprises a partial overview of (unmotivated) biases[102] that can have considerable – and questionable – influence on judgment.[103] Insofar, general awareness of biases and their effects on the resulting decision is of importance.

[100] From a linguistical point of view, this cognitive mechanism is also reflected in the language. The field of prototype semantics examines language-specific prototypes.
[101] Gigerenzer disagrees with the generalized negative connotation.
[102] By the time, more biases have been identified: "The set of cognitive biases now numbers into the hundreds, although some are minor variants of other well-known effects" (Wheeler, 2020). See also Decision Lab (2024) for a comprehensive list of cognitive biases and both Gigerenzer (2020) and Pinker (2021) for critical remarks in this regard.
[103] This relates to the extensive discussion in the literature concerning biased thinking in the field of medicine, that can lead to adverse and serious consequences for patients.

Table 7. Partial overview of unmotivated cognitive biases[104]

Type of cognitive bias[105]	Explanation
	Memory
Availability	*Recent, recently recalled or emotional events are more effectively available or retrievable by memory.*
Imaginability	*Event seems probable because it can be easily imagined.*
Representativeness	*Event seems more probable if it is typical of its category.*
Testimony	*Recalled details may be concise, coherent, but incorrect.*
	Naïve statistics
Base rate[106]	*Normal occurrence rates may be ignored which leads to false interpretation.*
Sample size	*Patterns are recognized/overestimated, even if the sample size is not sufficient for doing so. The sample size is partially also ignored.*
Frequencies and probabilities	*Equivalent data are perceived differently when they are expressed in frequencies or probabilities.*
	Adjustment
Anchoring	*Relates to estimations of numbers/values. Assessments are made in relative, rather than absolute terms. They are influenced by the baseline, even if it is arbitrary determined. Focus is kept on the initial value that remains the anchor for comparison.*
Conservatism	*New information is accepted reluctantly or ignored. (relation to status quo bias and inertia)*
Regression	*Events may be over-weighted, ignoring likely regression to the mean.*
	Presentation
Framing	*Influence on perception depending on the presentation of facts. (different perception of events as gains or losses depending on framing of the context)*
False analogy	*False perception of the adequateness of an analogy.*
Attribution	*Information may be unreasonably rejected/accepted/preferred if the source is disliked or liked.*
Order	*First and last-mentioned items tend to be over-weighted.*

[104] See (Davis, 2000, p. 12), Eldridge (2024) and Kahneman et al. (2000, passim).
[105] Availability, representativeness and anchoring biases may result from the before mentioned homonymic types of heuristics.
[106] Davis (2000) explains that [c]linitians place undue faith in positive test results for rare diseases, ignoring the low base rate of the disease in the population and the greater likelihood that the positive result is due to a testing error" (Davis, 2000, p. 13p).

	Choice
Status quo/ habit	*An option is chosen because of its familiarity that is associated with the impression of reliability. Often related to loss aversion/the endowment effect, retention of the status quo.*
Attenuation	*Simplification of decision-making by discounting uncertainty.*
Inconsistency	*Judgments for ideal cases may be inconsistent.*
	Confidence
Completeness	*Apparently complete data leads to discontinuation of the search, (false) assumption of completeness (example from medicine: unfounded discontinuation of gathering of information, premature diagnosis)*
Confirmation	*Search for only confirmatory evidence (other is rejected, inappropriate dissonance reduction), reinforces existing opinions, ignorance of contradictory evidence*
Illusion of control	*A sense of control may be unduly enhanced by good outcomes obtained for the wrong reasons*

As seen, biased perception is often guided by wishful thinking or convenient, uncritical interpretation. Convenience and relative ease are reflected in the aspects of familiarity, habit, confirmation and completeness. Unjustified relations, unfounded connection of facts, ignorance towards the base rate and sample size indeed lead to quick, but incorrect results. Insofar, the quality of judgment suffers significantly from biased thinking and even more under time pressure. The considerations about the *heuristics and biases paradigm* emphasized the remarkable influences of both phenomena on decision-making. The diverging opinions regarding biased thinking add rather an additional perspective to the topic. The perception of biases not only as deficient thinking, but also as an efficient cognitive mechanism under certain circumstances, may broaden the discourse regarding non-rational proceeding. The proponents of *naturalistic decision-making* acknowledge the effectivity of heuristics and quick pattern recognition/matching in naturalistic settings. The argumentation bases on the assumption that "so-called cognitive errors reflect valuable heuristics that help humans cope with massive uncertainty and their own foibles by taking advantage of environmental clues" (Davis, 2000, p. 16). Nevertheless, the preceding tabular overview contains many types of biases that lead to undesired deviations in approaching sound decisions. Insofar, strategies to manage biases adequately are an important contributing factor to making *good* decisions. Challenging decisions, professional interaction in teams and the critical review of choices can contribute to gaining experience in the detection of biases. The section focused on unconscious biases, but decisions can, of course, also be influenced or steered in a conscious manner. This means, that framing, anchoring or the status quo bias can be exploited. Time restrictions even amplify these mechanisms. In the preparatory phase of decisions – particularly in organizational settings with the delegation of preparatory tasks – this may be of relevance. Transparent proceeding, documentation and general sensitivity for human susceptibility can inhibit such undesired influences.

3.5 Ethicality in decision-making and the concept of Bounded Ethicality

The theoretical considerations in the literature about decision-making deal primarily with functional or procedural aspects. Among others, the acceleration of the process, mechanisms related to the human factor, the capabilities of technical support, efficiency, and education are predominant topics. But obviously, ethical aspects are rarely an explicit part in most considerations and models. In the sphere of medical decision-making – as will be discussed later in the respective section – ethical aspects are an integral part of the day-to-day practice of shared decision-making (SDM), since the patient's role and the active involvement have undoubtedly influence on the person's recovery. Notwithstanding the SDM approach, other approaches clearly lack (probably unintendedly) explicit ethical components. Approaching professional decisions in a responsible and sustainable manner, requires an appraisal regarding their ethicality, since the choices are made within an organization and thereby represent it. Professional decision-making takes place in a broader context. Therefore, it is not solely oriented on the concrete demands of the task at hand, rather, it is embedded in an ethical framework that comprises the personal, professional, organizational and societal attitudes and standards of ethicality. Undoubtedly, many organizations attach importance to ethical standards and take training in ethicality for their employees, annual reports and internal guidelines seriously. But regardless of these focused efforts, Bazerman et al. (2012) diagnose both on the personal and collective institutional level grave discrepancies between the intended and actual ethical behavior. Insofar, it is worthwhile, to take a closer look at this gap – the "blind spots" in ethicality – and the mechanisms behind them (Bazerman et al., 2012). Therefore, this section focuses on ethicality in decision-making and presents at first a rather traditional approach and then a behavioral explanation.

Ethical dilemmas

Considerable strains in making choices do not result, according to Kidder (2009), primarily from the elementary dichotomy *right versus wrong*: they are more related to the distinction of *right versus right*. This insight leads to the assumption of fundamental ethical dilemmas that "are genuine dilemmas precisely because each side is firmly rooted in one of our basic, core values" (Kidder, 2009, p. 18). The four deducted paradigms of ethical dilemmas and associated core values are as follows:

Core values: honesty, respect, responsibility, fairness and compassion

1) *Truth versus Loyalty*
2) *Individual versus Community*
3) *Short-term versus Long-term*
4) *Justice versus Mercy*

Kidder stresses, that "[t]hese four paradigms appear to be so fundamental to the right-versus-right choices all of us face that they rightly can be called *dilemma*

paradigms" (ibid., p. 18).[107] In contrast to the clearer *right versus wrong* opposition, these conflicting positions cannot be resolved easily, since the adherence to each alternative would individually represent a right, good choice. (Thereby, the choice of both alternatives is not an option.) In order to cope practically with these dilemmas, Kidder (2009) recommends a structured proceeding beginning with the determination of the adequate paradigm type for the issue at hand. The categorization of the dilemma type aims to promote the reduction of confusing complexity. Instead of perceiving the concrete case as unique, Kidder (2009) emphasizes the advantage of typing which leads to the recognition that the issue is "an ultimately manageable problem, bearing strong resemblance to lots of other problems and quite amenable to analysis "(ibid., p. 23). This approach reduces and isolates the core conflict from confusing information. Moreover, clarity contributes to the prevention of apathy or decision paralysis. Further approximation to one alternative and further clarification is aimed by the identification of a tendency. Kidder (2009) argues that "[r]esolution requires us to choose which side is the *nearest* right for the circumstances. And that requires some principles for decision-making" (ibid., p. 23). Therefore, in his argumentation traditional moral philosophical principles are integrated.

1) *Ends-based thinking: The utilitarian perspective (consequentialist approach/teleological view) focuses on the quality of the outcome of the decision. (Two variants according to Kidder (2009): act and rule utilitarianism. (ibid., p. 156)) This requires a prognosis (speculation) and an assessment regarding the advantages of the assumed possible outcomes. This means the evaluation of beneficial and adversary effects (weighing of alternative futures, cost-benefit analysis) of the choice. According to this preference, the best alternative – the greatest good for the greatest number – is chosen in consequence.*[108]
   Criticism: uncertain future, speculative forecasting, limited predictability concerning the consequences of individual/collective actions, questionable calculus

2) *Rule-based thinking: In contrast, the deontological view (anti-/non-consequentialist approach) bases primarily on the observance of principles.*[109] *Here, the correct compliance with duty/obligation and principles is intended to concisely pave the way to an indefinite and uncertain outcome. The reasoning behind this perspective is based on the argument that forecasts about the results are per se*

[107] See Kidder (2009) for a multitude of practical examples regarding ethical dilemmas.
[108] Hörnle (2023) critically discusses (anti-) consequentialist approaches in criminal law and includes difficile examples with regard to regulations of medical triage (access to limited resources) and to aviation security law (airliner shoot in order to protect others). Core of the discussed dilemmas is the weighing of goods in the utilitarian approach. See both Kidder (2009) and Hörnle (2023) for more detailed argumentation.
[109] This approach is associated with the *Categorial Imperative* of Immanuel Kant. Kidder (2009) quotes from Kant that "[w]hat is essentially good in the action, consists in the mental disposition, let the consequences be what they may" (Kidder, 2009, p. 157).

limited in their reliability. – Insofar, higher emphasis is put on the proceeding in order to ensure a sound preparation of the decision.
Criticism: strictness, unrealistic demand for universalizability

3) *Care-based thinking: This perspective is oriented on the recognition of the reciprocity of human action, and thereby reflects the "Golden Rule". The dictum "do no harm to others" of practical ethics is a cornerstone of manifold established cultural, traditional or religious convictions that have for many a morally binding character.*
Criticism: (among others criticized by Kant) simplicity, unspecific concept, arbitrary determination of the other part of the reciprocal relation

These general, well-known principles are – among others – due to their unequivocal concepts helpful for reflecting and observing ethical aspects and standards in practical deciding. Neither are these principles undisputed or doubted, nor do they solve the particular dilemma instantly, rather they are useful in assessing the case from different angles. Kidder (2009) argues, that "[t]he task of any conscious reflection on moral choice […] is to make explicit what's often left unsaid, to help systematize the fragmentary and order the haphazard" (ibid., p. 163). In order to resolve the dilemma, also Kidder (2009) stresses the significance of intuition and skills of the decision-maker. Particularly, for emerging situations with considerable time pressure, good intuition is key in approaching decisions.

> *"Developing real skill at […] ethics requires […] that the processes be internalized, and that decisions be made quickly, authoritatively, and naturally. For […] a moral thinker, making good decisions usually requires a patient investment in process – and plenty of practice." (ibid., p. 182)*

As seen, decision-making requires awareness and clarity about the relevance of the ethical dimension of judgment. General sensitivity for this matter, education and familiarity with principles and approaches for resolving such cases can provide guidance. Insofar, Kidder (2009) recommends an approach consisting of nine steps in order to structure the ethically oriented decision-process. The proceeding clearly resembles other methodical approaches of decision-making.[110] The recognition of an ethically relevant issue marks the beginning of the process, which excludes other phenomena already at an early stage. The next steps comprise the allocation of responsibility or moral obligation to make a choice. Further, the clear distinction of a right vs. right or right vs. wrong case is made in order to apply the described resolution principles. These phases pave the way to the concrete choice. The process concludes with a feedback step to ensure further learning and building decision experience from the issue.

[110] Another approach consists of four phases: *Moral Awareness (1) – Moral Judgment (2) – Moral Intention (3) – Moral Action (4)*. (Bazerman et al. 2012, p. 29) The authors doubt the proceeding.

Table 8. The phases of ethical decision-making[111]

Phase		Explanation
1	**Recognition of a moral issue**	*Identification of **relevant issues** requiring attention regarding ethicality, separation of moral issues from other questions (e.g. economic, aesthetic, social conventions).*
2	**Determination of the actor**	*Clarification of **responsibility** = moral obligation and empowerment (not question of involvement), depending on the approach determination of stakeholders.*
3	**Gathering of relevant facts**	*Collection of **information** (including details about how the situation unfolded, involved persons and their contribution, their opinions and motives) and assessment of potential developments in the future (scenarios).*
4	**Test for *right vs. wrong* issues**	*Clarification of the question of **wrongdoing** with the legal test at first. If the result is positive: primarily legal matter. Additional tests/intellectual games for further clarification possible (gut feeling, test of publicity, measurement against moral paragons).*
5	**Test for *right vs. right* paradigms**	*Selection of the dilemma-type according to the four **dilemma-paradigms** (truth/loyalty, self/community, short-term/long-term and justice/mercy). Aim of classification: clarity about the concrete dilemma and the values*
6	**Application of resolution principles**	*After having gained clarity about the dilemma-type, the three **resolution principles** come into effect. Aim: further clarity.* *1) Utilitarian principle (ends-based)* *2) Kantian principle (rule-based)* *3) Golden rule (care-based)*
7	**Investigation of "trilemma" options**	*Possibility of a third option or **compromise** to solve the dilemma. (creative solution)*
8	**Decision**	*Making the **actual choice.*** *(involves/requires moral courage)*
9	**Revision/reflection on the decision**	***Feedback loop** to the decision-making process, lessons learned to build expertise, adjustment of the moral compass*

[111] According to Kidder (2009).

The table illustrates a systematic decision process that aims to attain clarity and to create a thoughtful basis for solving challenging ethical dilemmas in a practical manner. The benefit of the proceeding can be associated with the avoidance of both extremes: decision paralysis and hesitancy or thoughtless, hasty action when facing a tough choice. The last phase of the process is directed to building experience and thereby strengthening intuition. The latter is particularly relevant for making critical judgments in limited time and under pressure. The discussion of decision-making in the fields of medicine, aviation and military of the next chapter will highlight the relevance of ethical considerations. Kidder (2009) explains his position, that the observance of ethical standards cannot be reasonably related to the specifically affected area of life – be it private, public or professional.[112]

> *"We're tempted to think that each discipline, profession, and avocation has its own set of moral principles, its own unique ways of thinking about ethical dilemmas […]. True, each has issues unique to its field. […] But when you strip away the specifics and penetrate to the core values underlying these dilemmas, the resulting ethical structures lend themselves to just the sort of analysis and resolution developed here."*
> *(Kidder, 2009, p. 188 p)*

Insofar, the individual professional contexts and the respective settings of ethical dilemmas have to be considered carefully – not ethicality itself with regard to a specific profession.[113] The line of reasoning bases on the rejection of ethical relativism. A correlation of ethical values to other parameters (professional, cultural or other applied norms) would lead to inconsistency[114] and undesired flexibility of ethical standards. In particular, the reliability and robustness of ethical norms in professional contexts is of high importance. Schoeman (2013) argues that transparent and professional communication of substantial ethical decisions is both internally and externally relevant for organizations. Pascarella (1997) and Schoeman (2013) summarize Joseph L. Badaracco's key points concerning ethical dilemmas in business contexts:

> *"Right-vs.-right decisions can reveal the priorities of your values and those of your organization. The question is not whether you should rely on your ethical intuitions but how to do so." (Pascarella, 1997, p. 44)*

Badaracco argues that a competent manager ought to find ways that do not compromise the respective values. Also, Kidder (2009) emphasizes, with his term of "ethical fitness" designating the importance of being capable to recognize and to manage ethical

[112] The controversial discussion around this aspect is not new; the topic was addressed also by Socrates – who considered the spheres to be separate – and other influencing thinkers. For more details see Kidder (2009).
[113] Insofar, other attitudes towards this holistic view on ethicality can occur in practical contexts.
[114] The existence of the gender-health-gap serves as an example.

dilemmas, this aspect.[115] Insofar, the subject of ethical decision-making is undoubtedly not only a matter of theoretical discourse. The above presented approach is not only useful for individual reflection about ethical dilemmas: Since professional decision-making often takes place in teams, the communicative relevance of guidance is clear. A structured proceeding can support the clear articulation of the concrete dilemma and facilitate further constructive and careful deliberation in the team.

Undoubtedly, organizations have recognized the relevance of ethical questions and the general attention for the topic has grown. But obviously, this did not effectively lead to more ethical behavior. Therefore, Bazerman et al. (2012) investigate the discrepancy between the intentions of theoretical approaches and actual behavior. The authors examine possible roots of unethical behavior and in doing so recognize the limited effectivity of theoretical approaches, since they fail to improve moral conduct:

> *"Ethics interventions have failed and will continue to fail because they are predicated on a false assumption: that individuals recognize an ethical dilemma when it is presented to them. Ethics training presumes that emphasizing the moral components of decisions will inspire executives to choose the moral path. […] Traditional approaches to ethics, and the traditional training methods that have accompanied such approaches, lack an understanding of the unintentional yet predictable cognitive patterns that result in unethical behavior."*
> *(Bazerman et al., 2012, p. 4p.)*

Bazerman et al. (2012) identify ethical inconsistencies between intended and actual behavior which they explain with "our innate psychological responses when faced with an ethical dilemma" (ibid., p. 4). The authors refer in this context to the mentioned *System 1* and *System 2* argumentation of Tversky and Kahneman and reflect on how (unintended) mental processes influence the outcome of ethical decision-making. Thereby, the approach from behavioral ethics aims to reveal the mechanisms that cause the undesired inconsistencies in order to promote awareness and understanding. Finally, these insights can be applied to improve the results of decision-making from an ethical point of view.

The Bounded Ethicality Paradigm

Analogously to the mentioned *bounded rationality paradigm* of Herbert Simon, Bazerman et al. (2012) postulate *bounded ethicality* in human behavior. The observed ethical

[115] Schoeman (2013) summarizes briefly ethical dilemmas in business contexts and provides examples for conflicting legitimate values. This comprises e.g. questions of short-term interests of the employee (bonus payment) in conflict with long-term goals of the company, economic success of the company and conflicting societal/environmental interests or honesty (disclosing information) and loyalty etc.

gap[116] is the result of "psychological processes that lead even good people to engage in ethically questionable behavior that contradicts their own preferred ethics" (ibid., p. 5). Insofar, the concept of bounded ethicality clearly recognizes and highlights the flaws in making adequate, morally correct judgments – even, while being aware of the unethical decision. The authors understand ***bounded ethicality*** as "systematic constraints on our morality that favor our own self-interest at the expense of the interest of others" (ibid., p. 8). With regard to professional decision-making, this aspect requires the consideration of effects on the organizational level as well. Ethical judgment in organizational contexts is influenced by a variety of factors like the structural segmentation of decisions, the delegation of tasks, the functional division of labor, hierarchical structures and the cooperation in teams. Bazerman et al. (2012) clarify that the ethical dimension of the professional context is characterized firstly by the individual's ethical limitations and secondly by the group's ethical limitations. The latter refers to dynamic processes in the team that can influence ethicality. In particular, loyalty, group-think, tensions, self-interests, competition, status and other relations among colleagues can have effects on moral behavior on both the individual and the collective level. That is why, "[a]n organization's ethical gap is more than just the sum of the individual ethical gaps of its employees. Group work, the building block of organizations, creates additional ethical gaps" (ibid., p. 15p). According to the authors' argumentation, ethical education and trainings in the common way cannot be effective, since these methods do not get to the core of the matter, which is not addressed with methodical moral instruction. Therefore, the authors put emphasis on the recognition of the ethical dimension of the decision. This fact is of high relevance, since it determines already from the very beginning the actual ethical issue and in doing so, the orientation for making the *right* choice. Since bounded ethicality reflects both the limited sensitivity for the ethical dimension in decision-making and the effects of unconscious mechanisms, it is crucial to build awareness for these aspects. Similar to other considerations about judgment, Bazerman et al. (2012), discuss the significance of biased thinking and consequentially also biased deciding. They argue, that unintendedly ethically questionable choices can result from bias: this refers to the "cognitive limitations that can make us unaware of the moral implications of our decisions" (ibid., p. 30). Undoubtedly, external factors (e.g. bonuses, pressure, constraints, goals) can have significant influence on practical judgment as well and can lead to ***ethical fading***. This effect describes, that "ethical dimensions are eliminated from a decision" (ibid., p. 31). This can occur also during the decision process when ethical aspects may become seemingly less important over time. Another problematic tendency is associated with the silent, unintended erosion or with conscious bypassing of ethical standards.[117] This refers both to the personal and corporate/organizational level. A solution for dealing with bounded ethicality and its undesired effects is seen in a broad behavioral approach. This view seeks to understand

[116] Bazerman et al. (2012) also diagnose a significant gap between the self-assessment of morality and actual behavior. The authors argue, that the evaluation of the personal ethicality is usually unrealistic and does not meet the person's own ethical standards: "We may predict we will behave in a manner consistent with our expectations for ourselves. But when the time comes to make a decision, we often behave the way we want to behave" (ibid., p. 28).
[117] See Bazerman et al. (2012) for detailed examples.

the root causes of ethical gaps. Therefore, behavioral ethics "emphasizes the need to consider how individuals actually make decisions rather than how they would make decisions in an ideal world" (ibid., p. 34). Analogous to other behavioristic interpretations, Bazerman et al. (2012) investigate the role of flaws and limitations (biased thinking and the effects of constraints) for ethical decision-making. Following Kahneman's proposition of the cognitive *S 1* and *S2*, the perspective on decision-making changes: the distinction between fast, emotional, intuitive, impulsive, effortless *S1* deciding and deliberate, conscious and therefore slower *S2* proceeding reveals that many decisions are not – and cannot be – made in accordance with methodical approaches.[118] In particular, the negative effects of stress, (time) pressure and mental overload on ethicality have to be considered. To sum up: ethicality suffers under pressure. "Not surprisingly, decision making tends to be most ethically compromised when our minds are overloaded" as Bazerman et al. argue. (ibid., p. 34) Further, biased thinking, the selective perception/ignorance of information (ethical blindness) and inadequate self-assessment contribute to the gap in ethicality. As seen, the findings and explanations from the behavioral perspective, link ethicality directly to human behavior and its flaws. Insofar, undoubtedly well-intended regulations, trainings and programs[119] of organizations are bound to fail, when actual behavior – including such aspects like bounded ethicality – is firstly not understood and secondly not managed adequately.

> *"Formal ethics and compliance programs represent only the tip of an organization's 'ethical infrastructure'. Underlying formal systems are informal norms and pressures that exert far more influence on employee behavior than any formal efforts could. […] [B]ehavioral ethics digs deep into organizations: past their formal ethics programs and into the informal systems that teach employees what behavior is <u>really</u> expected of them."*
> *(ibid., p. 103)*

In accordance with the presented behavioral point of view, Bazerman et al. suggest guidance that bases on the outlined assumptions aiming the improvement of ethicality in decisions both in personal and organizational contexts. In other words, *narrowing the ethical gap* effectively is the goal.

[118] Bazerman et al. (2012) underline the (temporal) discrepancy between abstract models and the concrete decision situation: "General principles and attitudes drive our predictions […] Our behavior is driven by details, not abstract principles. […] our motivations aren't the same at […] two points in time" (ibid., p. 68). Insofar, the probably limited value of predictions, models and (compliance) principles regarding ethical aspects has to be considered.

[119] Such programs include often, apart from rules, rewards for ethical behavior and comprise punishment for unethical actions. Bazerman et al. (2012) discuss this common approach and potentially undesired side-effects critically. See Bazerman et al. (ibid., p. 103 pp.) for the detailed argumentation.

Table 9. Advice for improving ethical behavior and decision-making[120]

Recommendations for Improvement	Explanation
Personal change (individual level)	*Creation of **awareness** of ethical deficiencies and negative implications of unethical behavior, Alignment of **"should"** and **"want" selves** (more consistency), **accurate reflection** of decisions/behavior, recognition of susceptibility to biases*
Preparation of the decision	*Appropriate planning for **constraining the "want" self**[121]: realistic anticipation of the influence of the "want" self, practicing of responses for the situation, application of **self-control** strategies, pre-commitment devices to adhere to the desired course of action. Escalation of commitment = public commitment to an intended ethical choice → increases the likelihood of accomplishing the decision as intended*
Decision	*During the decision process: putting higher **emphasis on the "should" self** by focusing on the abstract facts/principles of the decision to resist the temptation for making quickly unethical choices, self-test: imaginary sharing of concrete action with another person, extension of the decision setting: the assessment of all available alternatives → improves decision quality*
Evaluation of the choice	*Accurate **evaluation of unethical choices**: biased self-assessment = incorrect recollection of behavior/decision, reinterpretation of unethical action as ethical → solutions: **debiasing** (training to identify/correct distorted own feedback, emphasis on psychological mechanisms), immediate decision-feedback, **regular debriefing** of decisions (with an advocatus diaboli), **prescribed feedback-mechanisms** in group decision-making (accountability for decisions)*
Organizational change (collective level)	*Requires **audits** of the leaders' decisions/behavior, identification/understanding of **informal values** (organizational talk), **unmistakable articulation** of unethical behavior → intervention; **tailored ethics plan**; attention to **problematic areas** of the organization (uncertainty, time pressure, isolation, short-term horizons) → **catalysts** for ethical fading processes*

[120] In accordance with Bazerman et al. (2012).

[121] The so-called "want" self refers to the strong self-interest which can dominate the actual decision. (This is associated with *S1* activity.) Moral principles are neglected in consequence.

The table summarizes recommendations for achieving improvement regarding ethicality on both the individual and organizational level. As seen, these suggestions are complex and reach beyond the formulation of ethical standards – they require serious reflection and an authentic interest in making good, ethical decisions. The last section included remarks on problematic areas in an organization. As described in other contexts, the quality of decision-making suffers considerably under the influence of constraints like time pressure, stress and uncertainty. These aspects act, according to Bazerman et al. (2012), as catalysts for ethical fading. Insofar, the authors recommend to monitor and to improve such circumstances.

Summary

The briefly outlined perspectives on ethicality in decision-making are heterogenous and critical. However, the aims do not diverge: all approaches undoubtedly seek to improve the quality, integrity and consistency of moral decision-making. That means on the one hand to narrow the *ethical gap* and on the other, to reconcile conflicting values in ethical dilemmas and to achieve reasonable, practical compromises. As mentioned above, the relevance of honest[122] ethical decision-making cannot be underestimated with regard to the reputation, sustainable success and the social role of an organization in a society. Insofar, this genuine self-interest can motivate to articulate ethical concerns seriously. As seen, traditional models of ethical decision-making follow a structured proceeding to approach a morally sound decision. Notwithstanding their value for bringing more clarity about the specific issue into complex ethical dilemmas, their contribution to effectively improve ethical behavior is limited. This holds true also for ethical concepts of organizations. That is why, the field of behavioral ethics approaches the topic differently. Assuming an *ethical gap, ethical fading* and *bounded ethicality*, the solution for organizations is identified less in official frameworks, strict regulations and ethics programs with rewards and sanctions – rather, authentic ethical leadership (leading by example) is key. This requires beforehand a profound understanding of the cognitive mechanisms that influence how ethical choices are made. Additionally, knowing the organization's informal structures and values is indispensable. Of course, this requires firstly sincere interest and secondly also the identification of problematic circumstances of the organization (extraordinary stress, time pressure or the isolation of colleagues etc.). Being aware of the limitations of the human mind, ways to improve individual behavior are seen in debiasing, accurate self-reflection, training for enhanced ethical awareness and the general motivation to work on improvement. Experience in solving ethical questions builds intuition, which is crucial for making sound choices, when time is limited and the pressure is high. Insofar, ethically consistent attitudes and developed intuition can contribute to making better decisions. From an ethical perspective, a *good* decision is a choice that is made in accordance with essential moral values and ethical standards. Insofar, ethical decision-making is relative by nature and the measures can change dynamically over time as well.

[122] Bazerman et al. (2012), Kidder (2009), Badaracco and others criticize hypocrisy in ethical matters and insist on consistent, realistic and honest attitudes concerning morality.

4 Influences on decision-making

4.1 The concept of nudging

In analogy to the considerations of the preceding sections, Thaler et al. (2021) follow the assumption that decisions are neither made in ideal circumstances, nor by ideal deciders as reflected in the rational perspective.[123] That is why, the authors follow a libertarian paternalistic approach that recognizes and addresses the features of human nature – in both, positive and negative sense – adequately, because "[c]hoosers are human, so designers should make life as easy as possible" (Thaler et al., 2021, p. 18). The recommendation refers to the general design of decision architectures. Also, here the overall aim is to improve judgment and to facilitate *good* decisions by making the process convenient and as I suggest to name it: *decider-friendly*.[124] Therefore, the authors plead for a more or less slight ***nudge*** towards a good choice. Making choices easier or even effortless, can effectively contribute to making good choices.[125] Therefore, the insights from Csikszentmihalyi (2001, 2021) about reaching a state of flow, is also relevant for the present context.

The implementation of nudges applies both to private (e.g. as a consumer, patient) and institutional or even governmental decisions.[126] Thereby, nudging represents a consciously planned attempt to influence and to move people in an intended, *positive* direction, whereby, the final choice is explicitly made *voluntarily*:[127]

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[123] Regarding human fallibility and susceptibility, Thaler et al. (2021) argue that "[…] choices […] are influenced in ways that would not be anticipated in a standard economic framework" (Thaler et al., 2021, p. 46). These influences comprise, heuristics, biases, effects of stressors and manifold constraints. Often, limited attention, distraction and inertia have considerable impact.

[124] See also Csikszentmihalyi (2001, 2021) for more details about the relevance of achieving flow. This aspect was also discussed with reference to practical decision-making at the EDSI Conference 06/2024 (Venice).

[125] This argument relates also to overcoming apathy or inertia to decide. This includes phenomena like decision paralysis or postponing important choices as well.

[126] See Thaler et al. (2021): The authors provide a plethora of examples from different settings. This comprises among others private consumer decisions, organizational choices and also decision-making on societal, political or governmental levels. The authors explain, that "[…] governments around the world […] have incorporated these and related ideas in an effort to make their programs more efficient and effective. There are numerous behavioral insights teams or nudge of various kinds in numerous nations […] A great deal of relevant work is being done by the World Bank, the United Nations, and the European Commission. In 2020, the [WHO] created a Behavioral Insights Initiative focusing on numerous public health issues, including pandemics, vaccination uptake, and risk-taking by young people" (ibid., p. 19p). See also Thaler (2015) for details about the application of nudging principles.

[127] "The concept of nudging is based on the notion that people do not make good decisions *in terms of their own preferences* and, therefore, fail to maximize their utility […] What this means is that our 'revealed preferences' do not reflect our *true* preferences […]" (Corr et al., 2019, p. 151)

"A nudge […] is any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid." (Thaler et al., 2021, p. 8)

Thaler et al. (2021) identify the following circumstances[128] where nudging can generally support, guide or accelerate the decision-making process:

1) *Limited mental capacity: The decision requires scarce attention. (due to other tasks, distractions, time pressure etc.)*
2) *Degree of difficulty of the choice: The decision cannot be made easily due to its complexity (e.g. ethical dilemma), uncertainty or unclear information.*
3) *Temporal discrepancy: delayed effects – benefit now/costs later, preference for instant gratification, incorrect assessment of the choice's consequences.*
4) *No immediate feedback after the choice: delayed, and thereby limited, opportunity for learning from the decision.*
5) *Frequency of the decision: insufficient experience, rare, unfamiliar situations, difficulties in understanding the situation.*
6) *Unclear preferences: concerning new, rare, unfamiliar or unclear choices dur to the lack of experience.*

In accordance with the mentioned factors, the authors conclude respectively:

"[P]eople make good choices in contexts in which they have lots of experience, good information, and prompt feedback […]" (ibid., p. 13)

The approach of nudging is unmistakably not intended to patronize or to treat people in an authoritative manner.[129] Rather, the decision architecture is intended to influence decision behavior implicitly. The implicit proceeding is partially criticized in the literature as manipulative. The authors disagree in this aspect and recommend being transparent when nudging is part of a broader decision architecture. Nowadays, nudging principles are applied in manifold contexts. This applies to influencing consumer decisions, enhancing motivation to vote in political elections or giving subtle nudges to foster the protection of the environment etc. The strength of nudging is its more implicit and non-authoritative appearance, that does not lead to immediate rejection. Rather, nudges support desired behavior – with individual, good choices resulting in positive effects on a broader level as well.[130]

[128] ibid., p.91.
[129] The authors explicitly do not include taxes or fines in their definition, since these cannot be avoided. (ibid., p. 18)
[130] Thaler et al. (2021) provide examples like: nudging in the context of health (wholesome nutrition), ethical behavior, protection of the environment etc. Individual good decisions can create positive effects on the societal level.

"If you want to encourage some behavior, figure out why people aren't I doing already, and eliminate the barriers that are standing in their way." (ibid., p. 151)

The considerations showed that nudges represent relatively inexpensive interventions, but with considerable potential for change. A particular advantage is the indirect manner of influencing, since direct reactance is avoided. Nudges are capable of relieving memory, reducing complexity and even to give impulses to resolve essential matters.[131] The latter refers to the ongoing discussion (e.g. in Germany) regarding organ donation after death, where principles of nudging have also become part of the decision architecture. Organ donation rates are considered to be too low in relation to the required organs or tissues. The standpoints, approaches and regulations in this ethically difficult matter are heterogenous and differ among countries. The following general types of EU *Consent Systems for organ donation* exist according to BZgA (2024) and the European Parliament (2020)[132]:

1) *Opt-out (presumed consent, silence being tantamount to consent) requires before death the explicit request not to remove organs → Sludge?*
2) *Opt-in (explicit/informed consent solution) requires active, explicit consent, e.g. via registration → Nudging?*
3) *Mixed system (registration of individual wish) development of donor and non-donor registries → Nudging?*

The concrete way, how the individual decision concerning deceased donation is achieved and (silently) declared, is a topic of political, societal and religious controversial debates. The opt-in solution requires an active, unequivocal statement before death. Following the opt-in rule – in order to increase the donation rates – the question about the legitimate application of political nudging (public information campaigns, distribution of organ donor cards, recurring enquiries regarding consent) arises. The opt-out solution is characterized by passivity of the potential donors, because an objection has to be entered actively. Depending on how convenient it is to disagree, conscious barriers could be assumed in order to attain higher rates of participation in organ donation. A proceeding with intentionally created barriers could then be identified as the negative counterpart of a nudge, *sludge*. In the case of mixed options, nudging could be applied

[131] In medical contexts, nudges e.g. improve the medication adherence of patients. Checklists also represent nudges, since they relieve the memory, initiate steps, avoid the omission of steps, prevent post-completion errors and encourage staff by design to speak up. The last argument relates in particular to the collaborative intention of the WHO Safe Surgery Checklist. These remarks are also valid for aviation checklist application.
Additionally, electronic reminders (from wearables etc.), unmistakable constructions, reduced standard options and carefully preselected, good default options are valuable nudges. (See also the individual sections about medical and aeronautical decision-making of the present work for more details.)

[132] "In practice, operational variants exist, as the family of the deceased still plays a prominent role in the decision-making." (European Parliament, 2020, p. 4)

to inform and to motivate people at least to consider – or even to opt-in for organ donation. The core question of all models is *informed consent* and how to achieve it. Regardless of the preference for an individual model, sound information is an essential prerequisite for deciding competently upon this difficile question. Insofar, indispensable public education and open discourse can have nudging effects. Even if the efforts of public education might not lead immediately to an increase of donations, the creation of societal awareness for the topic is not less important, since information can pave the way to a personal opinion and consequently to *informed* decision-making – regardless of the concrete result. The European Parliament evaluates findings about the regulations about organ donation as follows:

> *"The authors [of a commissioned study] suggest that 'other barriers to organ donation must be addressed, even in settings where consent for donation is presumed', and conclude that 'greater emphasis on education and informing […] about the benefits of transplantation is the preferred way to achieve an increase in organ donation'. In this context, a 2016 commentary looks at whether the concept of 'nudging' deceased donation through an opt-out system constitutes a libertarian approach or manipulation." (European Parliament, 2020, p. 4)*

Thaler et al. (2021) discuss the topic of organ donation and clarify that "[i]n the context of organ donations, we do advocate something close to the active choice model. We prefer prompted choice to required choice […]" (Thaler et al., 2021, p. 319). The raised objection against nudges with the argument of being manipulative[133], is replied by the authors clearly:

> *"[A]n action counts as manipulative if it does not adequately respect people's capacity for rational deliberation. On this criterion, most nudges are not manipulative." (ibid., p. 325)*

The authors emphasize as well the requirement of complete transparency. This refers among others to default rules or automatic enrollments, like in the case of an opt-out organ donation proceeding. In other cases, the authors call upon common sense (instead of naïveté) in order to recognize possible nudging and to act according to the personal choice. In sum, "nudges maintain freedom of choice" (ibid., p. 318).

The opposite pole of nudging is, according to Thaler et al. (2021), the not less important phenomenon of so-called ***sludge***. The term is used to describe barriers and frictions, and means concretely

[133] A negative example, that indeed follows manipulative interests is the phenomenon of "dark patterns". The OECD explains that "[d]ark commercial patterns are digital practices that subvert consumers' decision-making through the ways in which choices are presented to them. [T]hey can steer, deceive, coerce, or manipulate consumers into making decisions against their best interest" (OECD, 2022).

"[…] any aspect of choice architecture consisting of friction that makes it harder for people to obtain an outcome that will make them better off […]" (ibid., p. 153).

This refers to obstacles, hindering impulses or other measures. The principle of sludge applies, "if you want to discourage some behavior, make it harder by creating barriers" (ibid., p. 151). Sludge is consciously intended to make things more complicated and inconvenient. Undoubtedly, sludge can also result from unintended action, like from growing complexity, that is not primarily intended to produce obstacles. With regard to bureaucratic processes, complicated, non-transparent or inconsistent procedures obviously represent sludge.[134] This holds true for the consumer sector as well, when closing a contract is comparably easy (because of nudges), but ending the respective contract is made far more difficult and time-consuming. Insofar, both sides are of importance for understanding, influencing and directing decision-making.

In **conclusion**, the briefly outlined concept of nudging bases on common, undisputed behaviorist insights. The effectivity of the approach is rooted in the recognition, interpretation and sound understanding of observable tendencies when people are confronted with making choices. The considerations of Thaler et al. (2021) emphasized in particular, human limitations[135], high relevance/importance, complexity and difficulty of the matter as connecting points for the integration of nudging into the decision architecture. The opposite phenomenon of sludge describes barriers, frictions and difficulties that are capable to hinder reaching a desired outcome or to come to an intended decision. As seen, both phenomena can be observed on private, organizational and societal levels. The recognition of opportunities to reduce undesired sludge and to increase beneficial outcomes with the application of nudges can lead to better decision quality. The presented example of deceased donation illustrated that the application of nudging principles, particularly in critical contexts, is not undisputed.

[134] An illustrative example of sludge in the name of security are the worldwide common security checks at airports. The authors identify the waiting time as sludge and argue that "the worldwide costs of airline security checks are underestimated because they are not monetized, which is often the case for sludge. [T]he costs governments impose on their citizens via sludge are often neglected in the design and evaluation of politics" (ibid., p. 169).

[135] Marginal note: Regarding the limited human (cognitive) capacities, Thaler et al. (2021) emphasize the relevance of taking ***conscious breaks*** during the decision process in order to improve the decision quality. The recommendation of taking a conscious pause is also part of the so-called FOR—DEC routine for decision-making in aviation. (See also the section about aeronautical decision-making included in the present work.)
Choudhury et al. (2024) examine the causes of ***decision fatigue*** and derive eight key factors that have adverse effects on the decision-quality. Among them are also the duration, complexity, and the availability of breaks. These mentioned eight factors relate also to the above mentioned six preconditions for effective nudging according to Thaler et al. (2021).

4.2 Cultural influences on decision-making

Professional decision-making can also be interpreted as culturally embedded and influenced, purpose-oriented communicative practices. Decision processes, that take place in organizational contexts, comprise a multitude of diverse communicative activities. These activities have considerable influence on the entire process: approaching a decision can be facilitated, accelerated, interrupted, hindered or terminated through communication. Insofar, the process of negotiating a decision can be understood as complex verbal and non-verbal doing.
The considerations in the preceding sections focused predominantly on procedural aspects and contained more or less rigid routines for approaching decisions in a systematic manner. Since, decision-making involves communicative interaction in all its stages, this component cannot be underestimated for attaining good decisions. In addition, the involved persons bring their individual and cultural (communicative) diversity. Appreciation and respect for both are essential, as Meyer (2015) argues, in order to cooperate successfully. In other words, the participants of the communicative decision process do not only contribute to it with ideas, knowledge and professional problem solving techniques, they also perceive and influence it (unconsciously) with their cultural perspective and individual personality. There are, as Trompenaars et al. argue, "visible and invisible ways in which culture impacts on organizations" (Trompenaars et al., 2020, p. 7). Insofar, informed decision-making means in this context being prepared and aware of relevant cross-cultural parameters that might have an influence.

> *"The more fundamental differences in culture and their effects may not be measurable by objective criteria, but they will certainly play a very important role in the success of an international organization." (Trompenaars et al., 2020, p. 7)*

> *"Cultural patterns of behavior and belief frequently impact our perceptions (what we see), cognitions (what we think), and actions (what we do)." (Meyer, 2015, p. 14)*

The term of ***culture*** is defined in the literature in different ways.[136] Hofstede treats

> *"culture as the collective programming of the mind that distinguishes the members of one group or category of people from another. […] The 'mind' stands for the head, heart, and hands – that is, for thinking, feeling and acting, with consequences for beliefs, attitudes, and skills." (Hofstede, 2001, p. 9).*

[136] Hofstede refers to the following anthropological definition of Kluckhohn (1951) and derives his definition respectively: *"Culture consists in patterned ways of thinking, feeling and reacting, acquired and transmitted mainly in symbols, constituting the distinctive achievements of human groups, including their embodiments in artifacts; the essential core of culture consists of traditional (i.e. historically derived and selected) ideas and especially their attached values"* (Kluckhohn in: Hofstede, 2001, p. 9).

Lewis (2018) interprets Trompenaars' expression of *collective programming* as a mental "process to which each one of us has been subjected since birth" (Lewis, 2018, p. 15). The mentioned definition implies the considerable complexity of the phenomenon. The discussion in the literature is in general aspects reflected in a model that clarifies essential interdependencies. This model differentiates between three layers of culture and visualizes them accordingly with three concentric circles.[137]

1) *Core: essential assumptions (implicit, accepted and almost unquestioned)*
2) *Middle: norms (formal and informal) and values*
3) *Surface: perceivable, recognizable (language, architecture etc.)*

The center of the circles represents *(1)* implicit basic assumptions (essential "routine answers to the environment"), *(2)* the middle layer stands for norms and values, and *(3)* the outer layer is seen as the explicit, observable reality of artifacts and products of a culture. These layers are complementary.

In sum, Trompenaars et al. (2020) state that "[c]ulture is man-made, confirmed by others, conventionalized, and passed on" (Trompenaars et al., 2020, p. 31). This argument underlines the stability of cultures, that becomes visible both in traditions and in common stereotypes. The visible, explicit part – the outer circle – mirrors the underlying norms and values of a group. A significant part of cultural stability is derived from the middle layer. Thereby, the ***norms*** express *what is right or wrong*. They can appear formally binding as written law or informally as social control. ***Values*** stand for *what is good or bad* and represent the mutual aspirations and ideals of a group. Trompenaars et al. (2020) argue that a "culture is relatively stable when the norms reflect the values of the group. […] It takes stable and salient shared meanings of norms and values for a group's cultural tradition to be developed and elaborated" (ibid., p. 29 p). A stable culture does not only serve internally for the group members as a reference point. From an external point of view, the respective culture can also be identified. For the given context this is relevant in order to facilitate cultural awareness and mutual understanding.

On the basis of the briefly outlined concept of culture, the authors derive ***cultural dimensions***. Depending on the authors, these dimensions comprise from five to eight categories, whereby different emphasis is put on some of their characteristics. In an ensuing step, scales for the criteria are derived in order to create a basis for comparative interpretation. The positions of countries on the scales indicate specific patterns and clusters. The approaches from Meyer (2015), Hofstede (2001) and Trompenaars et al. (2020) show, besides their parallels, some differences regarding the (number of) identified dimensions. This variation is of interest, since it covers in sum more cultural parameters.

[137] See Trompenaars et al. (2020, p. 29), Hofstede (2001, p. 11) and Lewis (2018, passim).

Meyer (2015) discusses the topic of cross-cultural communication based on the results of field-research and accumulated practical experience. Thereby, eight cultural dimensions are identified and visualized as individual scales. These derived essential dimensions – like the perception of time, politeness, hierarchy, trust etc. – represent specific attitudes/patterns and have fundamental influence on intercultural communication. Insofar, these dimensions can be interpreted as *basic reference cultural norms*. (Trompenaars et al., 2020, p. 2) Meyer (2015) assigns national positions on the scales regarding the individual dimension. The specific position on the scale is a general indicator for a tendency and helps to identify differences in an elementary manner. Hereby, *not* the absolute position is of practical relevance.[138] It is more the relative difference that matters. The comparative perspective allows in consequence to draw practical conclusions for enhancing cross-cultural exchange. Thereby, the overall aim is to create awareness for the cultural specifics in order to manage them respectfully and professionally. Trompenaars et al. (2020) clarify the diverging perception of similar concepts depending on the cultural background. The authors argue that these specifics cannot be translated easily, and therefore cross-cultural collaboration requires both the interest and the effort of gaining an understanding of the broader, indeed complex framework.

> *"In every culture in the world such phenomena as authority, bureaucracy, creativity, good fellowship, verification, and accountability are experienced in different ways. That we use the same words to describe them tends to make us unaware that our cultural biases and accustomed conduct may not be appropriate or shared." (Trompenaars et al., 2020, p. 3p)*

The influence of the cultural dimension becomes often apparent when persons from different countries cooperate in (remote) teams, when negotiations involve partners from different countries – and, when even with best intentions and adequate behavior of the involved, the cooperation does not work out as smoothly as expected and diffuse misunderstandings occur.[139] In such cases, it is worthwhile to investigate the cultural framework of the case (beforehand) in order to detect and to understand the possible causes of the undesired frictions.[140] – Among others, the following aspects are closely related to communicative activities in decision processes: all of them can unconsciously be influenced by heterogenous cultural backgrounds of the involved persons.

- *Verbalization of perceptions, understanding of the issue (problem statement), confirmation of mutual understanding, consent, clarifications*
- *Verbal management of ambiguity, uncertainty, misunderstandings*
- *Presentation and discussion of solutions/ideas (meetings)*
- *Negotiation of priorities, discussion of alternatives/options*

[138] See: Meyer (2015), p. 18 passim.
[139] Even with experienced international companies, many well-intended ‚universal' applications of management theory have turned out badly." (Trompenaars et al., 2020, p. 3)
[140] Meyer (2015) provides a multitude of examples and concrete solutions for such situations.

- *Articulation of criticism, doubt, agreement, humor etc.*
- *Dispute, achieving a compromise/consensus, convincing*
- *Communicative influences (framing, thematic focus, omission of facts)*
- *Verbal/non-verbal means (silence, gestures, seating arrangement)*
- *Channel of communication (face-to-face, telephone, written form)*
- *Communicative style (authoritative, egalitarian, friendly, hesitant)*
- *Disturbances (noise, interruption, distraction, changing participants)*
- *Language barriers (foreign language, and if yes: level of proficiency)*
- *Motivation (praise, bonuses, avoidance of negative feedback)*
- *Declaration of the decision (verbal commitment, announcement, contract)*
- *Delegation of tasks (time, hierarchy, control, leadership)*
- *Internal communication: team, organization (hierarchies)*
- *External communication: stakeholders, public (media)*

This brief overview illustrates the obvious complexity of the process, its flexibility and the existence of influenceable/vulnerable factors. Of course, besides the cultural parameters, the individual personality and attitudes towards these cultural dimensions are of relevance. [141]

The following tabular overview summarizes the assumed eight cultural dimensions of Meyer (2015) and the derived scales, whereby the characteristics represent both poles respectively. As mentioned before, the *relative* positions and the specific gap between interacting parties are of relevance, not their absolute positions. Knowing and understanding the own and the perspective of the partner(s) in a professional manner, may help to anticipate differences and to prevent avoidable frictions and obstacles in approaching decisions.[142] This does not only require focus on the other cultures, but on the own cultural background as well.

[141] Meyer (2015) argues that the scales and national positions represent generalizations and are intended to give orientation. The characteristics of an individual person might not equal the assumed prototypical example.

[142] As Meyer (2015) explains, these frictions cannot be underestimated in negotiations or cooperation. Resolving conflicts or misunderstandings is time-consuming. Therefore, it is of significant value to develop intercultural competence in order to be aware of existing differences and to manage them adequately.

Table 10. Eight cultural dimensions/scales (Meyer, 2015)[143]

	Cultural Dimension	Scales and Explanation
1.	**Communication** (implicit/explicit)	***low context – high context*** *low context: precise communication, avoidance of ambiguity high context: nuanced, implicit communication in rich context*
2.	**Evaluation/Politeness** (loss of face)	***direct negative feedback – indirect negative feedback*** *direct: frankly, not softened, also coram publico possible indirect: discreetly in private, subtly, positive descriptions*
3.	**Persuasion** (general approach)	***principles-first/deductive – applications-first/inductive*** *principles first: theoretical/conceptual basis of arguments applications first: less theoretical, more practical approach*
4.	**Leadership style** (organizational structure/philosophy)	***egalitarian – hierarchical*** *egalitarian: flat organizational and communicative structures hierarchical: multilayered, fixed structures, relevance of status*
5.	**Decision-making** (power to decide)	***consensual – top-down*** *consensual: decisions achieved in groups, agreement top-down: made by individuals, higher level*
6.	**Building of trust** (relevance of personal connection)	***task-based – relationship-based trust-building*** *task-based: work-related activities, quality/reliability of work relationship-based: sharing of personal time (slower)*
7.	**Disagreement** (loss of face/harmony)	***confrontational – avoidance of confrontation*** *confrontational: disagreement/debate = positive/appropriate for the group, valued, no negative impact on relationship avoidance: disagreement/debate = inappropriate, negative impact on group harmony or relationship*
8.	**Scheduling** (deadline)	***linear-time – flexible time*** *linear time: sequential proceeding, focus on schedule flexible time: fluid proceeding, focus on flexibility/adaptability*

"Cultural awareness […] is understanding states of mind, your own and those of people you meet. You can never be fully informed, since there is an infinite range of potential errors, but our […] dimensions of culture provide us with a frame of reference for analyzing ways in which people attribute meaning to the world around them." (Trompenaars et al., 2020, p. 280)

[143] According to Meyer (2015, p. 17 passim).

Trompenaars et al. (2020) assume seven relational orientations that reflect the nature of interactions and thereby represent ***dimensions of culture***.[144] These categories differ in some aspects from the mentioned dimensions in Meyer's concept. But similarly, a comparative perspective is taken in order to detect and understand relevant national differences.[145] The authors explain their perspective as follows:

> *"Every culture distinguishes itself from others by the specific solutions is chooses to certain problems that reveal themselves as dilemmas. It is convenient to look at these problems under three headings: those that arise from our relationships with other people; those that come from the passage of time; and that which relate to the environment" (ibid., p. 9)*

The following table provides an overview of the assumed cultural dimensions.[146] Five of them are associated – and thereby mirror the high relevance – to the topic of interpersonal relationships. This includes the perception of the individual role, how a person is judged by others and the relation to a group or society. This involves also essential questions about how collaboration is established. In more task-oriented (specific) cases, professional focus is primarily put on the concrete solution/decision, whereas in diffuse contexts, a mutual basis is a precondition for cooperation. The question of appropriateness to express emotions in professional settings belongs to these dimensions as well. The last categories comprise the perception of time and the relation to the surrounding world. These cultural dimensions have significant communicative and practical consequences for mutual understanding, cooperation and decision-making. Therefore, it is inevitable to attain cultural awareness, and competence. The authors conclude that the "internationalization of business life requires more knowledge of cultural patterns" (ibid., p. 5). A multitude of existing management theories has their origin in the USA, but are intended to be applied universally. Trompenaars et al. (2020) have doubt in the unadjusted transfer of methods, since essential positions and fundamental world views might differ considerably depending on the involved countries.

> *"We have our Western approach, based on American business education, which treats management as a profession and regards emotionally detached rationality as 'scientifically' necessary. This numerical, cerebral approach dominates not only American business schools. […] The mistake is to assume that technical rationality should characterize the human element in the organization. […] [This] is a cultural, not scientific belief." (ibid., p. 5)*

[144] The presented considerations of Meyer (2015) refer also to the findings of Trompenaars and Hofstede.
[145] The authors also depict the respective positions utilizing scales.
[146] For detailed and concrete examples from business contexts also see Trompenaars et al. (2020).

Table 11. Seven cultural dimensions (Trompenaars et al., 2020)[147]

	Cultural Dimension	Explanation
	*The dimensions **1-5** refer to the relations with other people.*	
1.	**Universalism vs. particularism**	*Universalist approach: assumption and hence application of one definite good/right way* *Particularistic approach: more attention to obligations of relations and specific circumstances, less attention given to abstract societal rules*
2.	**Individualism vs. communitarianism**	*Depending on self-perception: primarily as an individual or as a member of a group (perspectives: community or individual first; direction of contribution)*
3.	**Neutral vs. emotional**	*Degree of (visible) emotional involvement* *Neutral: instrumental, efficient, task-oriented relations, detached, inappropriate to express emotions* *Emotional: expression of emotions appropriate, building of personal relations (business = human affair)*
4.	**Specific vs. diffuse**	*Specific: interpersonal relation is mainly related to the concrete task/project/contract* *Diffuse relation: personal relation/trust-building are often a necessity for establishing successfully a cooperation (sound relation first – task/contract can follow)*
5.	**Achievement vs. ascription**	*Achievement: person is judged by accomplishments (reliability due to success) and status attributed to criteria like academic degree (university/prestige), projects etc.* *Ascription: status is attributed to criteria like birth, kinship, gender, age, personal connections, academic record (university/prestige) etc.*
6.	**Attitudes with regard to time**	*perception of time and time-horizons (sequential/synchronic organization of activities), relevance of past achievements or future plans (consequences for planning, strategy, investments and education)* *perception as a linear flow of time (sequence/process with disparate events)* *perception as a circle of past, present and future*
7.	**Attitudes with regard to the environment**	*Relation of the individual role and its environment/society (perception of own role, interaction with the social environment, control over circumstances, harmony)*

Apart from a limited number of countries, the majority of management models does not adequately correspond to the illustrated cultural diversity. This would rather require an appropriate intersecting set of cultural similarities. This aspect is not only of relevance

[147] According to Trompenaars et al. (2020).

for geographically distant countries: with regard to Europe and America, the authors identify a considerable amount of differences, even in neighboring regions or countries.

> *"[T]here is a clear-cut cultural border between the northwest European (analysis, logic, systems, and rationality) and the Euro-Latin (more person-related, more use of intuition and sensitivity)." (ibid., p. 9)*

The utilitarian, rigid rule-based way of thinking that is part of many methods, is obviously not adequate for all cross-cultural contexts. That does not the reduce the particular value of a concept at all. According to the proverbial expression *to fit the terrain into the map*, the authors recommend, instead on insisting on adherence to the own perspective, to manage the case with flexibility, creativity and openness.[148]

Hofstede (2001) proposes a concept that is also based on extensive empirical research. He distinguishes between five essential cultural dimensions, that differ in some regards from the before mentioned models.

1) *Power distance*
2) *Uncertainty avoidance*
3) *Individualism and collectivism*
4) *Masculinity and femininity*
5) *Long- and short-term orientation*

These categories reflect similarly essential aspects of human life and societal organization. The first cultural dimension reflects human inequality that is perceivable in hierarchies: in the power over subordinates and to delegate. The second dimension can be interpreted in a wide sense. Uncertainty avoidance is understood as the way people deal with the normal uncertainty of life and an uncertain future.[149] According to Hofstede (2001) this can be associated with factors that convey the impression of stability like religion, customs, traditions, a stable society (family), reliable institutions etc. The third dimension refers, like in both other models too, to the relation between an individual and a group. This includes also the culturally different perceptions of individualism and collectivism as sources of personal or societal well-being. The dimension of masculinity and femininity can be interpreted in a broader sense, as well. Obviously, the derived conclusions and attributions with regard to gender are critically assessed and partly subject to change in some parts of the world. The fifth dimension can also be associated with the second dimension of uncertainty avoidance: It refers to time-horizons, planning and the general relation to passing time. The following table summarizes the five dimensions.

[148] Meyer (2015), Lewis (2018) and Trompenaars et al. (2020) provide manifold practical examples of cases where insufficient flexibility, ignorance or naïveté led to avoidable grave misunderstandings and failed negotiations.
[149] Uncertainty avoidance does not equal risk avoidance.

Table 12. Five cultural dimensions (Hofstede, 2001)

	Cultural Dimension	Explanation
1.	**Power distance**	*Reflects the degree of human inequality in interpersonal relationships (hierarchy): "Power distance is a measure of the interpersonal power or influence [...] perceived by the less powerful [...]" (ibid., p. 83)*
2.	**Uncertainty avoidance**	*Refers to ways of cultural management of the uncertain future (religion, laws, planning horizons, rules as stabilizing instruments)*
3.	**Individualism and collectivism**	*Describes the "relationship between the individual and the collectivity that prevails in a given society" (ibid., p. 209). (different degrees of individualism, different cultural perspectives on the dimensions)*
4.	**Masculinity and femininity**	*"The duality of the sexes is a fundamental fact with which different societies cope in different ways; the issue is what implications the biological differences between the sexes should have for the emotional and societal roles of the genders." (ibid., p. 279)*
5.	**Long- vs. short-term orientation**	*"Long Term Orientation stands for the fostering of virtues oriented towards future rewards, in particular, perseverance and thrift. Its opposite pole, Short Term Orientation, stands for the fostering of virtues related to the past and present, in particular respect for tradition, preservation of 'face' and fulfilling social obligations" (ibid., p. 359)*

The derived cultural dimensions from any of the three presented concepts reflect the status of essential societal interrelations at a certain point in time. Societal change may influence these and also the national scalar positions over time. Insofar, it is worthwhile to monitor societal developments in order to keep pace with changing parameters.[150] According to the model of cultural layers, it probably takes time to create change that percolates through society and reaches the center of the circles. But, the surface of the outer layer can indeed indicate beginning changes.

The presentation of the three approaches aimed to provide an impression of the complexity of possible cultural influences on cross-cultural cooperation. Of relevance is, as mentioned before, the relative cultural distance between the involved parties. In consequence, this requires also a (self-critical) reflection of the own cultural background and related existing cultural biases.[151] This does not imply a qualitative assessment, rather a position determination.

[150] This relates among others to generation changes, evaluation of existing (ethical) values and the impact of external factors (like technological progress, political decisions, environmental change, conflicts and migration etc.) that influence societies.
[151] Meyer (2015) remarks that the own cultural background is often not consciously perceived.

To sum-up, for approaching decisions in international settings, the following factors are, among others, of relevance. According to the literature, differences can be observed regarding:

1) *time: planning horizons, short- and long-term perspectives, scheduling flexibility, time consumption of the decision process*[152]
2) *allocation of the power to decide: authority, delegation of the decision, relevance of prior consultations and internal approval*
3) *process: communitarian or individualistic decision-making, speed and stringency of the process*
4) *relevance of personal relationship: trust building, sharing of time*
5) *stability of the choice: different attitudes towards stability, amendments, corrections of the decision*[153]

The cultural specifics have a considerable influence on the success of decision-making, and the examples in the literature confirm the relevance of intercultural competence for effective cooperation.

> *"The world of business is changing ever more rapidly due to the internationalization of business and migration of people […] Yet we still observe that the major instruments and methods […] owe their origins to an Anglo-Saxon philosophy and are still dominated by an Anglo-Saxon or US signature."*
> *(Trompenaars et al., 2020, p. 177)*

Insofar, adapted approaches that consider the cultural diversity adequately – and not as a side issue – could represent an effective improvement. Meyer (2015) recommends also being transparent in cross-cultural settings, since clarity about the personal approach and the reasons behind it, can prevent misunderstandings at an early stage in the contact. Specific trainings and cultural education are often provided for international managers, but meanwhile, many professional contexts are influenced by the mentioned internationalization. Culturally diverse and remote international teams, perceived digital proximity and the effects of globalization are conditions that require cultural awareness and knowledge on many levels for good cooperation.

[152] Trompenaars et al. (2020) explain that the „Japanese *ringi* process, where proposals circulate and are initiated by agreeing participants, is the most famous example of communitarian decision-making, but it can lead to very lengthy delays "(Trompenaars et al., 2020, p. 75).
[153] "Saving time in decision-making is often followed by significant delays due to implementation problems. […] In individualistic societies there is frequently disparity between decision and implementation." (ibid., p. 75)

4.3 Chapter summary – Theoretical approaches of decision-making

The chapter was dedicated to the presentation and discussion of various models for decision-making. In doing so, a theoretical background for the practical considerations in the next chapters is created. The chapter based on the critical review of the literature about judgment and deciding. Hereby, the thematic scope consciously comprised approaches which diverge significantly both in their core assumptions and conclusions. The different perspectives on approaching decisions reflected the complex nature and unwavering relevance of the topic.

The presentation of the essential assumptions of **rational decision-making** served as a point of reference for the subsequent considerations. The discourse in the literature is similarly oriented on the concept of rationality, and differences are often sought in the light of this idea. The discussion around the imagined *homo oeconomicus* and the supposed rational behavior, revealed the existence of unrealistic assumptions. The theory of *bounded rationality* sheds a far more realistic light on how decision are made, since it acknowledges the limitations of human deciders. The subsequent presentation of the *"rational manager"* concept of Kepner and Tregoe aimed to demonstrate the practical side of professional deciding under the premise of rationality. The holistic, utilitarian approach is centered around a complex set of rule-based processes in order to support managers in solving their tasks in a correct and rational manner. The component of decision analysis is intended to ensure a robust decision. The quality of a *good* decision is related to being *workable*. Aspects like intuition play only a marginal role in this concept.

The views of **behavioral economics** and **naturalistic decision-making** stand in stark contrast to the assumptions of the rational paradigm. The *naturalistic perspective* is oriented on investigating how decisions are made in their natural context. A central assumption of the concept is the significance of effective pattern-recognition in the process of making choices. The value of professional intuition is emphasized as well. The *heuristics and biases paradigm* bases on a set of assumptions including bounded rationality, the fallibility and susceptibility of deciders and on the conceptual imagination of the different *Systems 1 and 2* and their specific capabilities. Of particular importance in the discussion were the disputed roles of heuristics and biases in the context of decision-making. With regard to the distant positions of rational decision-making and the more behavioristic oriented approaches, a position, aiming to reconcile both directions, exists as well. A *good* decision is associated with the idea of *satisficing*.

The **ethical dimension** of decision-making was examined with focus on solving ethical dilemmas with a traditional approach, and on how behavioral ethics seek to improve ethicality of individuals and organizations. Apart from the significant differences of the outlined approaches, the relevance of moral consistency in making judgments is undisputed in the literature. The behavioristic discussion included considerations about phenomena like the *ethical gap*, *ethical fading* and *bounded ethicality*. Thereby,

emphasis was put on the individual contribution to ensure ethicality. Practical recommendations for improvement of ethicality concluded the section.

The considerations revealed, that the aspect of ethicality finds rarely explicit recognition in decision models or methods. Since, models are used for professional training purposes, reasonable adjustments could increase awareness for ethical concerns. Also, with regard to building ethical intuition – which is particularly crucial for (ethical) decisions under time pressure – more attention for this topic is undoubtedly required. Specific focus is also necessary in this context on the management of stressors and constraints, because ethicality and decision-quality in general are bound to suffer significantly in consequence. Gaining experience in order to build professional, ethical intuition over time, is – due to the flaws of human nature – associated with the possibility of making errors. Insofar, the implementation of an adequate culture of failure, that encourages learning from mistakes, is recommended.

Decision-making can be influenced in manifold ways. Therefore, two sections focused primarily on the effects of the **cultural context** and on **nudging**. The application of nudging principles represents an effective, but inexpensive and efficient method for influencing behavior – and judgment – through indirect, conscious impulses. The overall intention of nudging is to facilitate good and informed decisions. Thereby, focus is directed on implicitly influencing the decider. Nudging takes place on various levels and can be utilized for manifold purposes, whereby the contexts comprise personal, organizational and even societal, governmental matters. Thereby, the subtle proceeding evades prompt negative responses and rejection. Barriers and difficulties, so-called sludge, are perceived as the opposite part of nudging. Nowadays, nudging has become an important and powerful component also of institutional decision architectures, that deal with difficile topics of societal scope. Nevertheless, the concept of nudging is critically discussed in the literature.

The significance of the **cultural context** for professional decision-making with a cross-cultural component cannot be underestimated. Deficiencies, ignorance or naïveté regarding this aspect can impair successful cooperation remarkably: avoidable misperceptions and time-consuming frictions can result. That is why, focus was put on identified essential cultural dimensions and the respective scales that reveal commonalities and differences. The intention of the presented concepts is to build awareness and pragmatic, constructive understanding of these determinants which are rooted in culture. The capability to understand and to cope with the cultural component in a respectful and professional manner, has positive effects on negotiating decisions on an international level.

The presentation of the concepts revealed a heterogenous picture of how decision-making is understood in the literature. The following part focuses on the practical side of professional decision-making.

5 Examples of professional decision-making

The present chapter is dedicated to the presentation of decision-making approaches from three different professional fields. Some key points of previous theoretical discussion reappear in the light of practical, professional application. This chapter is not only intended to give an overview about existing procedures, it also seeks to detect commonalities between the branches: The chosen comparative perspective is intended to show apparent similarities besides the discipline-related differences. This widens the view for fruitful interdisciplinary exchange and facilitates the transfer of knowledge and experience among different professional sectors.

The first part deals with aeronautical deciding. The second section is about decision-making in the medical sphere, and methods for approaching military decisions are in the center of the third major complex. For all three sections the following aspects are, among others, of particular interest:

1) *Established methods for decision-making and decision aids,*
2) *The significance of situational awareness and situational understanding,*
3) *Intuition and how to develop it,*
4) *Types and effects of biased thinking,*
5) *Specifics of the working field,*
6) *The relevance of an adequate error culture (Just Culture),*
7) *The guiding question of what can be considered as a good decision.*

An additional section focuses specifically on the application of checklists, since they represent an essential and practical decision aid in many fields. Here, focus is put on their day-to-day use in aviation and healthcare.

Making decisions is an essential part of everyday professional doing. Especially in high-responsibility fields like medicine, military or aviation – where decisions and their quality are linked to human life – this is the case. Deciding within these particular professional conditions and under the high demands of the working fields depends on profound up-to-date knowledge, expertise, technical skills, careful leadership and the ability to perform in a team. The high significance of teamwork will be stressed later in the contexts of the three branches. Since aviation has undergone a remarkable cultural change during the past decades, it is worth taking a closer look at how the shift from a rather aviator-centered, heroic attitude to team-oriented behavior sustainably shaped the branch. Of course, this also holds true for the task of making choices.

Being aware of the fact of human fallibility and personal limitations, it is only consequent to include the management of errors in the process of making decisions. The considerations comprise a wide spectrum of promoting conditions like the presence of

constraints, stressors and the influence of cognitive mechanisms (biases, framing etc.). The perspective on failure and the organization's attitude towards error are very important. Obviously, this has effective influence on the decision-making process as a whole. Depending on the internal management of error, decision-makers are likely to be more hesitant, risk-averse or also encouraged in making judgments. The linchpin is the so-called Just Culture, where errors are seen as a resource for learning and continuous improvement. According to this insight, aviation has made a considerable progress over the past decades which is reflected in decreasing numbers of aviation accidents. This cultural shift aimed to replace a rather uncooperative, unproductive mentality in case of failures by an open-minded and constructive attitude. – As will be shown later, this approach does not fit the conditions in the military field. Depending on the rank of the decider, errors can by all means lead to catastrophic results. Insofar, learning from mistakes is one of the important purposes of repetitive training, working with simulations and peacetime preparation.

As the previous theoretical section showed, the topic of intuition and how to build it, is lively debated in the literature. Often, intuition is associated with the rapid competent decision-making by experienced professionals. That is why, the three branches in the center of the present discussion, are partially associated both with legendary examples of skilled judgments and the admiration of outstanding persons. This applies, for example, to von Clausewitz' description of the "military genius", the appreciation for John Boyd's skills as an US Airforce pilot or to the successful emergency landing on the Hudson River of the civil pilots Sullenberger and Skiles. Clearly, the latter example is also demonstrably associated with the proper application of aviation-checklists. Generally, intuition is considered to be linked to gained expertise. Whereas, expertise arises from accumulated experience. Therefore, authors propose ways that allow novices to build expertise and intuition through practice in safe environments (simulation), training, learning by doing and guidance from experienced colleagues.

Clearly, decision-making is not an isolated process. Instead it represents a complex, responsible professional task that is in many ways embedded in organizations, teams, hierarchies and also authoritative structures. In many cases, the process is accompanied by technical decision aids. The technical contribution is taken into consideration for all three fields. Undoubtedly, technical progress (like the integration of AI) will continue to support – and to change – the way decisions are made significantly. This relates directly to the mentioned requirement of clarifying ethical questions. To sum-up, professional deciding requires appropriate attention, education and an organizational setting that corresponds with the questions to be tackled. That is why, decision-making is here not only described from a micro-perspective, but in the broader, branch-specific organizational sense as well.

5.1 Aeronautical decision-making

The term Aeronautical Decision Making (ADM) refers to cognitive processes and routines in making choices in aeronautical contexts. The definition of the Federal Aviation Administration from the U.S. Department of Transportation (FAA) clarifies as follows:

> *"ADM is a systematic approach to the mental process used by aircraft pilots to consistently determine the best course of action in response to a given set of circumstances." (FAA, 1991)*

Safety considerations are an overarching integral part of aviation, because a remarkable amount of risk has to be overcome and managed continuously. The safe conduct of a flight is always of utmost priority, since defective decisions might yield catastrophic and thus severe financial, legal and economic consequences. In order to prevent damage, to protect passengers, airlines and the reputation of civil aviation in general, decisions have to be made carefully, correctly and in a coordinated manner. The FAA explains accordingly, that "ADM builds upon the foundation of conventional decision making […], but enhances the process to decrease the probability of pilot error" (FAA, 1991). The above-mentioned aspect of coordination refers to the collective nature of decision-making in civil aviation. This means cooperation, coordination and division of labor in the cockpit, among the cabin crew and in other fields of work on the ground. Insofar decision-making in aviation is unequivocally seen as an act of teamwork, where "the team represents a distributed cognitive system in which each member may affect the collective decision-making process" (Skybrary, 2024 b). The role of an intact and competent team cannot be underestimated. Therefore, a key component of the *Crew Resource Management* (CRM) concept is teamwork. In a broader sense, CRM „can [...] be defined as a management system which makes optimum use of all available resources – equipment, procedures and people – to promote safety and enhance the efficiency of flight operations" (Skybrary, 2024 b).

The analysis of aviation errors and accidents reveals the high significance of human deficiencies. Interestingly, not the sheer technical skills bear relevant insufficiencies, rather a lack of interpersonal competence appears to make the difference. That is why, ADM procedures strongly rest upon factors like communication, interaction, feedback and effective teamwork. Insofar, CRM clearly benefits from an open professional exchange which includes the articulation of doubt, criticism and the acknowledgement of failure. This reflects also the strong trust in the capability of learning from mistakes. Consequently, the described mentality leads to an accumulation of knowledge and experience with a positive effect on subsequent decisions. The development of the CRM and the corresponding change of attitudes is also visible in common methods of ADM that are applied by pilots. A closer look is therefore taken at a procedure stemming from Lufthansa (LH) which is called **FOR–DEC**. The acronym represents the phases of the process and stands for: *Facts (F), Options (O), Risks (R), – (conscious pause), Decision (D), Execution (E)* and *Check (C)*. FOR–DEC is a well-known and widely established aid for ADM and judgment in the framework of CRM. It represents a brief method for solving emerging problems in the cockpit efficiently and effectively – and mostly under

high pressure and with only a limited amount of time. The procedure is explicitly intended to be executed as a team where all members are encouraged by its structure to make their contribution equally. Particularly with regard to the traditional allocation of roles in the cockpit, FOR–DEC stands for a remarkable progress, because it allows the open articulation of opinions that even might differ from the pilot-in-command's (PIC) point of view. Nevertheless, the captain's role is not disputed or limited: It still remains the clear prerogative and responsibility of the PIC to decide – but now after having taken the crewmembers' contributions into consideration.

The development of FOR–DEC is tightly associated with the recognition of human error as a major cause of aviation accidents. In hindsight many hazardous situations could have been avoided – even in the case of a safe landing – and decisions could have been made better. The continuous growth of air traffic affects ADM as well. As a direct consequence of the increasing traffic density the tasks, time pressure and the required constant situational awareness for the flying personnel are even more demanding. These findings led to manifold initiatives, which aim to learn from experience and to establish targeted educational measures. In order to meet prescribed safety standards and to enhance decision-making under the particular circumstances in aviation, Lufthansa and the German Aerospace Center developed FOR–DEC in the first half of the 1990ies. The formation process was characterized by a collaboration of aviation psychologists and Lufthansa airline pilots, who developed training methods for judgment and decision-making. (Hörmann, 1994) This close cooperation of experienced practitioners and scientists led to a process that became an important component of CRM and the airline's training programs. (Maschke, 1995) Since then, the successful method was adopted also by other airlines.

Basically, FOR–DEC works in a similar way like other structured decision-making approaches. The beginning is usually the initial perception of a situation that is triggering the demand for action. The process continues with gathering of information. Then, the collected data has to be evaluated in order to derive alternatives. Pondering risks and benefits paves the way further to making a choice. In the context of ADM, the FOR–DEC cycle is more complex and consists of seven consecutive steps. It even integrates a conscious pause and post-decision steps like the implementation, control and rethinking. The procedure can be performed individually by each crew member or together. Finally, the separate findings have to result in one single decision.

Table 13. The seven steps of the FOR–DEC procedure

1	2	3	4	**5**	6	7
F	**O**	**R**	**–**	**D**	**E**	**C**
facts	options	risk/benefit	deep breath	**decision**	execution	check

Every FOR–DEC step is associated with a specific question to be answered. These questions are intended to focus and to guide the attention onto the current phase. In doing so, impulsive, hasty and thoughtless action shall be prevented. Often this profoundly human behavior leads to avoidable grave consequences in aviation. The tight structure effectively facilitates directed, concentrated, coordinated thinking and conclusive decision-making.

Table 14. The phases of a FOR–DEC procedure

	Phase	Related Question	Description
1.	**F**acts	What is actually going on here?	*recognition of decision need, situation assessment, setting priorities*
2.	**O**ptions	What are the choices we've got?	*generation of options (no evaluation), if appropriate: SOP*
3.	**R**isk/benefit	What is to be said for/against the application of the options?	*assessment of risk/uncertainty, comparison of alternatives*
4.	deep breath	–	***conscious pause** before deciding*
5.	**Decision**	So, what shall we do after all?	*selection of the adequate option that balances risks and benefits best*
6.	**E**xecution	Who shall do what, when and how?	*coordinated planning and execution*
7.	**C**heck	Is everything still alright?	*continuous monitoring, revision and critical questioning of the cycle*
		end of the FOR–DEC cycle	
		Is the result already satisfactory?	*If yes → Terminate the process.*
		Is the result already satisfactory?	*If no → Initiate a new cycle with F. Iterate until successful completion.*

The outlined process[154] can be initiated by any crewmember who observes a problem which calls for attention. This holds true for those cases, where no prescribed process or Standard Operating Procedure (SOP) is applicable. Otherwise, these have priority. If an observed situation is apparently clear and instantly solvable, running a FOR–DEC cycle would be superfluous and unnecessarily time-consuming. Instead, immediate action can be taken. Sometimes the amount of time-consumption is held against formalized deciding and the required time for running a FOR–DEC process is compared to unstructured mechanisms like following intuition, hunches or gut feeling. Nonetheless, FOR–DEC provides the advantage of accelerating the solution by its clear structure and additionally relieves the crew from the hassle of an uncoordinated conversation. Moreover, reliance on a single person's more or less good intuition or on one's vague gut feeling lacks in transparency, teamwork and does not meet the professional standards

[154] See: Lufthansa Group (2024) and Fengler (2017, 2019) for short explanatory videos about the application of FOR— DEC, and also Kunde (2016) with explanations of the procedure.

of CRM. To sum up, FOR–DEC is therefore a suitable choice for complex situations when other rules or SOP do not have priority. The first stages before the actual decision take advantage of the valuable resources of knowledge, skills and experience of the entire cockpit crew. The fourth step represents a transitional phase from the joint effort in the preparatory phase to the solitary responsibility and the decision of the PIC. Afterwards the choice is put into practice and is monitored further.

As mentioned above, FOR–DEC is a Lufthansa concept. The following table provides a brief comparative overview of how Swiss and British Airways (BA) structure their decision approaches. Their intentions and the general structure resemble each other and differ only with regard to details. The designations are abbreviations which stand for the phases of the process.

Table 15. Comparative overview of FOR–DEC, SPORDEC and DODAR

Phases	**FOR–DEC** (Lufthansa)	**SPORDEC** (Swiss)	**DODAR** (British Airways)
1	**F**acts	**S**ituation catch	**D**iagnosis
2	**O**ptions	**P**reliminary actions	**O**ptions
3	**R**isks/benefits	**O**ptions	**D**ECISION
4	pause	**R**ating	**A**ssign tasks
5	**D**ECISION	**D**ECISION	**R**eview/**R**isk assessment
6	**E**xecution	**E**xecution	
7	**C**heck	**C**ontrolling	

SPORDEC is a procedure used by Swiss since 1999. It consists of seven steps which comprise the Situation catch (S), Preliminary actions (P), Options (O) and Rating (R) before the Decision (D) is made. Subsequently the Execution of the decision (E) and further Controlling (C) complete the process. BA applies the DODAR model for support in emergencies or abnormal situations. The cycle is performed in five steps which equally stand for the relevant stages of ADM. The procedure's components are: Diagnosis (D), Options (O), Decision (D), Assignment of tasks (A) and Review/Risk assessment (R). A variant contains after the options-stage an additional R-step for Risk and benefit analysis, which leads to DORDAR. (Hofinger, 2013)

A remarkable difference between the three models is the second step in SPORDEC which takes time pressure separately into account. The procedure requires at an early point in time immediate action to ensure the further process. Additionally, the last

SPORDEC phase does not only check the result, but also questions the correctness of the entire process itself. Similar to FOR–DEC, the iteration process is discontinued only, if the results are satisfactory.

The day-to-day application of procedures like FOR–DEC has been examined in a study to receive and analyze feedback from pilots. (Hofinger, 2013) The evaluation resulted in a heterogenous picture: manifold advantages and similarly justified critical arguments were derived from the answers. The following table briefly summarizes pros and cons accordingly.

Table 16. FOR–DEC – advantages and criticism

Advantages	Critical points
well-known, established and valued method among pilots	perceived as a time-consuming, artificial procedure
easy application, clear and brief structure	too stringent structure
acronym serves as a memory aid	omission of weighting the options in step O
integrates and respects all crew members and their contribution	wish for more emphasis on economic aspects in step R
supports teamwork and facilitates cooperation	reduction in step C in order to act instantly
requests to name all facts, supports direct feedback	application for the procedure's sake
protection in the case of error (revision of a decision)	process is used to confirm or to justify a factual decision

The ADM literature discusses in-depth the impact of the human factor on approaching decisions under demanding working conditions. Particular concern is expressed regarding the potentially hazardous influence of personal attitudes and behavior on the quality of decisions and finally on aviation safety in general. (Hofinger et al., 2013), (Gordon et al., 2013) As shown above, the described procedures seek to cope with human limitations and flaws. However, authors stress simultaneously the possibility to compensate and overcome these deficiencies with critical awareness, continuous learning and repetitive training. The decision-making literature in general also puts emphasis on several cognitive mechanisms and stressors that can impair or hinder the decision-making process. For example, this relates to several types of bias or to stress-induced limitations of human performance. In extreme cases such mechanisms can cause serious hazard when decision paralysis, wrong focus and ignorance lead to effects like fuel starvation as time elapses during the flight. The considerable negative effects of stress on physical and psychological performance – not only in aviation – are undisputed.

The section showed that the characteristics of aviation and the high safety standards of the branch require an adjusted approach of decision-making. The role of the human factor and facets of human nature represent an integral part of theoretical and practical ADM. Thereby, the ability to learn, to change and to improve behavior and skills characterizes the underlying optimistic line of thought. The presented decision aids aim to counteract the tendency to follow uncontrolled impulses in abnormal or stressful situations. Their purpose is to ensure decision quality in order to meet the high safety requirements of aviation.

5.2 Medical decision-making

The present section is about making decisions in the healthcare sector. Firstly, the general process of clinical decision-making (CDM) is outlined. Secondly and analogous to the previous part, themes like safety and management of failure are discussed on the basis of the current literature. Interdisciplinary approaches for learning among branches are conceptually based on similarities between the professional fields. Therefore, a comparative view is chosen afterwards and opportunities for beneficial transfer of experience between medicine and aviation are described. The discourse about parallels between both – high-risk, high-stakes, responsible and demanding – fields of work is not new. Studies provide valuable insights and reveal potential for adjusted application.

Medical Decision Making (MDM) follows a methodical approach. Its structure comprises the same essential elements like common models for decision-making. The process consists of consecutive phases and includes according to Gordon (2013):

1) *anamnesis/physical examination*
2) *diagnosis*
3) *assessment of severity*
4) *management.*

The following table summarizes these steps and illustrates a structured process that is fundamentally dependent on up-to-date clinical data, which is obtained through the physical examination, the patient's medical history, necessary tests and further information provided by the patient e.g. concerning the symptoms. (Bajaj et al., 2011) and (Mandell, 2021) Sound information is indispensable to complete the procedure and to refine the picture for the decider. In this context, the argument concerning the costs involved for medical tests and examinations is emphasized repeatedly in the literature. Similar to aviation, healthcare is a field of work that is exposed to noticeable cost pressure. Finally, this is also reflected in the scope of for the patient available services.

The table also refers to the high relevance of data in the context of evidence-based medicine (EBM).[155] This approach is based on the principle that informed decision-making in healthcare shall rely on evidence. Therefore, gathering, understanding, assessing and questioning evidence is key. Bate et al. (2012) summarize, that "[CDM] involves the judicious use of evidence, taking into account both clinical expertise and the needs and wishes of the individual patients" (Bate et al., 2012). These mentioned key aspects – external and internal evidence, clinical expertise and the patient's perspective – represent the three components of EBM.

[155] See also: Bajaj et al. (2011), Mandell (2021), ASHA Homepage and Bate et al. (2012).

Table 17. The phases of clinical decision-making

Phases of CDM	Explanation
All phases rely substantially on sound clinical information about the patient resulting from: anamnesis, physical examination, laboratory and ancillary tests.	**EBP**, general state of health All stages are interlinked in their sequence.
Anamnesis and Physical examination	Gathering of comprehensive, relevant information about the personal medical history of the patient. (personal or third-party anamnesis) The anamnesis includes information about the patient's person, general wellbeing, other health complaints, previous illnesses/surgeries, known allergies, details about medications, relevant information about known illnesses in the family, social data etc. Analysis of symptoms: subjective perception of complaints by the patient Physical examination means the accurate, systematic collection of observable information with the help of examination techniques (palpation, inspection, percussion, auscultation). Assessment of the state of gravity.
Diagnosis	The anamnesis and the results of the physical examination prepare a possible diagnosis. MDM with hypothesis generation and subsequent hypothesis testing → accepted/rejected initial differential diagnosis (pattern recognition) → presumptive diagnosis, if required (uncertainty) further diagnostic testing until a satisfactory state is reached. Clinical probability/likelihood of the disease → treatment threshold (= TT), balancing of risk/benefit (and cost)
Assessment of severity	Four degrees of illness: (1) minor, (2) moderate, (3) major and (4) extreme → The severity shapes the management.
Management	Four management questions: (1) stabilization, (2) hospitalization, (3) specific treatment (TT), (4) follow-up including the assessment of the response to the therapy important: shared decision-making (SDM)

The described consecutive steps in CDM lead from the initial data collection to the final decision. Thereby, the process is not necessarily linear: it is rather dynamic and requires insofar continuous situational awareness and understanding, flexibility and professional competence. If the patient's medical condition or the situation significantly change or new facts emerge, the process has to be adapted accordingly. The following explanation for healthcare professionals puts it concisely:

> *"[CDM]is a balance of known best practice (the evidence, the research), awareness of the current situation and environment, and knowledge of the patient. It is about 'joining the dots' to make an informed decision." (NHS, 2024)*

As shown, the process of CDM is influenced by the patient's contribution. Firstly, this refers to the information provided by the patient in the context of the anamnesis. Secondly, the so-called shared or negotiated decision-making (SDM) represents an inclusive process, that intentionally involves the patient. The person is in the center of the decision and does not remain passive. (NHS, 2024) On the contrary: personal wishes, ethical standpoints, the individual perception and tolerance of risk are respected. Additionally, the point of view of a close person or the patient's family can be considered as well, if it supports approaching the clinical decision. Insofar, SDM comprises informed consent, critical weighting, transparent information regarding the follow-up plan and the comprehensible communication of risk as well. (NHS, 2024) Especially in the management-phase of the CDM process joint action with the patient is key. The importance of the patient's contribution and his influence on the process cannot be underestimated. In a sense, decisions in the medical sphere are determined by the efforts of two different kinds of human factors: there is the professional side of the medical personnel and the patient's side.

The professional part of the human factor in the process of making choices is analyzed in the CDM literature as well. Similar to aviation, topics like bounded rationality, flaws in judgment, errors, stressors, cognitive mechanisms like different types of biases and their influence on the quality of choices are broadly discussed. (Bornstein et al., 2001) Also, EBM is obviously not free from the occurrence of non-rational influences. The result of bounded rationality and biases can significantly affect how information is gathered and interpreted by the diagnostician.[156] The first point refers to Herbert Simon's assumption, that the human capability of processing information is limited. (Bate et al., 2012) and (Simon, 1997) Additionally, this already limited capacity can be affected by various stressors that are associated with the professional circumstances like

[156] In this context, the ***gender health data gap*** and its consequences represent a concrete result of biases in medicine. It is a decisive element of the *women's health gap*. Whiting (2024) clarifies, that "[t]he health gap relates to the lack of equity concerning healthcare for women and men. This gap can take shape in many ways, from access to care to research." (Whiting, 2024). The above-mentioned phenomenon refers for example to the underrepresentation of female participants in medical studies leading to a considerable discrepancy of available data between male and female persons. See also: di Lego (2023), Mangler in: Gyncast (2024) and Whiting (2024).

time pressure, high workload, effects of sleep deprivation due to long working hours[157], distraction etc. Insofar, it is not surprising that many cognitive mechanisms in decision-making tend to simplify the process aiming to accelerate a decision. The following table provides a brief overview of biases that may (also in combination) influence the CDM process at any stage.

Table 18. Overview of types of bias in clinical decision-making[158]

Diagnostic Biases	Treatment Biases
confirmation/ascertainment biases selective gathering and interpretation of information that confirms a diagnosis, reluctance to change in the process, following the sunk-cost argument, choice of the obvious diagnosis	**regret/outcome/omission biases** feeling worse about negative outcomes due to active treatment than to inaction, taking more credit for treatment decisions that lead to positive outcomes
representativeness (availability/hind-sight/regret/anchoring biases) overemphasizing evidence that strongly resembles a class of events	**framing** choice of a treatment according to its relative description (storytelling)
search satisficing having found one diagnosis, no further detection of other existing conditions	**number of alternatives** choice of a given treatment option more often in the presence of additional alternatives

Particularly, in a professional setting, that is immediately linked to human life, the management of the human factor's possible influences should not be left to chance. The mentioned types of bias illustrate the wide spectrum of suggestibility. The literature therefore recommends profound education about the existence of bias, an attentive observation of personal behavior, awareness and self-critical reflection as ways of "debiasing". (Bornstein et al., 2001) Additionally, constructive teamwork can serve as an effective mechanism to detect and to deal with biased thinking. The following list of core skills for improved CDM resembles the described mentality of CRM in aviation. (NHS, 2024)

[157] Concerning the effects of sleep deprivation and the effective technical support with robot surgery, Mangler refers to her personal working experience. (Gyncast, 2024) Thereby, she explains how computer-aided surgery (CAS) compensates the effects of sleep deprivation during surgery in order to work precisely. "Es ist ein bisschen präziser als normalerweise, weil wenn ich zum Beispiel nicht viel geschlafen habe oder so und ein Tremor habe oder so, meine Hände wackeln, dann wird es von der Computerassistenz rausradiert sozusagen oder rausgerechnet und so ist es ein Tick präziser und man kann auch die Instrumente besser bewegen als eine menschliche Hand. Eine menschliche Hand kann man ja nicht 360 Grad bewegen, aber diese Instrumente schon." (Gyncast, 2024)

[158] According to Bate et al. (2012) and Bornstein et al. (2001).

1) ***continuous learning from experience:*** *improved awareness, pattern recognition, sharing of experience*
2) ***critical thinking and reflection:*** *including learning from mistakes (active reporting of incidents), self-critical attitude, general willingness to learn*
3) ***evidence-based approaches:*** *use of available evidence and best practice guidelines*
4) ***communication skills:*** *respectful and appropriate interaction including active listening, giving and receiving constructive feedback, sharing and professional management of gained information and experience, courage to express doubt and criticism*
5) ***respectful teamwork:*** *including multi-disciplinary cooperation and mutual support*

The discussion of the human factor's influence leads to the topic of medical errors. The possibly serious consequences of suboptimal CDM – both for the patient and the organization – require attention, effective measures for prevention and adequate management. The argumentation in the literature follows a similar line of thought like in aviation. Thereby, emphasis is put on how personal skills can enhance or impair the process of deciding. In a broader sense, this aspect is associated with the topic of a general safety culture in healthcare. Gordon et al. (2013) underline the potential hazard that can arise from a poorly developed safety culture, which tolerates inappropriate personal behavior, cultivates a dangerous mentality and misses the opportunity to learn from mistakes. (Gordon, 2013) The formerly described positive development in aviation is the result of a consequent, strict safety culture on all levels, the implementation of CRM in general and a fundamental change in the professional mindset. That is why, the literature recommends an adjusted transfer of this holistic aviation approach to healthcare. Studies have shown that the application of aviation-methods in medicine proved to be successful. (Wilf-Miron et al., 2002) Insofar, learning from other professions through the exchange of knowledge and the transfer of established, workable concepts are indeed an efficient way of actual improvement.

Commonalities of aeronautical and medical decision-making

The discussion of deciding in aviation and in medicine shows that both fields are indeed comparable in many ways and have – besides the specifics of each branch – a plethora of aspects in common. The following list is a brief overview of obvious commonalities.

1) ***challenges:*** *high-risk, high-responsibility and demanding fields of work*
2) ***regulation:*** *specifically regulated professional fields, embedded in frameworks of legal, political, ethical and economic restrictions and influences*
3) ***technical aspects:*** *technically complex work, continuous technical development (further digitization, integration of AI, remote work [remote tower concept, online consultations, telemedicine, computer aided surgery, robotic surgery, robots in clinics] etc.)*
4) ***education:*** *requirement of specifically, highly skilled professionals, need for continuous learning and training during the career*
5) ***role of teamwork:*** *important for the division of the workload, mutual support*
6) ***important role of the human factor:*** *human error and the organizational management of errors, professional mentality, awareness of biased thinking*

7) ***required flexibility:*** *work in dynamic and changing environments which require situational awareness and adequate management of information*
8) ***constraints:*** *financial, legal, technical, ethical constraints etc., limited availability of resources, organizational barriers like the limited access to material, additional staff or information, growing lack of skilled professionals*
9) ***possible stressors:*** *distraction, fatigue due to long working hours and changing shifts, work under (time, cost, competition) pressure, high expectations regarding the professional performance and the quality of the work, limited resources, technical failures, environmental factors (noise, limited space)*
10) ***economic environment:*** *cost pressure and fierce competition in the market, aggravating lack of skilled professionals*

The outlined commonalities between aviation and healthcare demonstrate that approaching decisions takes place under partly similar demanding conditions. Of course, these aspects are also true for other fields of work. The individual section about military decision-making of this work will also illustrate certain similarities, because military is obviously not less influenced by stressors, a competitive environment and high professional responsibility.

Insofar, the idea to transfer and implement concepts from aviation in the healthcare sector based on identified commonalities is not entirely new.[159] For example, event reporting systems already exist and the approach of Just Culture has also been introduced into the medical field. In Germany the Critical Incident Reporting System (CIRS) represents a platform for anonymous and uncomplicated reporting of critical events in healthcare. This puts the concept of learning from mistakes – instead of concealing them or putting the blame on others – into practice. This also applies for even minor, noncritical mistakes and near misses. In aviation, this blame-free culture led to an increased willingness to report incidents. Undoubtedly, this supported learning from mistakes in order to avoid their reoccurrence.
Gordon et al. (2013) state that the personal professional mindset in both sectors plays a key role – especially regarding failure and aviation/patient safety. (Gordon et al., 2013) The former sacrosanct role of the captain and the partially heroic aviator-centered view has been widely replaced by a more cooperative professional style in the cockpit. Nowadays, procedures like FOR–DEC facilitate by their design an open exchange and allow even criticism. This improves the decision quality considerably. The essential role of teamwork is theoretically undisputed in both sectors. The practical daily doing might although differ. Therefore, the ADM literature insists on recurrent training and practice in simulators in order to keep both technical and social skills on a high level. Aviation professionals rely on certifications, type ratings and trainings in order to be permitted to work. Gordon et al. (2013) remark that this scope of recurrent training is still not established in the field of healthcare. (Gordon et al., 2013)

[159] The application of concepts/technology from the military in other fields is also not new. This applies among others to the transfer of goods, software and technology: so-called dual-use. Military concepts are due to their element of competition interesting for entrepreneurial settings.

The described FOR–DEC procedure represents one of many aviation methods that is also applied in healthcare. (Rice, 2020) In the context of emergency medicine, the concept is appreciated for its clarity and effectivity. The structural opportunity for the open articulation of opinions and feedback enhances the quality of MDM and yet supports patient safety. Another method from aviation is the so-called "two-challenge rule" that is part of the "TeamSTEPPS" program.[160] (Pian-Smith et al., 2009) The rule reinforces the responsibility to speak up at least twice, if the own initial assertion has been ignored by the others. In doing so, the method opens the door for valuable remarks, observations, new information, doubt and constructive criticism – regardless the position in the professional hierarchy. This is indeed a crucial factor, since remarks from nurses or other colleagues are not always appreciated in healthcare.

The application of checklists in aviation and healthcare

The utilization of checklists as a tool for safety and quality management is widely established and appreciated in many professional domains. This holds also true for the fields of aviation and healthcare which clearly benefit from the application of specifically developed, purposeful checklists. The preceding comparative presentation of both branches brought out a variety of commonalities that are related to the responsible work in environments that are characterized by specific safety requirements, a significant workload under (time) pressure, the occurrence of distractions, indispensable team-coordination and considerable amounts of (changing) information. In order to meet the particular safety and quality standards in both fields, checklists are an effective support because of their capability to organize complexity, reduce ambiguity – without simplification – and to promote professional decision-making. Their successful implementation and diligent application are closely tied to certain preconditions. This relates among others to the demands regarding checklist design, the precise representation of the content and the indispensable acceptance of the users. The present section is intended to describe the methodology behind checklists and to demonstrate their contribution as a practical decision aid for medicine and aviation. In general, checklists are practical working aids in the form of concisely written documents[161] with a definite purpose orientation. Scope and envisioned context define the development of the concrete checklist. Their core function is being a memory aid that relieves the user cognitively and thereby prevents or reduces avoidable mistakes resulting from distracted attention and limited human capacities. They can help to structure complex processes or tasks, ensure and document completeness, consistency and compliance with due diligence obligations. Needless to say, they do not replace professional skills, judgment, knowledge or expertise at all. They rather represent reliable support, routine and structure in regular day-to-day work or in abnormal situations. Regardless of their practicality and simplicity of application, checklists have a multitude of advantages, that are summarized in the following table.

[160] This method is also used in an adapted form in military aviation.
[161] Here, focus is put on the written/printed form, although illustrated, electronic or (less reliable) mental checklists exist as well.

Table 19. Advantages and criticism of checklist application

Advantages	Explanation
Acceptance: well-known, tested, capable, effective, established and valued working aid	*Worldwide use of the method, institutional development (e.g. WHO, aviation safety culture)*
Application: efficient due to the accurate, comprehensible, uniform and brief structure; Individual or collective application (team)	*Focus on the suitability for the intended application → otherwise revision and adaptation Individual procedure or with team members*
Acronyms for specific checklists serve as mnemonic for recalling the right steps.	*Examples from aviation/medicine: IMSAFE, PAVE, TRAMP*
Teamwork: integrates, coordinates and respects all team members and their contribution by design, facilitates effective teamwork and mutual understanding	*Acknowledges the professional significance of teamwork, levels out differences, can enhance communication*
Workload: reduction of complexity and time-consumption, clear, unmistakable allocation of tasks, facilitation of professional cooperation, coordination and adequate, transparent division of labor, smooth shift handover and delegation of tasks	*Transparent, purposeful segmentation of complex tasks, workflows or processes in reasonable (sub-)steps, apportioning of tasks and responsibility. Documentation of completion. (Clarifies briefly, who does/did/will do what, why, in which order, how and when.)*
Support: help for staying focused in stressful situations, after interruptions or distractions	*Prevents negligent actions, omission or forgetting of important points/interdependencies*
Training of new staff members	*Supportive measure for introductive training of new staff, facilitates independent work*
Reference guide and orientation in complex tasks/processes/extensive timespans, relieves memory, support in non-normal situations	*Contains essential information for reference in compact form, helps keeping track of the current status, structures processes/projects/tasks*
Documentation and protection for cases of error or complaints, for internal and organizational requirements, comparison, quality control, adherence to quality and safety standards	*Legal record for possible lawsuits, verification of completion and compliance with due diligence obligations and standards, control that no prescribed steps are skipped/forgotten (safety culture/just culture)*
Cost: comparably inexpensive method	*relatively uncomplicated development*
Uncomplicated adjustment to changing requirements with revised versions, easy translation into other languages, adapted formats	*Improvement of the checklist according to demands of the organization, the users, learning from mistakes, or to factual changes → continuous reuse of an existing checklist is possible*
Criticism	
Perception as a burden of even more paper-work and an artificial procedure, application for the procedure's sake, use requires prior knowledge, dependence and reliance on checklists instead of knowledge and skills	

The benefits of checklist implementation are obvious, but their effectiveness finally depends on the acceptance of the user. Insofar, it is on the one hand crucial to convince[162] and to train staff members, and on the other hand to design checklists appropriately. Basically, there are two variants of checklists: *do-confirm* and *read-do* types, whereby the concrete development follows their intended usage.

Table 20. Main types of checklists

	do-confirm checklist/ challenge and response checklist	**read-do checklist**
method	***carry out task → confirm completion*** working from memory, relatively free in sequence	***read listed item → carry out task*** working step-by-step according to instruction
purpose	verification of task completion, to avoid overlooking of important steps in complex processes, segmentation and reduction of complexity, emphasis on timely application, correctness and completeness	concise summary of repetitive tasks in processes requiring the exact completion of individual steps in required sequence, guidance through the process, emphasis on precision and accuracy
examples	pre-flight checklists	fixed procedures, instructions, recipes

Corresponding to the organization's objectives and particular requirements, the matching type of checklist is chosen. Due to the variety of relevant tasks, a considerable number of such documents can accumulate. Therefore, it is worthwhile, to add the collection of developed checklists to an organization's process library that contains useful explanations and comments as well. Larger organizations have staff, who is responsible for checklists, their consistent development and proper application. As mentioned above, the creation of a checklist is not necessarily complicated, since templates are effortless available.

Usually, the well-known tabular layout consists of a column with checkboxes on the left-hand side of a page and next to it a column containing the list of items. Other checklists may lack the checkboxes – often in aviation related lists – because they are read and confirmed aloud. The clear arrangement of the content is very important with regard to easy legibility. Though, the formal design might seem trivial at first sight, the careful and thoughtful proceeding to create a sound checklist cannot be underestimated. The document is a synoptic summary of *only* essential items. Insofar, the creation requires a clear understanding of tasks or processes and their components.[163] Detailed instructions and explanations or comments are intentionally left out, but partially,

[162] Gawande (2022) describes in detail the difficulties in overcoming reluctance and in convincing users and their organization to integrate checklists into their clinical work.
[163] Gawande (2022) recommends having five (but not more than ten) items on a checklist.

references to further information is included.[164] If a specific sequence is required, the respective chronological order has to be considered. In order to keep the document short, it is clear that checklist application requires prior knowledge, experience and skills of the user.[165] KVWL (2024) recommends the PDCA cycle to systematically create a professional checklist.[166]

1) ***Plan:*** *identification of the problem (root causes), problem analysis, collection of relevant information and brainstorming about the process, systematization of gathered ideas and information, derivation of a conclusive written document, evaluation and control of the checklist.*
2) ***Do:*** *Approval and implementation of the developed checklist.*
3) ***Check:*** *Review of the precedent stage's effectiveness. The practical application reveals whether the checklist is suitable, effective, accepted by the intended users and if possible deficiencies (missing items, order, layout, difficulties in application, imprecisions) can be detected. Again, compilation of problems (root causes and solutions), identification of ideas for improvement and lessons learned.*
4) ***Act:*** *Improvement and adaptation of the checklist according to the results of the precedent check-phase.*

   If the result is satisfactory → end of the procedure
   If the result is not satisfactory → new PDCA cycle

The recommendations for checklist development according to Boorman (Nuclino Blog, 2019) consist of four essential aspects, whereby the first *"Investigate your failures" (1)* relates to the mentioned planning phase of the PDCA cycle. For Boorman "friction points" in routines become the starting point for a new checklist. The second advice is *"Focus on the 'stupid' stuff" (2)*, which means not going into detail, but providing precisely only the necessary, basic key points. Gawande (2022) emphasizes this criterion as well, since many avoidable (medical) errors result from rather simple causes.[167] The third aspect focuses on the tangible side of the checklist: *"Keep it simple" (3)*. Boorman summarizes, that the content shall be presented in a compact manner

[164] Needless to say, checklists shall be free from superfluous content and any distraction. But, the cuff checklists of the astronauts from Apollo 12 were adorned with cartoons from staff members and diverse photographs. The backup commander for the Apollo12 mission Scott explains: "We spent a lot of time going through the checklist to see where we could insert something humorous. We got that centerfold off the newsstand. Then we had to get it printed on fire-proof plastic-coated paper" (Theophanides, 2011). See Jones (1996) and Theophanides (2011) for detailed checklist photographs and comments. Additionally, Boorman, the technical lead of the development of the 787's pilot system of checklists, remarks, that "an occasional emoji is a guilty pleasure we allow ourselves to indulge in" (Nuclino Blog, 2019).

[165] Nevertheless, the KVWL publication recommends checklists for training purposes of new staff in healthcare. (KVWL, 2024, p. 96)

[166] See also Bulsuk (2009) and Skhmot (2017) about the PDCA cycle.

[167] Gawande (2022) provides examples for these simple causes of error like: lack of orderly disinfection, forgetting to wash hands, not counting materials after surgery, surgery on the wrong patient etc. Checklist application can effectively prevent such easily avoidable mistakes.

which does not exceed one page. Unnecessary color shall be avoided and in order to prevent distraction and to promote easy readability; a sans serif font is recommended. The fourth criterion covers the mentioned dichotomy regarding the general type: *"Decide between a 'do-confirm' or a 'read-do' checklist" (4)*. The first is rather suitable for verification after completion of the task from memory. The second type is recommended for tasks that require high precision. As seen, the significance of user-friendliness cannot be underestimated.[168] The orientation on those, who work with the checklist, has many facets which range from legibility, readability, format, material to the circumstances of application (e.g. during night-time). Checklists and their aim a closely tied to their acceptance, discipline and correct use. The following recommendations from OAS (2001) relate to the occurrence of avoidable aviation accidents caused by incorrect application or failure in checklist use:

1) *"Make a habit of using checklists consistently.*
2) *Do your checklist when the workload is low.*
3) *Avoid distracting conversation when performing checklists.*
4) *Treat any checklist interruption as a red flag that could cause you to miss a critical item." (OAS, 2001)*

Undoubtedly, these recommendations are generally valid for the application of any checklist. The last two points refer to disturbances and interruptions in performing a checklist which can lead to errors. Linde et al. (1987) investigated from a linguistic point of view interruptions during checklist application in a cockpit. According to their analysis, it is key to manage in particular the actual duration of the interruption *(hold)* and to resume *(continue)* the checklist. The authors remark that it is not completely under the control of the crew if and how often disturbances (radio communication, other tasks in the cockpit etc.) occur, but how long it takes until focus is guided again on the checklist can rather be influenced. Other, seemingly trivial, conditions can hinder the correct completion as well: missing of the checklist, using the wrong document, insufficient readability or practical inconvenience. If the application is perceived as a time-consuming burden or additional workload, the intention is taken ad absurdum, because users might tend to disregard the checklist completely.

[168] The NASA published a comprehensive document that is dedicated specifically to typographic aspects concerning checklists. It covers among others topics like legibility of print (font and font size), readability (italics, bolding), color and contrast (visibility depending on illumination), opacity of the paper, lamination/glare, quality of the print and viewing abilities of the user.

Degani (1992) provides examples of fatal aviation accidents caused by difficulties with checklist application (poor readability, lack of consistency). Therefore, he stresses the relevance of the quality of documents used on the flight-deck. See Degani (1992) for more details about checklist typography.

Checklist application in aviation

The beginning of aviation checklists is often associated with the accident of a B-17 in 1935, where experienced and trained test pilots crashed with the bomber during climb. The accident was obviously caused by pilot error due to the complexity of the new aircraft. Technical flaws of the aircraft were not responsible for the accident. As a consequence, Boeing developed a pilot checklist prescribing concretely the duties of the pilot and copilot in order not to miss any important detail to fly the plane safely.[169] The solution proved to be – compared to the considerable damage – simple but effective; since then flights with the B-17 were safe. The obvious advantages of aviation checklists spilled over to spaceflight due to their success and became an essential component of the NASA safety culture. Astronaut Michael Collins, part of the Apollo 11 mission, even coined the expression of the "fourth crew member" which underlined the essential contribution of checklists for the mission.[170] Hersch (2009) explains, that

> *"[a]stronauts and engineers of the National Aeronautics and Space Administration brought manuals and checklists with them from aviation where they were already well established; in space they proliferated. Composed in a language approximating English but mostly incomprehensible to the uninitiated, in-flight documentation has been the key to the complex technologies aboard all of America's spacecraft" (Hersch, 2009).*

Regardless the technical advancements since the early days of checklist implementation, their significance for aviation is undisputed. (This applies not only for professional aviation like commercial or military; also, for private pilots in general aviation, proper checklist application is an essential aspect of safety.) The general distinction between the mentioned common types of checklists exists in aviation as well. Additionally, the checklist application in *normal* and *non-normal* procedures is distinguished. The first refers to the regular course of the flight and the required standard operating procedures (SOPs), whereas the second relates to emergency or abnormal conditions[171]. These parameters determine the checklist category of choice. The following table summarizes the key points of both types according to the explanations on Skybrary (2024d, 2024e, 2024f).[172, 173]

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[169] See also Taylor (2020) for a picture of the original B-17 checklist from 1944 and comments.
[170] The detailed NASA "Apollo Stowage List" for the Apollo 11 mission in 1969 is an impressive example of the contribution of checklists. (NASA, 1969)
[171] **Emergency situation** means that "the safety of the aircraft or of persons on board or on the ground is endangered for any reason"; an **abnormal situation** represents conditions where "it is no longer possible to continue the flight using normal procedures but the safety of the aircraft or persons on board or on the ground is not in danger" (Skybrary, 2024e).
[172] PF = pilot flying, PNF = pilot non-flying
[173] Dismukes et al. (2010) discuss based on a qualitative study, deviations from checklist application in cockpits and analyze how checklist discipline can be improved effectively. See also Degani et al. (1990) for comments about checklist misuse or rejection.

Table 21. read-do and challenge-response checklists in aviation

	read-do checklist	**challenge and response checklist**
formats	printed paper or electronic versions of checklists	
application	**in non-normal procedures** (also: abnormal and emergency procedures) 1) reaction from memory 2) checklist application (EAC) 3) further action (EAC)	**in normal procedures** (**SOP** and part of crew coordination) normal operation of the aircraft in all phases of the flight; performance from memory according to cockpit flow pattern (specific sequence of memorized actions without checklist reference); specific critical items, cross-check → **challenge-response-checklist**
proceeding	Immediate reactions to emergency or abnormal situations on board are carried out **from memory**. Action taken is then confirmed by reference to the **"Emergency or Abnormal Checklist"** (EAC), which also contains **subsequent action**. (e.g. fire, engine failure, loss of cabin pressure, pilot incapacitation, worsening weather, fuel shortage)	PNF reads out the respective item and PF confirms the status/configuration (e.g. altimeter, flaps) Electronic checklists: items may disappear/change color automatically after correct completion of the task, active annotation as "checked" partially possible
purpose	"[…] support flight crew airmanship and memory and ensure that all required actions are performed without omission and in an orderly manner." (Skybrary, 2024d) → **strict focus on safety** For reference: The "Quick Reference Handbook" (QRH) contains the relevant (normal/non-normal [EAC]) checklists.	

The tabular overview highlighted the significance of effective, professional teamwork – good crew coordination – and strict adherence to SOPs as essential contributions to aviation safety at any time during operation. The correct application of **normal checklists** is an important SOP and represents a part of good flight crew discipline. (Skybrary, 2024 f) These checklists are used after having thoroughly completed from memory all parts of a SOP. Their purpose is the verification of proper accomplishment. This type of checklists is generally relevant for all phases of the flight, but especially for critical stages like takeoff, approach and landing. Normal checklists have to be initiated (requested/called for), performed and completed according to crew coordination SOPs. Skybrary (2024f) explains the routine as follows.

1) *Initiation of normal checklists: requested by the PF, read by PNF (if the PF fails to initiate, the PNF suggests it according to good CRM practice[174]), preferably during times of lower workload (prevention of time pressure/interruption) → requires sound time and workload management, respectful teamwork*

2) *Conduction of normal checklists: with challenge-and-response method[175], response of PF to critical items, less-critical items can be challenged/responded by PNF alone → standard rules and phraseology for normal checklists (purpose: reduction of ambiguity, improved crew communication)*

   Conduction of the checklist according to the specific rules until" (checklist name) checklist complete" marks the end of the procedure. Some normal checklists contain intended hold points where the list can be paused. (support by electronic displays of normal checklists available)

3) *Management of interruptions: in case of an interruption of a normal checklist the PF announces an explicit, formal "Hold (stop) checklist at (item)"and continues analogously "Resume (continue) checklist at (item)". (repetition of the last completed item before the interruption in order to prevent omission)*

As shown above, the management of **non-normal** cases differs from the regular proceeding. The applicable EAC handbook contains both, the relevant emergency and abnormal checklists, and prescribes actions which serve as initial response element. (EAC and the Operations Manual have to be congruent.)[176] In this context, Gordon et al. (2013) highlight an important aspect of non-normal situations: people might tend to do *something* instead of taking time to assess the problem first and then doing the *right thing*. Additionally, focus on operating the aircraft has to be maintained at any time. Therefore, the authors recapitulate a reasonable, practical approach:

> *"One major airline had a fairly simple emergency checklist philosophy: recognizing that any emergency would raise the stress level as well as the potential for making a bad situation worse by rushing into a solution, the airline's policy was that*

[174] Checklist application is nonnegotiable and regulations require that the respective checklists have to be completed. So, it is the duty of each team member to insist on the proper use, as Gordon et al. emphasize (2013, p. 128).

[175] The application of challenge-response-concept reflects also the overall safety culture of aviation that recognizes the limited human capacities and the possibility of failure, because "[…] human factors principles dictate a challenge-and-response process between two crewmembers for conducting checklists and drills, in recognition of the susceptibility of memory to failure at critical moments" Skybrary (2024a).

[176] For more information about EAC see also Skybrary (2024e), (2024 g).

the first step in any crisis was to first fly the airplane and then to assess the situation." (Gordon et al., p. 128)

Here, the view remains narrowed to the common application of normal checklists, since central aspects of day-to-day routine use are of particular interest.

As mentioned before, acronyms serve as **memory aids** for pilots to recall easily the steps of essential checklists.[177] – The considerable workload in a cockpit, the necessary constant situational awareness and the changing environment require a lot of attention by the crew. Therefore, mnemonics are useful for two particular reasons: Firstly, memory aids can relieve the memory in routine operations. Secondly, mnemonics help direct "the mind towards required actions during periods of uncertainty, or intense activity and/or emergency; i.e. preventing distraction from less critical issues" (Skybrary, 2024a). – The *IMSAFE* checklist is a method for self-assessment in order to verify whether a pilot is generally fit to fly. Partially, the additional *E* for emotion is included. This brief self-check facilitates the decision before flight whether it is safe to operate an aircraft or not. The *PAVE* checklist is used for a more complex pre-flight risk assessment and also determines whether the risks are acceptable and it is safe to conduct the flight. The document's items are mainly mandatory due to legal prescription.

1) ***IMSAFE*** = ***I****llness,* ***M****edication,* ***S****tress,* ***A****lcohol,* ***F****atigue,* ***E****ating (****E****motion).*
2) ***PAVE*** = ***P****ilot,* ***A****ircraft, en****V****ironment,* ***E****xternal Pressures.*

According to FAA (2022), the first step *P* is the connection of both checklists, whereby *IMSAFE* clarifies the safe physical and mental state of the pilot. Additionally, this step refers to the completeness of licenses and required certificates. Further, currency and proficiency reflect the skills and experience of the pilot. *A* relates to the aircraft and includes among others the pilot's familiarity with the aircraft, all required documents and equipment on board, fuel and the required capacities. *V* stands for the pilot's risk assessment concerning the weather, airport, terrain, airspace and conditions and time constraints. The last step *E* takes other external factors into consideration that could increase the risk of the flight. These factors, for example, include external expectations, avoidance of delays for passengers or emotional pressure. – As seen, both checklists serve for risk identification and assessment prior to flight. Thereby, adherence to prescribed safety standards is the main goal. Of course, the application of mnemonics in aviation is not intended to replace the use of checklists. The mentioned acronyms rather serve as a mental hook for pilots and help to keep all items in mind.

Checklists are an integral part of the holistic concept of safety culture in aviation. As seen, the distinct components are closely related and not only the technical skills, but also the human factor is explicitly considered. Therefore, effective checklist application

[177] For more details about pilot memory aids and the respective regulations (FAA) see also: FAA (2022), Skybrary (2024a) and Pilot Institute (2023).

does not only depend on the correct completion of individual items, it is also the result of good crew cooperation, communication and reasonable workload management. The literature highlighted the aspect of checklist discipline which comprises regular training, strict adherence to SOPs and consequence in teamwork. Checklist use in performing routine tasks is efficient, and none of the simple "stupid stuff" is overlooked. In non-normal contexts, checklists help to guide attention effectively on the relevant issues and thereby facilitate the adequate situation's management. A well-known example is the successful landing by the pilots Sullenberger and Skiles on the Hudson River of flight AWE 1549. The value of checklists, besides other tools and technological support, cannot be underestimated; their capability to reduce or avoid human error and aviation accidents is proven.

Checklist application in healthcare

The metaphoric expression of the *golden hour*[178] or even the *golden five minutes* vividly illustrates how precious, scarce and critical time is in medical contexts. This particular valuable amount of time relates to the fact, that time is a critical factor especially in emergency and trauma care of injured people. The *golden hour* stands both symbolically for an extraordinary period of time and the assumption, that "trauma patients have better outcomes if they are provided definite care within 60 minutes of the occurrence of their injuries" (Lerner et al. 2001, p. 758).[179]

> *"There is a golden hour between life and death. If you are critically injured you have less than 60 minutes to survive. You might not die right then; it may be three days or two weeks later – but something has happened in your body that is irreparable."*
> *(Cowley, A., UMMS, 2024)*

The popular, though partially questioned, concept stems from Cowley reflecting his experience in emergency and trauma care. Regardless the controversy in the literature, the necessity of efficient use of limited time and skill is undisputed. Similar to aviation, healthcare is among others characterized by a considerable workload under time pressure and high safety requirements. As seen in the previous section, the successful use of checklists is associated with enhanced productivity, efficient workload management, good teamwork and support for both routine and non-routine tasks. The present part focuses on the application of checklists in the medical field.[180] Therefore, a particular

[178] The term *golden hour* refers to photography and the beauty of sunlight during the first hour after sunrise and the hour before sunset.
[179] The authors question this widely accepted idea in their study and conclude: "Our search into the background of this term yielded little scientific evidence to support it" (Lerner et al., 2010, p. 760). Contrary is the opinion of Gawande (2007) in the context of medical triage. He describes the grave time criticality in taking care of injured soldiers and emphasizes even the *golden five minutes*.
[180] The discussion of checklist implementation and regarding measurable effects is heterogenous in the healthcare literature. Proponents unanimously underline the advantages of the method and

example of worldwide use is presented. The development of the **WHO Surgical Safety checklist** dates back with its beginnings to the year 2007.[181] A study aimed to investigate the effects of consequent checklist implementation on the numbers of surgical complications. Therefore, a 19-item surgical safety checklist was "designed to improve team communication and consistency of care" aiming to reduce complications and deaths associated with surgery (Haynes et al., 2009, p. 491). The following aspects represent the key points of the study. (Haynes et al., 2009, p. 492-493)

1) *"Data suggest that at least half of all surgical complications are avoidable."*
2) *"A growing body of evidence also links teamwork in surgery to improved outcomes, with high-functioning teams achieving significantly reduced rates of adverse events."*
3) *"On the basis of [WHO] guidelines we designed a 19-item checklist intended to be globally applicable and to reduce the rate of major surgical complications."*
4) *"We hypothesized that the implementation of the checklist and the associated culture changes it signified would reduce the rates of death and major complications after surgery in diverse settings."*

In the light of the precedent discussion of aviation checklists, parallels to CRM are obvious. The emphasis on good teamwork and a cultural change – like in aviation – in the healthcare sector are integral part of the approach. The first item relates to the "acceptance" of medical error. Sullenberger argues, that "[i]n aviation, such rationalizations for avoidable human error were rejected long ago and replaced with the creation of a robust safety system that has now become the culture of the field" (Gordon et al., 2013, p. viii).

The checklist[182] comprises three major parts which segment the surgical process into the phases: *Sign in, Time out* and *Sign out*. The checklist "is used at three critical junctures in care: before anesthesia is administered, immediately before incision, and before the patient is taken out of the operating room" (Haynes et al., 2009, p. 493). The individual steps are intended to be performed as a team. Thereby, emphasis is put on precise and efficiently guided communication. The team members have to be introduced to each other, since there is clear evidence for better performance and cooperation, when the participants know each other – at least by their name and function. This is in particular relevant for teamwork in larger organizations with changing team constellations. The roles and duties are unequivocally assigned in the checklist. This relates also to the

emphasize the ubiquitous application in aviation, whereby others recognize the wider medical context and criticize unadjusted transfer. See e.g.: Gordon et al. (2013) and Papoutsi et al. (2018).

[181] The publication of Haynes et al. (2009) presents the results of the *WHO's Safe Surgery Saves Lives program*. See also: WHO (2024a). The development and implementation of the 19-item surgical safety checklist is explained also in Gawande (2022).

[182] A training video of the complete checklist application is available online, see: (NHS, 2019). For the written form see: (Haynes et al., 2009, p. 492).

positions to be confirmed during the process. The following table recapitulates the central checklist stages according to Haynes et al. (2009).

Table 22. Core Elements of the WHO Surgical Safety Checklist

Phase	Tasks
Sign in	***before introduction of anesthesia*** *team members (at least nurse + anesthesiologist) orally confirm the following:* – Verification of the patient's identity, surgical site and procedure + consent – Surgical site is marked/site marking not applicable. – Pulse oximeter is on the patient and functioning. – All team members are aware of patient's known allergies. – Evaluation of patient's airway and risk of aspiration + appropriate equipment and assistance are available. – Risk of blood loss: appropriate access to fluids is available.
Time out	***before skin incision*** *the entire team + any other participants involved orally confirm the following:* – Confirmation of introduction of all team members (name, role) – Confirmation of the patient's identity, surgical site and procedure – Review of the anticipated critical events including: critical/unexpected steps, operative duration, anticipation of blood loss (specific concerns of the anesthesiologist, confirmation that prophylactic antibiotics have been administered as prescribed, confirmation of sterility, equipment availability and other concerns) – Confirmation of display of the correct patient's essential imaging results
Sign out	***before the patient leaves the operating room*** *nurse reviews the following items aloud with the team:* – name of the procedure as recorded – that, if applicable, needle, sponge and instrument counts are complete – that the specimen (if any) is correctly labeled + patient's name – relevant equipment issues *The surgeon, nurse and anesthesiologist review aloud the key concerns for the recovery and care of the patient.*

The introduction and application of the checklist requires indeed appropriate training of the staff members in order to ensure checklist discipline, correct adherence to the items and consistent documentation. Gawande (2022) recalls the hesitancy, reluctance and skepticism during the study, since the implementation of a new procedure – involving team members from all levels equally – requires some flexibility of the

organization. (In addition, the remarkable influence of the status quo bias cannot be underestimated in such cases.) The results of the study showed measurable improvements regarding patient safety. The rates of any complication, the total rate of in-hospital deaths and the overall rates of surgical-site infection and unplanned reoperation dropped at all included sites after the introduction of the checklist.[183] Insofar, the authors conclude, that "[t]he reduction in the rates of death and complications suggests that the checklist program can improve the safety of surgical patients in diverse clinical and economic environments" (Haynes, 2009, p. 496). At the same time, it is recognized, that the improvements are not singularly associated with the checklist itself: rather a more complex change, that affects the professional mindset, established new routines and workflows and the increased sensitivity for safety aspects, has taken place around the document's application. In sum, the positive convincing results led to the global application of the checklist (in adapted form).[184]

Papoutsi et al. (2018) discuss implementation and results of the "**Frailsafe"** checklist in twelve hospitals across the UK that was intended to improve specifically the safety of older patients with reliable frailty assessments. The results of the study confirmed the skepticism about transferability of checklists to the field of geriatric care. The authors recognize rather social barriers associated with hesitancy, rejection (perception as additional workload) and established professional hierarchies and boundaries. The authors explain, that "[f]ormalizing tasks and work processes in the form of a checklist placed increased emphasis on 'work-as-imagined' […] which some hospital teams found difficult to reconcile with 'work-as-done' in the messiness of everyday practice" (Papoutsi et al., 2018, p. 315). In conclusion, the authors state that "more attention to the socio-technical work" is required instead of the introduction of as technically perceived methods. (Papoutsi et al., 2018, p. 315)

An important aspect of healthcare work is coming quickly to sound assessments and adequate priorities. A multitude of checklists exists in order to organize daily routines in healthcare.[185] This applies among others to patient communication, administering medication correctly, triage or for ensuring the availability of complete, functioning equipment. Similar to aviation, **acronyms** help also in medicine to recall checklist items quickly. The Medication checklist acronym *TRAMP* stands for: *T*ime, *R*oute, *A*mount, *M*edication and *P*atient. The checklist is intended to increase patient safety by supporting nurses in administering medicine correctly, since "[r]esearch on medical administration errors (MAEs) shows an error rate of 60%, 34 mainly in the form of wrong time, wrong rate, or wrong dose" (Nurselabs, 2015).

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[183] See Haynes et al. (2009) for detailed and contextualized results.

[184] Urbach et al. (2014) applied the method in a study with Canadian hospitals, whereby, the positive outcomes of Surgical Safety checklists could not be observed by the authors.

[185] For example, WHO (2024b) provides an equipment checklist for a triage area. See also Nurselabs (2015) for various pharmacological mnemonics. Checklists for rescue service are part of the comprehensible compendium by Jahn et al. (2022).

The author of this text had the opportunity to gather direct information regarding checklist familiarity and use from experienced medical professionals in informal conversations. All consulted persons confirmed the significant contribution of checklists in their day-to-day work. For example, in ambulances the standard stowage lists facilitate a smooth shift handover of the vehicle and make sure that all required equipment and consumable supplies are complete. Some respondents explained to know the checklist items by-heart due to the daily repetition. The author had the chance as well to read both a First Aid checklist of a nursing home and the adapted version of the WHO Safe Surgery checklist of a large German hospital.

The First Aid checklist was extensive and detailed. It contained elements of read-do checklists and comments. The amount of details and the layout over three pages did not contribute to gaining a quick overview. Additionally, the compact presentation affected the readability. The Safe Surgery checklist reflected clearly the structure and items of the original WHO template. In comparison, the document was shorter, clearer and more precise. Considering, that the latter covers the essentials of a complex surgery, the checklist was more precise, concisely and efficient compared to the First Aid document. Insofar, the immense efforts of the WHO checklist development are obvious. Nevertheless, the individual checklist is intended to be workable for the respective organization. – The First Aid document was only available in German. Considering the fact, that nursing homes employ also international staff with different levels of local language proficiency, the development of versions in different languages is recommendable; particularly in the light of effective patient safety in emergency situations.

Summary

Checklist integration and their correct application tangibly reflect the attitude towards compliance with safety standards in aviation and healthcare. Correct application effectively reduces human failure – a major cause of often avoidable aviation accidents or preventable medical complications. Insofar, checklists mirror and ensure quality and safety standards for both branches and are at the same time a capable tool to meet these aspirations. Sullenberger clarifies, that “aviation safety was improved through more than checklists, as important as those are. Checklists alone cannot cure the current fragmentation of patient care or advert tragedies […]” (Gordon et al., 2013, p. viii). The precedent discussion showed the interwoven components of the holistic aviation safety culture, where checklists are one of many essential components. Insofar, the unadjusted interprofessional transfer across settings of only one isolated method is insufficient. This relates in particular to the mindset of CRM and the appreciation of team intelligence in aviation.

As seen, checklists are a comparably simple, though effectively applicable tools to even complex situations.[186] Due to their capability to guide attention and to reduce ambiguity and complexity, checklists are indeed a suitable instrument to promote good decision-making. Undoubtedly, the preparation of decisions can benefit from the systematic, transparently reproduceable, controlled and unemotional proceeding. The degree of checklist integration differs between aviation, where their application is widely mandatory, and healthcare. For both branches the positive effects of correct use are measurable.

[186] Similarly effective is the *Poka Yoke* approach (part of Lean Management). It is intended to prevent failure through the conscious design of processes. Like checklists, *Poka Yoke* structures workflows in order to prevent human error.

5.3 Management of human failure – The approach of Just Culture

The management of failure in organizational contexts has also direct consequences on how decisions are made. Positive or negative failure cultures can remarkably influence the behavior of the involved persons in the process of making choices. Aviation and also the field of medicine have established specific systems in the framework of safety culture for not only managing error, but rather for using them as a source for learning and improvement. Therefore, this section provides an overview about *Just Culture* in both fields.

The spectrum of potential failure is broad and comprises minor lapses, slips, omissions, frequent errors or even chains of mistakes with fatal consequences. The past decades provide numerous, partly tragic, examples from operations in the nuclear, military, mining, aviation or medical sector. Even if the impact is less grave, or even no damage has occurred, it is highly important to face the disposition of being vulnerable from a managerial point of view. Sharpening awareness and fostering a deeper understanding of error in day-to-day business is key to prevention and for enhancing safer operation. Additionally, the ex-post perspective provides valuable information in order to understand the processes or deficits behind the occurrence. Often, individual mistakes are perceived as singular, isolated occurrences. But this can also be interpreted differently, videlicet as an indicator for a malfunction in the system, which led to the mistake in consequence. Insofar, proper diagnosis, analysis, correct interpretation, an open mind for the circumstances and a respectful cooperation with the people involved serve as a solid basis for learning from experience. The concept of *Just Culture* embraces this approach and has become an integral part of the *Safety Culture*.[187] Obviously, the linchpin is being open for a corporate culture that has the strength to tackle mistakes actively. Undoubtedly, this requires on one hand a genuine contribution – open reporting – of the involved. On the other hand, the assurance of a safe reporting environment is the indispensable counterpart. Reporting, building trust and learning from error are the pillars of Just Culture.

As mentioned before, the fields of aviation and healthcare recognized the need for especially safe operation. Both branches are associated with a particular importance of faultless work, since human error might lead to fatal outcomes. Understanding the causes, learning and effective prevention are key for safety not only in aviation or healthcare. The driving forces in this regard do not only represent social responsibility, legal obligation, ethical aspirations or ambitious optimization measures, but also economic motives. Corporate appearance and an organization's success are highly dependent on reliability and orderly performance. Severe mistakes and subsequent juridical

[187] Marginal note: Safety Culture intends as a holistic approach to improve safety in all operational areas. In aviation, this includes among others flight/cabin crews, Air Traffic Control, maintenance and conceptually manufacturers and suppliers as well. ICAO: *"Within the context of aviation, safety is 'the state in which the risk to harm to persons or damage to property is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management." (ICAO 2013, Doc. 9859, SMM, p. 2-1)*

lawsuits can have a considerable financial impact on the success of a company. Further, the pressure to keep up with competitors in a contested environment like aviation cannot be underestimated. Additionally, aviation and healthcare are in particular publicly and governmentally supervised branches with high interest from various stakeholders.

The practical implementation of Just Culture arose from the insight, that narrowed focus on investigation and punishment are not sufficient for preventing mistakes in the long run. Using the experience from failure proved to be more effective.[188] This led to a remarkable shift from a "blaming culture" to a "learning culture", whereby Just Culture does not free from responsibility or accountability. Passing the threshold of reporting – even if it is mandatory – requires a sense of responsibility and honesty. It also does not per se exculpate people from the consequences of their actions.[189] Errors that are not concealed, can indeed become a source for learning and improvement. That is why, the concept of Just Culture does not follow punishment for *honest mistakes* and consciously avoids sheer sanctioning, blaming or even stigmatization. Insofar, it is crucial to be institutionally prepared with regard to the corporate culture to manage failure adequately. – Reason (in: GAIN, 2004) understands Just Culture as:

> *"An atmosphere of trust in which people are encouraged (even rewarded) for providing essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behavior."*
> *(GAIN, 2004, p.4)*

This explanation stresses the crucial aspects like trust, reporting and individual culpability. It also illustrates the mentioned fundamental paradigmatic shift from a blaming culture to one that honors learning from mistakes. Dekker (2017) argues that "it is foolish to expect fallible people to be perfect." (Dekker, 2017, p. 2) This means, that mistakes do not only have to be expected, but become a managerial task. Similarly argues Reason: "In order that organizations learn from incidents, it is necessary to recognize that human error will never be eliminated; only moderated" (GAIN, 2004, p. 6).

The management of human error reaches beyond the decisions of individual organizational structures. The ICAO[190] and the European Law created a legal framework that reflects Safety and Just Culture, whereby its binding and reliable character is an advantage. The core areas of the ICAO regulations are as follows:

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[188] Websites from organizations publish easily accessible anonymous incident reports. Thereby, the amount of available information becomes visible. The gathered information through protected reporting is indeed a rich source for sharing knowledge and for professional development.

[189] Dekker (2016) describes cases from aviation and medical professionals who suffer tremendously in the aftermath of fatal mistakes. Some cannot bear the traumatic burden of responsibility and commit suicide. (Dekker, 2016)

[190] Annex 13 to the "Convention on International Civil Aviation" deals with "Aircraft Accident and Incident Investigation". In chapter 8 it contains the stipulations concerning Just Culture, whereby the focus is on prevention. Annex 19 was developed to unify safety-relevant issues from various Annexes and to meet higher requirements due to the increase of air traffic.

- *Voluntary/mandatory incident/accident reporting systems*
- *Non-punitive reporting environment (confidentiality)*
- *Data-processing, databases (ECCAIRS) and analysis (data-protection, confidentiality)*
- *Dissemination of final reports (lessons learned)*
- *Exchange of information (with the relevant stakeholders)*

Contracting states are obliged to report relevant occurrences to ICAO which flow into the ADREP/ECCAIRS (Accident/Incident Data Reporting). It is intended to share the gained data in order to support learning from experiences. Similar to the provisions of the ICAO, the institutions of the European Union follow a Just Culture approach.[191] The term Just Culture is defined legally and means

> *"[…] a culture in which front line operators or others are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but where gross negligence, willful violations and destructive acts are not tolerated." (EU 691/2010 Art. 2 k)*[192]

The legal definition contains aspects concerning inacceptable behavior and the state of professional skills. Consequently, a transparent understanding of tolerable and intolerable actions for the respective organization has to be defined accordingly. The following table summarizes three central types of action and the possible consequences in the light of endangering safe operation. Dekker (2017) distinguishes between *honest mistakes*, *at-risk behavior*, *negligence* and *recklessness*. The line between the category of an honest mistake and inacceptable (risky) actions separates the sanctioned behavior from the rather accepted.[193] The concept of Just Culture relies on inherent risk aversion, mutual trust and the commitment to a blame-free management. Insofar, intentional misbehavior or even tolerated criminal offences would harm the described fundamental basis of trust significantly.

[191] EU 996/2010 (6) explicitly declares the adherence to Annex 13. Among others, sections (3), (4), (11), (22) cover core aspects of Just Culture: *relevance of reporting (3)*, *aim: prevention of accidents and incidents, non-punitive/blame-free approach (4)*, *confidentiality and no disclosure of facts (11)*, *benefits from confidential reporting (22).* EU No 376/2014 states the full commitment and adherence to Safety Culture in section (37). The regulation complements EU No 996/2010. The document recognizes the growing complexity of aviation technology and the predicted future traffic.

[192] The definition assumes well-trained and experienced professionals and only honest mistakes will be free from punishment.

[193] Individually different perceptions of risk can lead to judgements that result in dangerous consequences which is inacceptable in contexts of Safety and Just Culture. (Dekker, 2017)

Table 23. Types of error[194]

Type of action	Description/type of error	Consequences
Honest mistake	inadvertent lapse/slip/mistake/omission, unintended, can happen to anyone in those circumstances	*compassion, investigation, learning*
At-risk behavior	a choice that increases risk, risk is not recognized or believed to be justified	*coaching, warning*
Negligence/recklessness	an active choice, consciously risky behavior, disregarding/taking of substantial and unjustified risk	*disciplinary actions, suspension, dismissal*

The individual culpability is determined on the basis of the concrete case. Accidents can occur as a result of a combination of different influencing factors, therefore, clear differentiation, separation and analysis of contributing factors are indispensable for the proper assessment of the causes.[195] In order to decide on the culpability of an unsafe act, the *Culpability Decision-Tree* and the *Foresight Test* can be applied. The decision tree consists of five questions, whereby both methods are connected in step four.

Table 24. Culpability decision-tree and Foresight test[196]

Phase	Question	Explanation
1.	**Were the actions intended?**	*action and consequence intended, possible criminal behavior (e.g. sabotage/malevolent damage)*
2.	**Unauthorized substance use?**	*possible influence of drugs/alcohol, reasons for substance abuse*
3.	**Knowingly violating safe operating procedures?**	*deliberate violation of the rules, "local working practices"*
4.	**Passing of the substitution test?**	*Connection to the* ***"Foresight Test"*** *(prior test)*
	Foresight Test question: *"Did the individual knowingly engage in behavior that an <u>average operator</u> would recognize as being likely to increase the probability of making a safety-critical error?" (different person – same error?)*	
5.	**History of unsafe acts?**	*repetitive errors, need for training*

[194] Corresponding to (Dekker, 2017, p. 2).
[195] A Just Culture decision support tool for the assessment of human failure (three steps) in the context of patient safety can be found at: VHA (2021).
[196] Corresponding to Reason in: (GAIN, 2004, p.8 pp).

The answers to the five questions determine the degree of culpability for every singular contribution. The first question focuses on the intention: "if both, actions and consequences were intended, then it is possibly criminal behavior" (GAIN, 2004, p. 8). The second question clarifies possible drug abuse or the influence of alcohol in the working space. Violating routines or practices, that have become a habit (e.g. skipping the four-eye-principle due to limited time or the lack of staff), represent the third question. The fourth step is the connection to the "Foresight test" and poses the question of substitution: *"Could a different person (well-motivated, equally competent, and comparably qualified) have made the same error under similar circumstances?"* (GAIN, 2004, p. 9). In the case of a positive answer, the person would be considered *not* being culpable. The last question aims to clarify a potential history of unsafe acts of an employee. If the answer is yes, then additional training is recommended. These tests represent a concise guideline for evaluating the individual accountability.[197] The practical application is indeed more complex, but the questions serve as a general orientation.[198]

As mentioned before in the preceding sections, the fields of aviation and healthcare have implemented the concept of Just Culture and the required **reporting systems** exist as well. In order to meet the requirements of confidentiality, the established reporting systems abstract from the particular error and feed the database only with essential key data.[199] The advantage of the available online reporting systems is their effortless use.[200] Similar to the healthcare sector – with the implementation of the *Critical Incident Reporting System (CIRS)* in Germany, Austria and Switzerland – the concept of institutional reporting exists in aviation, where its origins are located.

ECCAIRS, ADREP/ICAO reporting and the reporting system of the U.S. National Transportation Safety Board (NTSB) provide web-based portals for reporting civil aviation incidents and accidents. The received information becomes part of comprehensive

[197] Just Culture is embedded in national judicial systems. These set the benchmarks of prosecution. Legal consequences depend on domestic regulations and on the particular implementation of Just Culture in the respective organization. Prosecution and punishment are not conceptually excluded, when it comes to criminal acts. Misconduct is also not tolerated by any means.

[198] The discussion in the literature about how responsibility for human failure should be treated comprises (besides the application of culpability tests) also positions that clearly favor punishment instead of Just Culture, because sanctioning and the general awareness of possible punishment are preferred due to the disciplinary effects.

[199] The fear of grave professional disadvantages, like the loss of licenses and the damage of reputation, cannot be underestimated.

[200] In Germany, Austria and Switzerland exists a mandatory reporting system for the healthcare sector, *Critical Incident Reporting System medical (CIRS),* since 2014. CIRS medical covers manifold branches in healthcare like hospitals, general practitioners, nursing care and pharmacies. The system is mandatory, confidential and non-punitive. It is easily accessible via internet and provides a comprehensive form for easy documentation of errors, observations, and suggestions for improvement. After submitting the report, the data is reviewed and all personal data are erased. Experts publish comments, constructive criticism and practical advice in order to learn from the occurrence. These final reports are disseminated and made publicly available. These become also part of quality management, coaching programs and safety management of the particular institutions as well.

data-bases of reports.[201] A valuable side-effect of reporting to such data-bases is the possibility of valid benchmarking.[202]

The discussion of Just Culture and (expectable) human failure sheds a light on decision-making from a result-orientated perspective. The anticipation or the fear of possible negative consequences in cases of error, influences the entire process of making choices. The negative consequences can be associated with the adverse effects of a *blaming culture*.[203] This can lead to defensive decision-making, to hesitancy, or to analysis paralysis when the decision process cannot be terminated due to extensive, overcautious appraisal processes. Similarly, the risk-averse comparison of personal benefit and possible negative consequences can influence the way, a decision is made. Such ***timid choices*** are related to loss aversion of managers.[204]

> *"Each manager is loss averse regarding any outcome that will be attributed to him. In an organizational setting, the natural feeling of loss aversion can be exacerbated by the system of rewards and punishment. Rather than solving a problem, the organizational structure is making things worse."*
> *(Thaler, 2015, p. 187)*

Insofar, a system that considers these facts can influence the climate for making choices. If the results of decisions and the process of achieving them is critically assessed, the future decision quality can be improved. Learning and change are, according to Thaler (2015), influenced by the endowment effect and the status-quo bias. Therefore, the organization should recognize and manage these tendencies – apart from only setting rules – to overcome the natural inertia to report, to learn and to change. The considerations showed, that the holistic Just Culture approach requires sincere, ethically correct commitment on all hierarchical levels.[205] Insofar, decision-making can benefit from its advantages only when it is embedded in a just framework.

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[201] See NTSB (2024) for details about the process of publishing reports.

[202] Examples: With regard to technical issues, manufacturers, airlines and maintenance can, for example, review the number of engine shutdowns and derive conclusions. In doing so, safety can be critically analyzed, and collected data can serve as a source for prediction (predictive maintenance planning). Cases of human error of flying personnel can be an indicator for the need of additional training, initial problems with newly implemented technologies or further investigations of health issues like the effects of fatigue.

[203] With regard to the cross-cultural dimension of punishment (blaming etc.), the possibility of face-loss cannot be underestimated. Also, the appropriateness of open criticism can differ significantly depending on the involved cultural context.

[204] Thaler (2015) illustrates a *timid choice* of a manager as follows: "He said that if the project was a success, he would probably get a pat on the back and possibly a bonus […] But if the project failed, he thought there would be a decent chance he would be fired. He liked his job and didn't want to risk it […]" (Thaler, 2015, p. 188).

[205] Bazerman (2011) discusses critically the sincerity and value of positive rewards of organizations, when these are implemented in order to foster desired behavior. Thereby, employees might behave in the desired way primarily for being rewarded, and not because the respective values are internalized. In consequence, this might lead to adverse behavior.

To sum up, Just Culture is a relevant concept, aiming to balance a complex system of overarching safety-interests, practical work, human behavior and operational flexibility. Human actions are also under the influence of circumstances that are outside the control of the person involved, and occurring errors have to be treated accordingly. Insofar, the sharp distinction between honest mistakes and intolerable behavior is an essential precondition for the Just Culture approach. Then, the concept is effectively capable to reconcile both: justified interests like fair sanctioning of intolerable behavior and ensuring a blame-free reaction to honest mistakes. As seen, the success of the concept depends heavily on the contribution of all involved parties. Also, with regard to decision-making, the approach is capable to support deciders. The tolerance of the concept towards honest mistakes, can relieve deciders from the fear of punishment and influence the entire process in a positive manner. The opportunity of reporting failure anonymously, can contribute to improved decision quality without personal and professional stigmatization.

5.4 Military decision-making

Similar to the previously presented approaches from civil aviation and healthcare, military approaches of decision-making are characterized by their particular environment of application. Apart from obvious differences between the professional disciplines, there are essential commonalities regarding the high responsibility of the decider, a clear (hierarchical) organization and allocation of tasks, the presence of ethical concerns, the effects of significant constraints, work under complex and rapidly changing circumstances, required technical skills and specific knowledge. In order to illustrate the related methods and particular idiosyncrasies, two prominent methods of US American provenience to structure the decision process – the so-called MDMP and the OODA loop – are presented and discussed in this section.

The literature distinguishes between two general types of decision processes depending on the particular military context. Insofar, one type refers more to concrete tactical situations in combat and the other type meets rather the requirements of the thorough military planning process. Similar to the previous contexts of aviation and medicine, the question of professional intuition – and how to build it – is also crucial in military deciding. The aspect of intuition is often discussed in the literature with regard to the impressive speed of profound individual judgments compared to rigid and comprehensive processes; often the former is associated with the imagination of an omniscient, lucid military genius.[206] Insofar, authors like Davis et al. (2005) and Shoffner (2000) argue, that approaches like intuitive or natural decision-making are relevant to complement the predominant rational understanding of judgment. This would also contribute to higher flexibility and adaptability in deciding. Though military decision-making has a long tradition and therefore relies on established, workable ways of proceeding, the manifest changes over time like considerable technical developments, grave geopolitical shifts, multinational military cooperation and societal changes have to be acknowledged and taken into consideration as well.

The military context is characterized by a high amount of uncertainty, insufficient predictability, incomplete knowledge and insecurity which can be summarized as the so-called "fog of war". Though, this pervasive metonymic expression is usually attributed to von Clausewitz, Kiesling (2001) clarifies that this exact wording does not appear in his text *"On war"*.[207] In chapter 3, von Clausewitz speaks rather of *fog of a*

[206] See also: von Clausewitz (1873) for more details about "the genius for war".

[207] Also, the original German version of the text "Vom Kriege" does not contain an equivalent of the expression „fog of war". Insofar, the well-known English phrase does not result from an imprecise or erroneous translation from German. The original and the English translation could be interpreted as a more poetic idea of a *fog of uncertainty*.
See also the original text: "Der Krieg ist das Gebiet der Ungewißheit; drei Vierteile derjenigen Dinge, worauf das Handeln im Kriege gebaut wird, liegen im *Nebel einer mehr oder weniger großen Ungewißheit*. Her ist es also zuerst, wo ein feiner, durchdringender Verstand in Anspruch genommen wird, um mit dem Takte seines Urteils die Wahrheit herauszufühlen."
English translation: "War is the province of uncertainty: three-fourths of those things upon which action in war must be calculated, are hidden *more or less in the clouds of great uncertainty*. Here,

more or less great uncertainty. In sum, the obviously interpretative collective term "fog of war" conveys what the VUCA model similarly represents: The acronym stands for ***V**olatility, **U**ncertainty, **C**omplexity* and ***A**mbiguity*. – This model, stemming from the US Army War College, describes the perception of the fundamentally changed situation after the Cold War in the 1990ies. – Regardless of the conceptual designation, environments that are perceived as VUCA and their incessant change, require permanent attention and high situational awareness. Insofar, careful observation, rapid perception and the correct management of information under stress and time pressure are essential. Aspects like a competitive advantage, technical edge, and expertise are not less relevant. In particular, the technological progress becomes increasingly influential for the way how decisions are prepared, made and executed. These technical aspects comprise inter alia the reliable supply with robust data, refined equipment, assistance systems, AI support and automatization. The scope of the technical contribution – like the integration of AI – and the role of the human decider require beforehand a profound consequential clarification and an open societal discussion regarding the inherent ethical dimension.[208] Often, parliamentary discussion, dispute, democratic decision and control represent the societal (temporary) consensus regarding such ethically disputable matters.

The MDMP

The Military Decision-Making Process (MDMP)[209] represents a comprehensive methodological approach for planning, coordination, preparation and execution of military decisions with US Army provenience.[210] The MDMP Handbook deals with the process in detail and explicates as follows:

> *"The MDMP is an iterative planning methodology that integrates the activities of the commander, staff subordinate headquarters, and other partners to understand the mission, develop and compare courses of action (COAs), decide on a COA that*

then, above all a fine and penetrating mind is called for, to grope out the truth by the tact of its judgment." (von Clausewitz, 1873, book 1, chapter 3 "The genius of war")

[208] The broad topic of political decision-making and the influence of players like the defense industry and NGOs on decisions, though highly interesting and important, are not part of this work.

[209] See also: Davis et al. (2015), Kuczynski, G. et al. (2023), Reese et al. (2015), Shoffner (2000), Schultz (1997), Sjøgren (2022) and Kalbfus (1942) for in-depth information about the MDMP.

[210] Marginal note: Although there is no common international approach for military decisions, commonalities can be identified between different models. For example, the German armed forces employ the systematic approach of the leadership process (Führungsprozeß). (see: Weyland, 2022) Regardless the differences, the underlying structures resemble each other. As a matter of fact, the general familiarity with different approaches is of practical relevance for cases when armed forces interact and cooperate on an international level and the different national systems come together.

best accomplishes the mission, and produce an operation plan or order for execution." (Reese, 2015, p.7)

According to the described intention, the MDMP is subdivided into seven consecutive phases. Additionally, three warning orders (WARNORD) are part of the process.[211] At first sight, it is obvious that the MDMP is centered around a mission and the identification of the adequate CoA, which requires considerable effort in planning and preparation. The process therefore involves and coordinates a larger group of people on different levels, with specific tasks and capabilities. Also, the seamless flow and the correct form of information is clearly organized according to demand and hierarchy. Therefore, the phases of the process are clearly prescribed, interconnected and built on the output of the preceding phase. In order to gain a general impression of the considerably complex process, Table 25 summarizes and describes the stages briefly according to Kuczynski et al. (2023) and Reese et al. (2015). The seven individual stages contain derived, subordinated processes and sub-steps. For the purpose of providing only a general overview of the approach, the reduced presentation shall suffice here.

*Receipt of **M**ission (1) – Mission **A**nalysis (2) –*
*CoA **D**evelopment (3) – CoA **A**nalysis (4) – CoA **C**omparison (5) –*
*CoA **A**pproval = **Decision** (6) – Orders **P**roduction (7)*

As mentioned before, three of the seven phases *(1, 2 and 6)* are completed by **WARNORD**s. These warning orders contain the phase's results in an aggregated form and deliver essential information for subordinate and supporting units. They are part of the stage's required output and represent the closing step of the respective phase. At the same time, the WARNORD is the prerequisite for the subsequent phase.

In general, the MDMP is centered around systematically approaching a decision on a particular CoA, which is supposed to fulfill the mission's requirements best. The process represents a joint effort across multiple levels and begins with the **Receipt of Mission**. The phase's purpose is to create conditions for successful planning and comprises the initial assessment of the current state and the collection of relevant information. This step leads to the first WARNORD, containing the commander's initial guidance. The following phase of **Mission Analysis** continues with the assessment of the situation (constraints, risk assessment) and aims to achieve a better understanding of the operation's purpose. Further, tasks are identified respectively. The second WARNORD concludes the step and conveys the relevant updated information. Based on the Mission Analysis, the process continues with the **CoA Development**. In this step, focus is put on the generation of options that can be analyzed and compared in the subsequent stages. This preparatory phase serves also as a point in time for the assessment of the relative combat power. Result of this third phase is the development of the broad concept that includes the set of generated alternatives. The next phase creates through **CoA**

[211] The acronym MADACAP (see above bold capital letters) serves as a mnemonic for memorizing the MDMP's individual phases.

Analysis/Wargaming an even more refined picture. The structured, rule based analytical procedure of wargaming simulates, tests and assesses the results of the developed CoA alternatives aiming to specify the recommendations for the commander. Additionally, CoA Analysis is applied in order to identify probable consequences associated with each CoA and to detect frictions, difficulties and planning problems. Further, the synchronization of activities, the assessment of combat power and resources, and the identification and mitigation of risks are of relevance. The ensuing **CoA Comparison** represents the evaluation of each CoA against predefined criteria resulting in a recommendation by the staff for the commander. The preferred CoA with the highest probability of success represents the input for the **CoA Approval** phase. At this point, the commander approves the recommended CoA and the **Decision** is made. (Of course, the commander can reject all recommended CoA. In this case, the CoA development has to be repeated again. If the commander modifies a possible CoA, or introduces a new one, then a de novo procedure of development, analysis and presentation is required as well.) After the approval of the preferred CoA the final planning guidance is issued. The third WARNORD, containing all relevant and updated information, is distributed and concludes the decision phase. The final stage of the MDMP represents the **Orders Production**. Hereby, the transition from planning to preparation takes place, and orders are issued respectively, whereby focus is on the completion of the plan. Hereby, it is crucial to ensure understanding of all involved before the execution of the plan or order.

As seen, the MDMP represents a rigid, orderly, linear – and insofar predictable – procedure in a context of insecurity, ambiguity and uncertainty. The described stages are mandatory and interconnected with each other. Insofar, there is little flexibility in the prescribed outer structure. How the MDMP is actually *lived* and the stages are filled in the concrete situation, may differ depending on the commander and the staff involved. Since a larger group of people works together in the process, the structure supports coordination, uniformity, clear communication channels and control. The MDMP is characterized by its hierarchical organization. That means the clear allocation of power, the assignment of roles and responsibilities and the formal authoritative structure to delegate tasks and to issue plans or orders. Further, the decision process is continuously documented and intermediate results, updates and important stages are communicated. Throughout the process, reassessments, updates and refinement of information can be observed. This reflects the ongoing requirement of situational awareness and understanding. Therefore, the process is accompanied by information collection, analysis and intelligence preparation of the battlefield.

Shoffner (2000) mentions an important aspect of the MDMP: The method is particularly suitable for being taught in the classroom which is not the case for every existing decision-making technique.[212] In general, the fact of solid education and training in decision-making is of relevance, because competent cooperation in the decision-making process requires a sound understanding of the MDMP's functioning. Therefore,

[212] In sum, it is important that the process cannot only be taught, but can also be learned and applied. Learning involves gaining experience over time through training and practice. It finally depends also on the personal capabilities of the student.

training creates shared awareness, a mutual language, enhances collaboration, division of labor and facilitates indispensable professional teamwork. These aspects are indeed of relevance, since lives can finally depend on them.

Table 25. The phases of the MDMP (MADACAP)[213]

	Phases	**Description**
1.	Receipt of **M**ission	*Purpose: establish the conditions for successful planning* *Initiative: higher headquarters plan/order a new mission or anticipation of a new mission (e.g. based on an alert order, WARNORD or planning order)* *Sub-steps: alert of staff/relevant participants, gathering of planning tools, update of running estimates (facts, situation, risk ...), conduction of the initial assessment (time for planning, decision on planning approach, formation of the planning team), issue of commander's initial guidance → issue of initial WARNORD*
	WARNORD	*to subordinate and supporting units* *contains at a minimum: type of operation, general location of the operation, initial operational timeline, movements necessary to initiate, collaborative planning sessions directed by the commander, initial information requirements/commander's critical information requirements (CCIRs), initial information collection (IC) tasks*
2.	Mission **A**nalysis	*Purpose: assessment of the situation, identification of tasks, understanding the operation's purpose, enhancement of commander's understanding to develop intent, CoA and guidance* *Sub-steps: analysis of plan/order, determination of tasks and constraints, development of a planning timeline, preliminary risk assessment, analysis of mission variables/initial intelligence preparation of the battlefield (IPB), CoA evaluation criteria, development of initial IC plan/proposed problem statement/proposed mission statement/initial commander's intent/planning guidance, presentation of the mission analysis briefing about the results* *→ issue planning guidance, commander's intent and WARNORD*
	WARNORD	*to subordinate and supporting units, issued immediately in a concise form after the commander gives the planning guidance;* *contains: situation updates, the commander's intent, tasks and relevant changes, risk guidance, initial IC plan, IPB results, updated planning and operational timelines, specific priorities etc.*

[213] According to Reese et al. (2015, p. 8) and Kuczynski et al. (2023, p. 29).

3.	CoA **D**evelopment	*Purpose: development of alternate CoA for the commander's approval, generation of options for subsequent analysis/comparison* *Sub-steps: assessment of relative combat power (allocation, vulnerability), development of the broad concept, generation of alternatives, arraying forces (availability), assignment of headquarters, preparation of statement and sketch, CoA briefing*
4.	CoA **A**nalysis (War Game)	*Purpose: identification of probable consequences, frictions, difficulties, planning problems, refinement of each CoA, synchronization of activities, assessment of combat power and resources, identification and mitigation of risk, update of assumptions* *Sub-steps: structured, rule based wargaming/simulation and assessment of the results → refinement of CoA, development of recommendations about the best CoA, optional briefing*
5.	CoA **C**omparison	*Purpose: evaluation of CoA independently and against set criteria, cost-benefit-analysis, identification of the most suitable CoA for recommendation and selection (highest probability of success)* *Sub-steps: structured analysis of advantages/disadvantages, comparison of CoA, **CoA-decision briefing** to the commander* *→ recommendation of preferred staff-CoA*
6.	CoA **A**pproval = ***Decision***	*Purpose: CoA-**Decision** and direction of resources to the best CoA.* *Sub-step: Commander approves a CoA after the decision briefing. (If the commander rejects all CoA, CoA development starts again. If the commander modifies, or gives a new CoA, then new development, analysis and presentation of recommendation are required.) After approval the final planning guidance is issued. (includes risk acceptance) Commander's decision/CoA approval + final planning guidance → issue of WARNORD*
	WARNORD	*to subordinate headquarters* *contains: area of operation, mission, commander's intent, principal tasks of subordinate units, final timeline for operation, updated task organization, necessary graphics, additional instructions etc.*
7.	Orders **P**roduction, Dissemination and Transition	*Purpose: Completion of the plan, issue of the order, ensure understanding by subordinates and supporting units* *Sub-steps: production and dissemination of orders, transition from planning to preparation (plans and orders reconciliation, plans and orders crosswalk) → results in approved operation plan/order by the commander; aim: subordinates understand the plan/order before execution, confirmation briefings, transition: shift of responsibility of controlling the execution to the current operations cell*

The ensuing table gives an overview of the roughly estimated time consumption of the individual phases in relation to the duration of the complete MDMP. The table illustrates, that the extensive and thorough preparation of the decision requires at about 50% of the time of the process. As seen, the step of CoA Approval represents the decision for the *one* preferred CoA. This means at the same time that the set of all other developed CoA is rejected. Shoffner (2000) notably criticizes the considerable amount of preparatory work that is simultaneously discarded by the choice of one option.

Table 26. Estimated timelines for the MDMP[214]

	Phase of the MDMP	**Estimated overall time allocation**	**Estimated refined time allocation**
1	Receipt of mission	50%	30 – 35%
2	Mission analysis		
3	CoA development		15 – 20%
4	CoA analysis	50%	30 – 35%
5	CoA comparison		
6	CoA approval		
7	Orders production		15 – 20%

As seen, the MDMP is a complex, time-consuming procedure with a prescribed rigid structure. In the light of von Moltke's words "no plan survives the first shot", it is worthwhile, to reconsider the procedure's effectiveness.[215] Shoffner (2000) explains with reference to the MDMP that "despite extensive work by the staff, many plans are discarded as soon as an engagement begins. […] [A] tactical plan is useful only if it can adapt to the dynamic nature of the battlefield. A significant shortcoming of the MDMP is that it is rigid, inflexible, and does not adapt well to 'rapidly changing battlefield conditions'" (Shoffner, 2000, p. 1). Additionally, he criticizes the reductionist nature of the procedure, since it leads to the concentration on only one CoA, even if other adequate alternatives are present or emerge. Regarding the required time, he states, that "[i]n fact, many commanders realize that the process consumes a tremendous amount of time and abandon the process altogether" (Shoffner, 2000, p. 19). As a result of his considerations, he does not recommend the renunciation of the process, but rather suggests adjustments in order to increase adaptability, flexibility, effectiveness and the quality of the output in general. Therefore, Shoffner (2000) evaluates the possible contributions of approaches like *Naturalistic decision-making* (NDM) or the theory of *Bounded rationality*. As mentioned before, the naturalistic approach views decisions embedded in their specific environment and observes the circumstances as they change

[214] According to Kuczynski et al. (2023), p. 28.
[215] The original version of von Moltke's adage from 1890: "Kein Operationsplan reicht mit einiger Sicherheit über das erste Zusammentreffen mit der feindlichen Hauptmacht hinaus."

and unfold naturally. Emphasis is not put on extensive analysis and comparison, rather "the model seeks to understand the environment as a whole and changes, as they occur, add to this understanding" (Shoffner, 2000, p. 22). The decision-maker is encouraged by the NDM model to be creative and to decide more intuitively. This means, that in consequence choices are made quickly. Undoubtedly, the quality of the result can suffer from this way of proceeding, but the naturalistic perspective tolerates mistakes and encourages learning from failure. In the context of military decision-making, Shoffner (2000) is – besides the discussed advantages – skeptical concerning the applicability of the naturalistic approach. His rationale refers on the one hand to the difficulty to teach the method and on the other that the forgiving error culture might lead to undesired results. The concept of *bounded rationality* acknowledges the lack of sufficient information and the limited capacities of the decider, and yet a decision has to be made. This is facilitated by pattern-recognition which leads to a heuristic decision. Not achieving the optimal choice is the primary goal, rather a (quick) decision that satisfices is sought. Shoffner (2000) recognizes in particular the relevance of professional experience and intuition in the model of *Recognition primed decision-making* (RPDM).[216] Resulting from the reliance on intuition, the decision time decreases significantly compared to extensive comparative CoA-analysis. Another advantage of RPDM is the direct responsiveness to changes of the battlefield situation or to new circumstances in the environment. But, regarding the complexity of military operations, Shoffner (2000) considers the model to be inadequate specifically for cases that indeed require detailed and thorough preparation. Concerning the aspect of education, he explains that intuition can hardly be taught in a classroom setting.[217] Intuition is built by accumulating experience over time. In this context, he mentions *tactical decision games* (TDG) as a useful instrument for training and instruction, without being in a dangerous combat situation.[218] Sjøgren (2022) refers to the downside of the application of simulations and remarks that "there is a danger that commanders and their staff learn to play the game and thus optimize their performance towards playing the game rather than fighting a battle" (Sjøgren, 2022, p. 387). Therefore, simulation and free exercises together are recommended for improving intuition.

After having compared the mentioned methodical alternatives to the established MDMP, Shoffner (2000) concludes that a single approach that fits the military realm best does not exist. He repeatedly emphasizes the weaknesses of the MDMP and recommends firstly, that the process should rather be a "tactical planning process" aiming to develop a coherent workable plan (with contingency planning) instead of following an inflexible, inefficient linear process. Secondly, he argues, that a paradigm shift is

[216] Shoffner (2000) remarks that "the risk inherent in this method is that if the decision-maker (the commander) is inexperienced, he may lack the background for sound intuitive judgments" (Shoffner, 2000, p. 25).
[217] The US Marines apply simulations with tactical decision games (TDG) for teaching purposes. Intuitive decision skills are trained repetitively in a gaming environment with a specific task to be solved in a certain period of time. For more details about TDGs see: Schmitt (2019).
[218] Davis et al. (2005) also recommend TDG for (peacetime) educational purposes in addition to regular training in order to develop professional intuition. With regard to improving skills, the authors explain that "[a] soldier who has failed in real training may prepare for his next attempt by working through corresponding processes in the computer game" (Davis et al., 2005, p. 45).

required in the military education system in order to prepare students adequately for planning tasks and competent decision-making.

Davis et al. (2005) contribute to the discussion of a change in military decision-making with the recommendation to reconcile analytic and intuitive considerations. Similar to Shoffner (2000), a paradigm shift is proposed by the authors, since Davis et al. (2005) also recognize the requirement of higher flexibility in military decision processes. The authors justify the argumentation with "[…] the increased appreciation for uncertainty and the infeasibility of getting plans 'right' in cases where events are simply not very predictable, modern decision science tends to emphasize planning for adaptiveness" (Davis et al., 2005, p. xvii). The proposed understanding of flexibility and strategic adaptiveness in decision-making is clarified as follows:

> *"This does not mean that planning is useless; rather, it means that an explicit concept in strategic planning should be building in the flexibility to permit adaptations. […]*
>
> *Such considerations suggest a broad approach in which planners recognize explicitly that decisions now are not necessarily forever and that changes will be needed. This can be liberating, because it can permit decisions that move in what is believed to be the right direction, without overcommitting." (Davis et al., 2005, p. 61)*

Sjøgren (2022) contributes to this topic with the results of interviews with experienced commanders. General Petraeus answers regarding strict adherence to the MDMP:

> *"We religiously followed the MDMP, though we did compress it on fast-moving situations. We did not skip any step, particularly the briefing on the COAs the staff should wargame […] In the end, I chose the COA that most effectively would accomplish the tasks and associated purposes in the missions assigned to us." (Petraeus in: Sjøgren, 2022, p. 388)*

Insofar, the plan is not seen as a sheer scripted procedure, rather as a framework for thinking, a helpful construction that organizes a complex mission. The correct and thorough application shall therefore ensure that "every aspect of an operation is considered, securing a coherent and shared understanding of the situation" (Sjøgren, 2022, p. 388). Following *all* steps of the MDMP creates confidence in the preparation, whereas the omission of steps might lead to missing opportunities. Sjøgren summarizes as follows:

> *"The goal is a common point of reference or a common understanding serving as a foundation for action improvised in response to the situation's inevitable changes. This common understanding allows for delegation of decision-making authority*

[…] The goal is to subvert an adversary effectively."
(ibid., p. 388)

This argumentation for flexibility – and thereby having a margin for improvisation and surprise – is strengthened by the fact, that actions might become predictable for the adversary. Sjøgren (2022) suggests instead of sticking to doctrine and SOPs (standard operating procedures) "a balanced approach, which means commanders become aware of both the strengths and limits of the procedural approach. […] Militaries also struggle between balancing an instrumental approach, required for interoperability, the facilitation of coordination, and efficiency, against the need for flexibility, creativeness, effectiveness, and decentralized decision-making" (ibid., p. 385, 382). Insofar, military professional doing is characterized by adherence to the established processes, routines and doctrine on the one hand, but on the other by their flexible interpretation.

The more flexible perspective on the rigid structure also integrates *capabilities-based planning* (CBP) in order to adapt the process better to the particular situation. This mirrors the available capacities and includes financial or generally resource-related constraints (e.g. budget or mission capacity). Being clear about existing constraints or boundaries, adds a more realistic assessment of feasibility to the plan. Other influencing factors have to be taken into consideration not less seriously: This includes among others possible time pressure, the level of emotional distress of the decider, reliability and quality of available data.[219]

Significant influences on decision-making can be observed – similarly to the previous discussion of decisions in the fields of healthcare and aviation – resulting from the occurrence of biases. Therefore, Davis et al. (2005) emphasize the importance of being aware of biased thinking and consequently suggest ways to reduce or eliminate the partially considerable influence of biases.[220] Soll et al. (2024) provide evidence for the effects of anchoring (a type of adjustment bias) when asking *for* advice from others.[221] (Anchoring effects on the side of the advising person can influence the recommendation as well.) As seen, the MDMP requires a significant amount of preparatory work from different hierarchical levels in order to give advice. A large portion of the process is dedicated to pave the way for the decision. Not only biased thinking during the process can distort judgment, also the effects of framing have to be considered attentively. In

[219] For more details see: Davis et al. (2005, p. 90 pp).
[220] The authors do not discredit biased thinking. They rather recommend attention, awareness of biases and teaching strategies in order to understand, handle and prevent this facet of thinking. (Besides the detection of biases, it is of importance to avoid the introduction of additional, new biases.) Further, the authors recommend decision aids and preventive strategies (like composition of diverse teams, skepticism, brainstorming, discussion etc.). See: Davis et al. (2005, p. 92 pp).
[221] Soll et al. (2024) found effects of anchoring when seeking advice from others. Thereby, the crucial point is, how the question is posed: The question itself influenced the answer significantly. The anchor is set and maintained. (This aspect can, in my opinion, also be explained from a linguistic, discourse-theoretic point of view.)

consequence, these phenomena have to be expected during the process.[222] Insofar, the recommendation of a CoA to the commander is probably not free from unintended distortion. In this context, Sjøgren (2022) refers to the advantages of command climates where people are encouraged to disagree, to think in alternative ways and to challenge assumptions and accepted wisdom. He highlights the role of a trustful "contrarian" who gives the commander authentic feedback, since "they need staff officers to be vocal when they see things differently" (Sjøgren, 2022, p. 391). Undoubtedly, thoughtless, uncritical application of procedures does not contribute effectively to sound results. Also, by design, the traditional, hierarchical structures in military organizations do not strengthen the free articulation of doubt or criticism concerning the planning process. Additionally, Sjøgren (2022) mentions the aspect of performance related to staff size and explains that "[i]t is a military truism that when a staff reaches a certain size, it can generate enough work to keep itself busy. Perhaps a smaller staff would increase both efficiency and effectiveness" (ibid., p. 393). At the same time, it is obvious that increasingly complex tasks require a corresponding size of staff or technical support.

Recurring to von Moltke's adage about the limited resistiveness of plans, the following **key points about the MDMP** from the previous discussion can be summarized.

1) *Military decision-making takes place in VUCA environments.*
2) *Rigid planning does not fit the military realm. Therefore, authors recommend reasonable flexibility for the MDMP.*
3) *The MDMP can benefit from a command climate that encourages constructive feedback and the critical discussion of plans and assumptions.*
4) *The human factor ("humans fight wars") is central for military decision-making. This relates to human flaws, limitations, biases, vulnerability, attitude towards risk, teamwork etc.*
5) *Military decision processes require ethical thinking and clarity.*
6) *Intuition and its development are essential for sound professional decision-making. (Experience – not procedure – creates expertise and intuition.) Education, free exercise, training, simulation, learning from mistakes and open exchange can effectively contribute to the development of intuition.*
7) *The process benefits from technical support regarding e.g. data collection and analysis in order to gain adequate situational understanding and to achieve/sustain a certain degree of situational awareness. Uncritical routine tasks can be reliably transferred to machines (AI). Virtual collaboration and remote teamwork are valuable components of the process. Also, the educational part can be technically complemented (simulation etc.).*

[222] Sjøgren (2022) remarks, that "[…] certain positions within the staff often aligned with rank decide what gets pushed up through the chain of command and what does not" (Sjøgren, 2022, p. 391). Insofar, the selective presentation of information has to be considered as well.

Notwithstanding the potential ephemerality and limited validity of (precisely and diligently developed) plans, the MDMP represents indeed a valuable mutual reference point and framework for thinking. As mentioned before, the established structure is valuable for maintaining an overall view and facilitates the delegation of tasks and coordination. As mentioned before, the MDMP and all of its seven steps are – regardless of its criticized inflexible structure and inherent limitations – considered to be appropriate for its purpose.

The OODA-Loop

The OODA loop is a concept for decision-making with roots in military aviation. It was developed by John Boyd decades ago in the 1950ies, but remains timelessly relevant even under the significant developments in warfare and technically assisted military decision-making.[223] The technological progress and the acceleration in data processing did not affect the structure in general, but undoubtedly facilitated a more efficient and faster proceeding.[224] Clearly, not only time, but also the competent and expedient completion of the loop are crucial. The acronym ***OODA*** stands for the four stages of the process.

O*bserve (1)* – ***O****rient (2)* – ***D****ecide (3)* – ***A****ct (4)* – *Feedback [5]*

These phases are completed with the usually uncounted, but not less important fifth step of **f**eedback, which represents the control and assessment of the result. The evaluation of the chosen course of action determines whether the procedure is finished or if it has to be repeated. If the mission was not successfully accomplished or if significant changes occurred, the process has to be initiated from the Observation phase once again. The OODA loop terminates only, if the feedback to the phases Decide/Observe is positive. The procedure is not limited to the application by a single person.[225] The results can indeed benefit from cooperation, collective knowledge, division of labor and shared situational awareness. Table 27 systemizes and describes briefly the phases of the OODA loop as follows.

[223] John Boyd developed this decision aid based on his own experience as an outstanding Air Force fighter pilot in the Korean War. He is also known as an influential strategic thinker and military theoretician. See also: Vanslambrouck (2012) for more details about Boyd.
[224] Curts et al. (2001) remark that „[t]echnology has the ability to mature the concept of the OODA loop far beyond what Boyd had ever envisioned "(Curts et al., 2001, p. 3).
[225] Boyd refused a dogmatic attitude towards methodical approaches. Insofar, contrary to Shoffner's view, the OODA loop can also be performed as a team. (See: Shoffner, 2000, p. 36)

Table 27. The phases of the OODA loop

	Phases	Description
1.	**O**bserve	*observation of the surroundings (sensual perception)* *identification of the problem/threat, unfolding circumstances* *interaction with the environment, monitoring of changes*
2.	**O**rient	*Analysis, contextualization and synthesis of observations, previous experience and new data, consideration of capabilities and capacities* *Important: information is evaluated – "filter" of experience/knowledge*
3.	**D**ecide	*test, actual implementation of the decision, action*
4.	**A**ct	*selection of the adequate option that balances risks and benefits best*
(5.)	Feedback	*to the phases **D**ecide and **O**bserve* *Are the results satisfactory? Is the situation stable?*
		If yes → Terminate the process.
		*If no → Repeat the loop: return to the beginning and **O**bserve again.*

The process has a linear structure with consecutive phases. The duration of the process is not necessarily extensive. It depends on the complexity of the task and on the intuition of the deciding person. The latter can shorten the process considerably.[226] Even a thorough completion of the OODA loop – like any other decision method – results in a decision that is not free from limitations and flaws. The effects of vague estimations, residual uncertainty, incomplete information, limited knowledge and the influence of the human factor inevitably determine the quality of the outcome. The mentioned imagination of the "fog of war" primarily reflects these hurdles which are predominantly associated with the Observe and Orient phases. In addition, technical and mental processing speed, quality and quantity of information are crucial parameters also in military deciding. [227, 228] This relates directly to Herbert Simon's argument of bounded rationality: Undoubtedly, the human and technical contributions to the decision-making

[226] In particular, the research of Klein (1999, 2004) is centered around rapid and intuitive decision-making of professional experts (i.a. firefighters, platoon commanders, healthcare workers).
[227] Curts et al. (2001) emphasize the relevance of adequate data management: "One can sense that the OODA loop cycle would be slowed by a growing deluge of data that are insignificant or not applicable to the task at hand" (Curts et al., 2001, p. 3).
[228] The Hick-Hyman Law helps to explain the nexus of the number of options and time consumption in decision-making processes. The more options are available, the more time is required for making the actual choice. In cases of time criticality, the stimulus-response-time is of crucial importance. See also: Nikolov (2017) for vivid examples.

processes suffer from inherent limitations regarding capacity and quality. Concerning the improvement of the human contribution, education, guidance, teaching and training are effective measures. As seen, the MDMP represents an integral part of military education. Regardless his critical argumentation, Shoffner (2000) acknowledges the general suitability of the MDMP for being taught in the classroom. But, according to the assessment of Gary Klein, Shoffner (2000) concludes too, that the OODA loop is unsuitable for teaching purposes. His explanation also follows Klein, who argues that the OODA loop "[…] encourages intuition, it encourages sizing up the situation and reacting in accordance with learned patterns, as opposed to painstaking analysis" (Shoffner, 2000, p. 35). Insofar, the OODA loop is certainly valued by both authors for its explanatory strength, but both conclude that expertise in decision-making is not gained from the application of models: Expertise arises from experience.

Meanwhile, technological advancements indeed improve the technical contribution to the decision process. Big data and AI are among others important topics with increasing relevance for decision-making in general. The integration of AI is capable to compress the OODA loop to a minimum of time whilst processing rapidly big amounts of information. That is why, Anderson et al. (2017) consider these developments to be a "new paradigm of warfare" (Anderson et al., 2017, p. 29). In this regard, Anderson et al. (2017) anticipated, that AI will be part of the OODA loop and complement, replace or automatize the human contribution: "While humans will continue to provide high-level input, machines will take over the decisions in planning and execution" (Anderson et al., 2017, p. 28). Key arguments for this development are on one hand limitations of the human factor and on the other hand specific, powerful capabilities of machines. The authors highlight the extraordinary speed compared to human information processing and reaction time. As mentioned before, human performance is prone to deteriorate under the influences of stress, distraction, adverse environmental factors, fatigue or illness. Despite the obvious limitations of machines – such as technical errors, dependence on energy supply, target of cyberattacks, errors at the human interface – they can cushion the effects of human deficiencies. For those reasons, Anderson et al. (2017) consider AI to be a capable support for supplying the decider with prepared information in order to accelerate the decision process. Undoubtedly, any available information is worthless if it cannot be interpreted and applied adequately; its particular added value is revealed through targeted analysis. Especially in the Observation and Orient phases, the gathered data is a prerequisite for attaining an appropriate level of situational awareness, which is fundamental for the entire loop. Regardless of Shoffner's focus on the conduction of the OODA loop by a single person, complex operational situations truly benefit from cooperation in a team. In consequence, the acceleration in the stages of the OODA loop – by experience, teamwork and technical support – allows earlier and deeper concentration on the decision itself, creates valuable capacities for the decider and finally facilitates taking faster appropriate action. To sum-up, the OODA loop can benefit from additional technical support and advantages can be achieved in a process that is oriented on an adversary by a significantly higher processing speed and reduced

reaction time.[229] Further, situational awareness can be enhanced with sophisticated technical equipment, like e.g. for aviation integrated head-up displays (HUD) or built-in night-vision goggles (NVG) for helmets. HUD allow the pilot to literally keep the eyes out and the head up. Specific NVG allow flights under adverse conditions during nighttime. Insofar, reduced reaction time, safer conditions and better information create a competitive advantage. So-called manned-unmanned teaming (MUM-T) can also enrich the decision-process with information and improve the situational awareness with the help of several coordinated unmanned aerial vehicles (UAV).[230] Drones are controlled from an aircraft/helicopter and thus complete and enhance the observational capacities of the crew.[231] Schulte (2019) describes this approach of "Dual-Mode Cognitive Automation" as a kind of human-machine division of labor. Tasks, that are usually performed by a person are transferred to machines – so-called *artificial cognitive units* (ACU) – in order to reduce the human workload and to improve situational awareness. This can be done in two ways ("dual mode"): firstly, the human delegates tasks in a hierarchical framework ("supervisory control") or secondly, the human and the ACU interact on a rather equal level ("cooperative control"). The support of MUM-T is valued in too dangerous situations or tough-to-access areas. Besides the military use, also rescue missions (e.g. SAR, firefighters) can benefit significantly from additional MUM-T support in order to save resources and lives.[232] It is not new, that technological developments from the military sphere spill over after a certain time to other fields of application.[233] HUD are nowadays established e.g. in the automotive industry and in commercial aviation.[234] As seen, technology can contribute effectively to better situational awareness. Reaction times can be reduced and even a portion of workload can be transferred to technical aids.

The described advantages of the technical contribution for approaching (faster and more precise) military decisions cannot be separated from ethical considerations. The allocation of ultimate agency is (still) seen in the sphere of the human decider. But, with regard to the OODA loop, Anderson et al. (2017) presume, that "[d]ue to the speed of

[229] In the context of collection and interpretation of raw data, it is important at the same time to gain knowledge superiority and to prevent information overload. Both aspects facilitate sound decision-making. Analysis-paralysis due to information overload inhibits any effective decision. Purposeful, task-oriented preparation and comprehensive presentation of data saves time and preparatory work. Concentration on the decision itself increases the probability of a good choice.

[230] Iriarte (2019) argues that „[b]y adding the eyes and ears of UAS to their battlefield picture, pilots can grow the reach of their situational awareness and improve safety " (Iriarte, 2019).

[231] Undoubtedly, the additional and considerable workload of controlling UAV requires qualified and trained personnel in order to harness the potential of the technical equipment.

[232] See also: e.g. Airbus (2020, 2022) for capabilities of MUM-T.

[233] For example, the protection of civil airliners against MANPADS is generally possible, but often too expensive in the light of the industry's cost pressure. Usually, alternate, safer routes are an option to save cost and mitigate the risk when flying over known areas of conflict. Wehrtechnik (2022) reports about the integration in civil aviation (e.g. Israeli airlines, VIP customers) besides originally military purposes.

[234] See Globes (2003) for equipment of civil cargo aircraft with enhanced vision HUD.

machines and the volume of information they can handle, the fastest […] option will eventually be to remove humans from the loop entirely" (Anderson et al., 2017, p. 29). Therefore, it is inevitable to discuss and to define the human contribution and to set reasonable boundaries for technical aids. Far-reaching questions regarding the interruption or discontinuance of the loop, clear accountability and responsibility have to be answered in a profound and definite manner beforehand. The answers to those ethical questions would shape the entire decision process, its application and the final result significantly.

Not only the transfer of military technology, as described above, to other fields can be observed. The concept of the OODA loop was translated and adapted for the application in civil business contexts which are similarly considered to be VUCA-environments. Hashemi-Pour (2024) emphasizes the benefits for organizations that are associated with the process' clear structure, effectiveness and the orientation on competition. Particular emphasis is put on observance of the Observe and Orient phases. The relevance of awareness and proper assessment of the situation are not less crucial in entrepreneurial than in military contexts. Especially, models that relate to competitive, complex changing environments are often considered to be applicable in business-contexts.

5.5 Chapter summary – Examples of professional decision-making

This chapter dealt with approaches for decision-making from three different professional fields. All three branches – **aviation, healthcare and military** – have, besides significant differences, certain characteristics in common. The central common denominator represents the close relation of decisions to human life. Major commonalities of the branches are primarily related to making professional decisions that are associated with risk, high responsibility, complexity, uncertainty, time pressure, the presence of constraints and competition. The particular significance of professional intuition was discussed in detail as well. Therefore, it is worthwhile to identify points for sharing interprofessional experience and to facilitate exchange across branches and learning. The transfer of successful concepts was highlighted in various contexts, whereas the integration of **checklists** in medicine and aviation was described in more detail.

The section about **military decision-making** intended to illustrate the field's specifics in decision-making. Therefore, focus was put on two prominent methods: the military decision-making process, **MDMP**, and the **OODA loop**. Central aspects of the discussion were the human factor (in particular the role of intuition), a critical view on the rigidness of military processes and the technical support for improving the situational awareness and for creating a competitive advantage. Aspects of **aeronautical decision-making** were presented in order to gain an impression of the aviation-related specifics, where the general imperative of safety is omnipresent. One established method for solving extraordinary situations and approaching a decision is **FOR—DEC**. The part focusing on **medical decision-making** aimed to give an impression of how professional decisions are approached in medicine. Here, a particular idiosyncrasy is the concept of informed, **shared decision-making**. This refers to the recognition of the patient's personal contribution and active integration into the decision-making process.

As shown, all of the presented branches have developed valuable methods for problem analysis and structured, effective decision-making that meet the particular requirements in the respective fields. The particular strength of the described approaches is their capability to structure complex situations in a way that they can be managed in a task-oriented manner. Since the chosen professional spheres are comparable and have many characteristics in common, **interdisciplinary transfer of concepts, knowledge, technology and standards** is in part possible and also reasonable. Such transfers between medicine and aviation reach beyond the topic of making choices. Methods, practices and standards from aviation (e.g. sterile cockpit[235], Just Culture, standards in radio and cockpit communication) are also already established in other fields of work because of their reliability and accuracy. This does not intend uncritical and unadjusted interdisciplinary transfer at all. The specifics of the respective areas have to be considered carefully. The previous considerations emphasized also the role of the human factor and the importance of an authentic attitude towards safety.

[235] The sterile-cockpit-concept stands for a structured working place that is supposed to be free from distractions and disturbances. (like: negative effects of disorder, noise or confusion etc.)

Clearly, the core task of aviation is the safe air transport of passengers and freight and the core element of healthcare is the patient. Insofar, an important commonality of both fields is the direct connection to human life that is in the center of decisions and therefore deserves a high level of safety. As mentioned before, both sectors operate in economic environments where competing interests between financial parameters and safety considerations exist. Therefore, it is a continuous task on many levels to balance cost and safety carefully – and to protect life. Decisions in the military field are connected to human life in a broader sense as well, but are positioned between conflicting priorities. In many dimensions, life is the center of military action. Defending human life against an opponent is one of them; protection of lives and their rescue after injuries in a conflict is another.[236] The fatal consequences of military decisions represent the opposite pole, respectively. Similar to the aviation-related considerations, spill-over effects of technology and methods from military to civil contexts can be observed analogously, because of their proven capabilities.

Part of the sections' considerations were also aspects related to the influence of the **human factor** and its inherent limitations on the quality of decisions. As a matter of fact, in particular, biased thinking, framing, human flaws and the effects of stressors and boundary conditions on performance were of interest. For all three branches, the positive effects of constructive, professional discipline and good teamwork were underlined. Additionally, decision aids, methodical knowledge, training and guidance were identified as measures to improve judgment. Particular attention was put on the positive contribution of **checklists** in aviation and healthcare. Their clear, essential advantages are related to their capability to reduce complexity (without undesired simplification) and to establish reasonable procedural standards. In addition, checklists are, as seen, capable to accelerate and to structure processes in a transparent, reproducible manner and thereby to enhance decision quality. The discussion highlighted – particularly for aviation – the essential role of teamwork and checklist discipline. The considerations clarified as well, that checklists are most effective, when they are one component in a consistent framework of organizational measures.

Regarding organizational frameworks, the implementation of the **Just Culture** concept was outlined with focus on aviation and healthcare. The holistic concept is intended to manage human failure in a professional, transparent, and reasonable manner. It is tightly associated with the motivation to learn from mistakes instead of prioritizing sanctions. Here, not only the positive effects on safety, but also on decision-making were in the center of interest.

[236] In Gawande's (2007) text the military and medical spheres are connected, as he explains how from a medical perspective care is taken of wounded soldiers.

This chapter is concluded with very diverse answers from aviation, healthcare and military to the guiding question.

What is a good decision?

"Machines don't fight wars. Terrain doesn't fight wars. Humans fight wars. You must get into the minds of humans. That's where the battles are won." John Boyd

"The way to win is to make decisions faster and more effectively than your adversary." Anderson et al. (2017)

"Good decisions = safe care." NHS (2024)

"The best and most appropriate decisions are reached when the doctor's experience and knowledge of medicine are combined with the patient's knowledge, wishes, and values." Mandell (2021)

"[…] researchers and healthcare providers have not reached a consensus on what defines a good decision, nor how to evaluate it." Hamilton et al. (2017)

"When a pilot follows good decision-making practices, the inherent risk in a flight is reduced or even eliminated. The ability to make good decisions is based upon direct or indirect experience and education." FAA (2024)

Even if a scientific consensus concerning the definition of a *good decision* is open, the answers with relation to practical deciding reflect key points of the previous sections. The quality of a decision in the military context is measured by winning the competition and defeating the opponent.[237] Thereby, the core objective is to accelerate the decision-making process as a whole, but *without* increasing the failure rate.

In essence, a decision is measured with regard to the level of achievement of the intended success and consumed time/resources. This holds true for healthcare and aviation as well. For aviation, this translates into the central criterion of "the safe conduct of the flight". Therefore, FAA (2024) emphasizes the role of risk-management and the experience of the pilot. Mandell (2021) refers to the importance of shared decision-making in healthcare. The brief formula of NHS (2024) concisely relates safety and decision quality to each other.

[237] Anderson et al. (2017) sum up: „In essence, the faster the OODA loop, the greater the advantage a military force can have over its opponent "(Anderson et al., 2017, p. 29).

6 Methodology – Description of the study

The **aim** of the qualitative online study *"Good decision-making"* was to obtain immediate information from professionals from different branches in order to clarify the earlier formulated research questions about deciding.[238] Since, decision-making represents a complex and ubiquitous social phenomenon, a qualitative approach for taking a more holistic perspective was chosen. Undoubtedly, qualitative studies have specific advantages though carry certain inherent limitations as well. Being aware of this fact, the methodical proceeding was considered to be adequate for the phenomenon under investigation. The **advantages** of qualitative approaches are their flexibility, openness for individual responses, context-richness and their capability to reflect the complexity of the social reality under investigation. The **limitations** of qualitative studies are their comparably small sample size, the difficulty to quantify facts or observations, and to express the results in formalized, numerical terms. That is why, empirical generalizations are difficult to derive; rather tendencies, relations, insights and explanations about the phenomenon can be expected as results. In my opinion, the particular value of the chosen proceeding results from the opportunity to receive subjective and more differentiated, in-depth answers with higher complexity from the participants.

6.1 Survey planning

The applied method for investigating the present subject was a study based on an online questionnaire.[239] Table 28 provides a general overview of the conducted study. The planning process included the development of an online survey, a pretest and the definition of the timeframe and the circle of potential informants. The duration of the study was five months from the first communication of the link. The group of relevant informants was defined by the first major criterion of occupation. The second criterion was the belonging to working fields that are related to potentially critical, urgent and substantial decisions. Among others, this holds true for fields like medicine or aviation.

The questionnaire was prepared with the "Google Survey" software. Requirements like a user-friendly design (clarity, easy navigation, good readability), the avoidance of distractions and an appealing visual presentation were considered seriously. The usability on different electronic devices without specific prior technical knowledge as a part of user-convenience was important, since technical hurdles might have led to discontinuation of the participation. Another aspect of user-orientation was the option to skip questions and to choose freely the preferred order of answering. The webform comprised firstly introductory and explanatory remarks from the author and secondly the set of 36 questions. The introduction was intended to explain the aim and the topic of the survey in a condensed manner. It included also the assurance of careful data

[238] I followed in particular the recommendations for qualitative studies and online questionnaires from Mayer (2009), Regmi (2016), Schauer et al. (2020), Schmidt et al. (2020), Struminskaja et al. (2018) and the USC (2024) guidelines.
[239] Link to the online questionnaire: https://forms.gle/BfvGpDKebKiLbjry9

management, anonymity and confidentiality of the answers. This first section was followed by the list of questions. In order to check the suitability, technical functionality of the questionnaire and for general feedback, a pretest was conducted. The testing served as an early quality control and thereby allowed correction or elimination of questions. The results were applied to reconsider and to improve the first version of the questionnaire. After minor amendments, the generated link of the survey was ready for distribution to potential participants.

Table 28. General overview of the study

General overview of the online-survey "Good decision-making"	
Type of study	Qualitative study based on the results of a semi structured online survey about decision-making (omission of questions was possible, open questions and flexibility regarding the answers' order, length and exhaustiveness)
Location	https://forms.gle/BfvGpDKebKiLbjry9
Duration	five months (06/2024 – 10/2024)
Number of respondents	42 (10/'24)
Target group	Diverse group of participants: Professionals from different fields (inter alia: aviation, healthcare, education, defense industry, jurisprudence, political sector), different ages and professional experiences (in years), different cultural/national backgrounds (therefore study in English)
Anonymity of probands/ confidentiality	Names of persons/institutions not obtained, no detailed personal data collected, no registration or provision of contact information for participation. Information regarding anonymity and confidentiality were provided in the introduction to the survey and always part of the personal communication.
Survey planning and technical realization	Development of the online questionnaire with the "Google Survey" software. Generation of a webform containing the questions and definition of the adequate answer types and options. Creation of a link to the questionnaire for distribution to the respondents. Answers were received directly in the Google Drive as individual/comparative results and as a summarizing overview in Google sheets and MS Excel.
Layout and usability	Emphasis on user-friendly, appealing design and a clear layout (no navigation, no distraction). Short introductory remarks, brief hints in some contexts. Convenient access with the link to the survey from common browsers also on mobile devices. Link could be opened from an e-mail, a text message or via QR-code from a printed card. No specific knowledge/technical skills required. Possibility to take breaks and to leave out questions.
Language of the study	English
Consistent data collection	Only with the latest version of the online-questionnaire (no changes of the document after publication). One uniform version for all informants.
Distribution	Communication of the survey link via personal emails, personal text messages and posting as a status notification. Distribution of printed cards with the QR-code to the survey website. Targeted address of personal contacts and support from multiplicators (with relevant contacts, snowball-system). Personal, subtle friendly reminders after the request for participation. Due to the personal distribution, contact/feedback were possible.

Topics	Personal opinions about decision quality, the significance of rationality, intuition and teamwork. General familiarity with decision methods/decision aids and application of specific methods/rules in private life and at work.
Quantity and types of questions	Total 36 questions (inter alia polar questions, multiple choice questions and open questions). Questions can be skipped.
Incentives	Not regularly, but partially small gifts (sweets, coffee).
Obstacles	Language barrier (particularly rejection from Germans: lack of language proficiency despite the general interest in participation), participants' inertia, lack of time, general hesitation to share data, surfeit/little interest resulting from too frequent requests to review products/services as a consumer.

6.2 Data collection and data management

The technical realization of the data collection and the information management were facilitated with the "Google Survey" software application. The survey platform combined multiple functions like development and location of the questionnaire, reception and individual presentation of incoming responses and generation of a structured synopsis of the obtained data. The process and the platform enabled an effective, time-saving, reliable and convenient conduction of the survey by its integrated components.

The **data collection** strategy was intentionally kept as simple as possible. The generated survey link was promoted via personalized messages (email and text message), with status notifications in a messenger application, and with QR-codes on printed flyers in the format of a business card. The cards proved to be very useful in partially spontaneous situations of personal encounters, since the access to the study was directly possible without the exchange of contact information. Further, the link was also forwarded electronically by multiplicators. These persons supported the survey with their access to potentially interesting informants. They did not receive any additional information that could influence the probands. After the initial call for participation, two general reminders were communicated via status notification. In addition, personal subtle reminders were made as well. Incentives for participation played only a marginal role in the study.[240] Insofar, concern regarding multiple responses due to attractive incentives is unfounded. Since the scope of the study with few participants is rather small, stepping into direct contact with the author was possible. Nevertheless, extensive answers to queries or comments to the questions were consequently rejected in a friendly manner. In general, the electronic questionnaire facilitated a time-saving collection of data and also the convenient participation of geographically dispersed informants.[241]

Compliance to consistency was also observed regarding two particular matters. Firstly, sometimes a printed paper version of the survey was requested. Secondly, several queries expressed the wish for a German variant of the questionnaire. Both concerns were not met in order to avoid media disruption, to maintain a uniform proceeding regarding data collection, data management and to provide equal conditions for all respondents. Additionally, a translation of the answers impairs their authenticity and represents an undesired interpretation and modification of the obtained data. The purposeful adherence to these principles led to a reduced participation.[242]

As mentioned above, **privacy and confidentiality** were observed carefully. This was realized in different ways already by design. Respondents could participate without leaving any contact information and without prior registration. Clearly, the respondents were bound to protect sensitive, work-related data. That is why, in the preparatory phase

[240] In some cases, informants received sweets or a coffee – rather as an expression of gratitude.
[241] Convenience for the user means in the present context flexible participation (time of participation/no appointment, taking pauses, individual duration, setting of choice, preferred device, privacy, possibility to skip questions).
[242] The language barrier was observed for German participants.

of the online survey, a decision concerning anonymity and confidentiality had to be made. Therefore, the chosen proceeding represents a practical compromise between the valuable opportunity of gathering information and required confidentiality. That is why, the questionnaire was developed from the start in a way that certain data, that could be associated with a concrete person, was not obtained by default. Personal information like names or gender were intentionally left out. Names of the employer or other relevant institutions were not obtained as well. This proceeding does not impair the validity of the results, since the answers could be examined and analyzed adequately: in the light of the described conscious compromise, the participants' perspective could be understood well without difference. Besides the protection of data, the informants could answer more detailed and freely due to the anonymity. Insofar, the questionnaire allowed the collection of only relevant and necessary information for the study. Another positive side-effect was, that the incoming answers did not have to be paraphrased or anonymized. Insofar, the dataset is left intact, the proceeding remains transparent, transcription errors are avoided and the authentic raw data is accessible.

Besides the described data collection, the survey platform also provided a seamless integration of the **data management**. An intact, correct and authentic dataset represents a significant prerequisite for data analysis and finally for making sound conclusions. Incoming raw data from the informants was primarily collected in the platform's inbox. The individual forms contained a list of the posed questions and the related answers. Additionally, the information was transferred automatically into a compatible database. The data could then be used as a MS Excel file. Further, a summarizing overview was also generated. The data management – similar to the part of data collection – is a vulnerable component of a study. It proved to be sound, efficient, time-saving and effective with regard to protection against data loss, prevention of modification and facilitated an organized handling of information. Insofar, the survey platform offered convenience for all persons involved, contributed to the integrity of the corpus and helped consolidate reliability and validity of the survey.

6.3 The structure of the online questionnaire

The organization of the questionnaire was predominantly based on the relevant topics and on the premise of a user-friendly proceeding.[243] The central topics can be roughly categorized as follows: personal criteria of the respondent, education, organization and decision-making. They pervade the complete questionnaire and appear depending on the context in combinations. Therefore, the sub-categories are defined by their thematic emphasis, which sheds a light on specific aspects of the main category. **Table 29** provides a summary of the categories and resulting sub-categories. Not every possible combination was considered to be relevant for the present topic. The selected sub-categories represent insofar a specific interpretation of the respective category. The classification was intended to structure the main topics and to illustrate interrelations.

Table 30 comprises all questions of the survey in their original order.[244] Additionally, the respective answering options and the thematic categories are included. After the question part, a field for personal remarks was added.[245] It was intended to conclude the survey and to give the respondents the opportunity for feedback, a personal note or to step into contact. That is why, it does not belong to the following tabular overview. In sum, the Tables 29 and 30 served both as a preparatory step and as an analysis aid for the survey. The five main categories were transferred into the questionnaire template.

[243] To keep a user-friendly design in mind, was of high importance, because the motivation to participate had to be maintained. In particular, this argument was consciously considered while choosing the type of question and setting the respective answering options.
[244] The survey is available under the following link: https://forms.gle/BfvGpDKebKiLbjry9. A pdf-version of the website can be found in the Appendices to this text.
[245] Entries in this field are not included in the materials, since they comprise partially personal messages like greetings to the author. These do not belong to the obtained data and therefore are irrelevant for the study.

Table 29. Thematic categories and sub-categories of the questionnaire

	Category Sub-category	**Explanation**	**Questions** **Nº**
P	**Personal criteria**	*age, place of residence, cultural background, personal attitudes*	1-3
PT		*personal attitude towards team work*	12
PD		*personal perspective on decision-making*	24
E	**Education**	*level of education, profession* *years of professional experience*	4-6
O	**Organization**	*General information about the professional setting*	7
OT		*Individual role/position in the team at work*	8, 11
OE		*Existence of (internal) guidelines and support, education in decision-making (how-to)*	18
OD		*Relevant types and consequences of decisions, preparation for others, type of error culture*	14, 15, 17, 32
T	**Team**	*General information about the team: structure, size, composition*	9, 10
D	**Decision**	*General opinion about deciding, rationality, revision of choices*	26-30, 33, 34
DP		*Self-assessment, self-perception as a (rational) decider, motivation, good advice for others*	13, 16, 22, 23, 25, 31, 35, 36
DE		*Education in decision-making, general familiarity with methods*	19-21

Table 30. Questions and answer types of the questionnaire

No. Cat.	Question	Answer type	Multiple choice options Short remarks
Abbreviations of answer types: **FF-L** (free form long), **FF-S** (free form short) **MC-Cn** (multiple choice/checkboxes/number of alternatives) **MC-DDn** (multiple choice/drop-down/number of alternatives) [**SR** (short remark)]			
1 **P**	*How old are you?*	**FF-S**	–
2 **P**	*Where do you come from?* *And where do you live now?*	**FF-S**	–
3 **P**	*What is your cultural background?*	**FF-S**	–
4 **E**	*What is your education level/your highest (academic) degree?*	**FF-S**	–
5 **E**	*What is your profession? What is your current occupation and position?*	**FF-S**	–
6 **E**	*Years of your professional experience*	**FF-S**	–
7 **O**	*In which branch and in which country/countries does your organization operate?*	**FF-L**	–
8 **OT**	*Are you part of a team?*	**MC-C3**	1) yes 2) no 3) sometimes (e.g. for specific projects)
9 **T**	*How many colleagues are part of your team?*	**FF-S**	–
10 **T**	*Is it a diverse team?*	**FF-L**, **SR**	*e.g. qualifications, age, languages, cultures, professional backgrounds, working experience etc.*
11 **OT**	*What is your role in the team?* *Where do you see yourself?* *Is there a hierarchy?*	**FF-L**	–
12 **PT**	*Do you enjoy working together with others?*	**MC-DD4**	1) yes 2) not so much 3) Only with competent team members. 4) No, not at all.
13 **DP**	*Do you see yourself as a decider?*	**MC-DD3**	1) yes 2) no 3) Sometimes, yes.

14 OD	*What kinds of decisions do you have to make in your job?*	**FF-L**	–
15 OD	*What depends on your decisions?*	**FF-L**, **SR**	*e.g. the life and health of others, a competitive advantage, financial/technological success, the reputation of the organization, wellbeing of others etc.*
16 DP	*What motivates you and influences your judgment?*	**FF-L**, **SR**	*e.g. visible results, bonuses, promotion, benchmarking, internal/external control etc.*
17 OD	*Do you prepare decisions for others? Do you support others - like your superior - in decision-making with your contribution?*	**MC-DD2**	1) yes 2) no
18 OE	*If yes, how do you prepare a decision? Are there guidelines?*	**FF-L**	–
19 DE	*Are you familiar with methods for decision-making?*	**MC-C2**	1) yes 2) no
20 DE	*Was decision-making part of your education?*	**MC-C2**	1) yes 2) no
21 DE	*Which methods for professional deciding/decision preparation do you know? What is your preferred method?*	**FF-L**, **SR**	*e.g. internal guidelines, FOR-DEC, medical anamnesis, check-lists, manuals, OODA-loop, PDCA-cycle, Eisenhower Matrix, DMAIC-cycle etc.*
22 DP	*Do you use decision aids in your personal life? Do you sometimes write a pro and cons list or flip a coin when you have to decide something?*	**MC-C4**	1) yes 2) never 3) sometimes 4) I follow the advice of others.
23 DP	*What helps you best when making choices?*	**FF-L**	–
24 PD	*Do you trust your gut feeling? Can you rely on your intuition?*	**FF-L**	–
25 DP	*Are your decisions rational?*	**MC-C4**	1) Yes, of course. 2) Often. 3) Sometimes not. 4) I don't know.
26 D	*Are rational decisions better?*	**MC-C3**	1) yes 2) no 3) maybe

27 **D**	*Do you sometimes change your mind after having made a choice? Would you change your decision?*	**MC-DD7**	1) Yes, sometimes I do. 2) No, I stick to my well-prepared decision. 3) Yes, if the circumstances change, I do. 4) Only, if I was obviously wrong. 5) Yes, it's a sign of flexibility. 6) No, because this is not professional. 7) No, I'd rather don't. It's too much effort.
28 **D**	*Is personal intuition important for making professional decisions?*	**MC-DD4**	1) Yes. 2) Sometimes intuition is helpful. 3) This is not professional. 4) No.
29 **D**	*What is a good decision?*	**FF-L**	–
30 **D**	*And what do you think is a bad one?*	**FF-L**	–
31 **DP**	*What was your best professional decision? And why is this so?*	**FF-L**	–
32 **OD**	*Making mistakes is human. How is failure handled in your organization? Do colleagues tend to hide errors and fear consequences or is there rather an open error-culture?*	**FF-L**	–
33 **D**	*What influences or even impairs good decision-making? Do you experience constraints? What bothers you most?*	**FF-L**, **SR**	*e.g. time-pressure, cost-pressure, legal restrictions, lack of information, stress, disturbances at your workplace, competition with others, hierarchies, fear, personal attitudes etc.*
34 **D**	*What supports good judgment?*	**FF-L**	–
35 **DP**	*What would be your good advice for a friend for a personal decision?*	**FF-L**	–
36 **DP**	*What is your advice for making good professional decisions? What is your golden rule?*	**FF-L**	–

Preliminary remarks: The questionnaire comprised **36 questions** of different thematic depth. Since the participation of respondents depends on their continuous motivation to complete the survey, a too rigid design of the questionnaire was consciously avoided. That is why, answering all questions in general, in a particular order or in a certain period of time (e.g. multiple sessions) was not obligatory. The omission of questions was even permissible. Insofar, the motivation to provide information was of higher importance than insisting on strict adherence to the questionnaire's structure. In this sense, the layout had – as far as suitable – a certain variety regarding the different answering modes (multiple choice) and included questions that convey quick progress. The survey platform provided several **answering modes** to the questions. For the questionnaire four answering types were applied. The option of free-form answers suited open questions best. Depending on the complexity of the question, a short or long variant was selected **(FF-L/FF-S)**. Preformulated multiple choice answers – with checkboxes or drop-down options – were applied for polar questions or for topics that did not require extensive answers **(MC-Cn/MC-DDn)**. The advantages of multiple-choice answers are their comparable results due to the limited amount of options and the time-saving, convenient way to answer. The intention not to exhaust the respondents was an important purpose for the chosen proceeding.

In addition, some questions were clarified with **explanatory remarks (SR)** for two reasons. Firstly, potential queries from respondents should be prevented in advance in order to maintain the neutrality of the author and to avoid any influence. Secondly, the remarks were intended to support (*to nudge*) the flow of answers. Insofar, these – for all respondents equally available – brief comments were considered to be a supportive measure not only for the informants, but also for the effective conduction of the survey, which would not have benefited from incomplete answers.

Further, some questions were intentionally posed repeatedly in an indirect, paraphrased manner or in a different context for testing the consistency among the respondent's answers. In general, the sequence of the questions was oriented on the conclusive thematic progression, beginning from the respondent's background, followed by professional experience and finally leading to a more holistic view on decision-making. Being aware of the limitations of an online questionnaire, the thematic categories were selected to capture the complexity of the topic under investigation.

Decision-making represents a process that is influenced by a multitude of factors. Insofar, the posed questions were utilized to obtain primary data from the respondents in order to gain an impression of the challenges in practical deciding, to detect interdependencies, to understanding the implications of the influencing factors and consequently the dynamics of professional deciding better.

Table 31. Questions and related categories

Topic	**Main category** and sub-categories	**Questions**
Decision	**D**, DP, DE	18
Organization	**O**, OT, OE, OD	8
Personal criteria	**P**, PT, PD	5
Education	**E**	3
Team	**T**	2
	Total number of questions:	**36**

The survey opened with questions regarding the **Personal criteria (P**, PT, PD**)** of the respondent, which comprised age, place of residence and the cultural roots.[246] Table 31 illustrates the comparably small quantity of questions belonging to this category, but the content is of high significance in two regards. On one hand, the answers conveyed a biographic impression of the person and created an individual context for the obtained data in general. On the other hand, the questions served as a simple entry into the survey and paved the way for sharing information about the following topics.[247] At the same time, the amount of requested personal information was reduced consciously to only indispensable data for the study. Of course, the requirements of anonymity also led to a less extensive collection of (socio-)demographic information. As mentioned before, the significance of cultural effects on decision-making was of interest. Therefore, the informants were asked to share information about their cultural background and the place of residence. The presumption of a possible influence of international experience, different roots and cultural diversity on decision-making was the cause for the questions. The first subcategory PT focused on the personal attitude towards teamwork. PD as the second subcategory was centered around the self-assessment regarding personal intuition and gut feeling. In fact, the questions regarding the respondent's level of **Education (E)** also belong to the broad context of personal criteria. The applied subcategories highlight the relevance of education for other main categories. Insofar, this category summarizes the educational and professional background in order to understand

[246] There is a common recommendation, to preferably capture personal data at the end of a survey. I chose to put these at the beginning of the questionnaire as a few easy to answer "icebreaker-questions". In doing so, I followed partially the advice from Mayer (2009) and applied gained experience from formerly conducted studies. Mayer (2009) underlines, for example, that an opening question is intended to "break the ice", to build trust and foster motivation in order to answer the questions. („[…] ein Vertrauensklima zu erzeugen und die Antwortbereitschaft auf die eigentlichen Befragungsthemen zu erhöhen.") Simultaneously, Mayer (2009) argues that socio-demographic data shall rather be obtained at the end of a survey. (Mayer 2009, p. 95)

[247] Marginal note: An interesting view of Tamir et al. (2012), who examined the human pleasure of sharing personal experience and explain: "We test recent theories that individuals place high subjective value on opportunities to communicate their thoughts and feelings to others and that doing so engages neural and cognitive mechanisms associated with reward." (Tamir et al., 2012)

the individual development and the current position in the organization better. The requested information about formal qualifications and professional experience is directly comparable among the respondents. The influence of experience and education on decision-making was of particular interest. The assumption of improved skills and growing experience due to repetitive confrontation with decision-making during a career was also part of the concept of this category. The questions about the profession and occupation led to the subsequent categories, that were dedicated to finding out more about the working sphere of the informant. This refers to the contextually related categories of **Organization (O,** OT, OE, OD**)** and **Team (T)**. Again, detailed information about the employer could not be collected due to reasons of confidentiality. Nevertheless, branch, profession, current position and education level allow in combination an even though rough, but sufficient basis for interpretation.

The category **T** collected information about the team like its structure and composition. The subcategories were intended to find out, how the respondent perceives and describes the organization. Subcategory OT contained questions regarding the integration and the position in a team. Subcategory OE aimed to find out more about internal support or education regarding decision-making. Subcategory OD comprised questions about the professional decisions the respondent has to make. Often, organizational decision processes require preparation for others. This means, that the actual decider is different from the person, who took care of the preparation. (This fact leaves room for influence on the decider during the preparation.) Both topics of the organization's error culture and the management of failure were also of particular interest.

Finally, the main category **Decision (D**, DP, DE**)** was centered primarily around a more general view on making decisions. Therefore, the questions addressed aspects like the opinions regarding subjectively perceived decision quality, rationality, the role of intuition and influencing factors like stressors and constraints. The subcategories refined the picture and conveyed specific perspectives on decision-making. Therefore, subcategory DE was focused on the familiarity with decision methods and whether this topic was part of the respondent's education. Aspects like the respondent's personal perception as a decider, ways of decision-making in private life, driving motives, personal advice for others and gained experience were the central points of interest of subcategory DP.

6.4 Validity and limitations

The study consequently followed a methodical approach in all of its phases. The preference for a qualitative research design determined how data was obtained, managed and examined. The advantage of the chosen proceeding was the comprehensive primary data, that represented authentic first-hand-information from the participants. The online questionnaire was the only applied means in order to gather the respondents' direct and subjective answers. The rather holistic perspective was considered to be adequate for the complex social phenomenon of decision-making. The dataset of the study comprised all received answers of the probands as raw data. The data was already collected

in a way, that no modification like transcription or anonymization was necessary. Insofar, the dataset was not edited and the corpus remained intact. The aspect of consistency was of high priority: this refers to the strict adherence to the online questionnaire format in English. Flexibility was more or less permissible for the respondents due to the option of skipping questions. Insofar, incomplete sets of individual answers were possible. In order to prevent missing answers, a few questions were explained with brief remarks, but these comments were available for all participants. The respondents did not receive any additional explanation or advice from the author of the study.

Thanks to the reliability of the survey-platform in relation to data collection, management and seamless export, validity threats due to data loss or manipulation were prevented. The technical functionality and the convenience for the user were also checked and evaluated carefully in a pretest. Additionally, adverse effects due to multiple participations were not to be expected, because incentives were not offered and the survey was with 36 questions too extensive for repeated participation. Already by design of the questionnaire, the primary data was structured in two ways. Firstly, the received answers were clearly associated with the respective questions of the survey. Secondly, the predefined thematic categories and subcategories systemized the material. This proceeding supported the neutrality and distance of the author. Under these preconditions, the integrity and validity of the dataset were not expected to be compromised.

Since the study had a specific topic, followed a qualitative orientation, allowed only a single uniform mode for participation and consisted only of a comparably small sample size, the possible results were expected to have inherent **limitations**. That is why, it was beforehand clear, that a derivation of valid generalizations outside the study's scope is not realistic. On the contrary, the advantage of the approach was and is seen in the individuality of the authentic replies. These answers and possible patterns among the respondents' answers were of particular interest. Clarity from the start about the advantages, limitations and the scope of a qualitative study, shaped the expectations reasonably.

6.5 Chapter summary – Methodology

The present section presented the applied qualitative approach of the online survey about professional decision-making in more detail. Therefore, this part dealt with aspects like conception, survey planning, data collection and the validity of the expected results. Predominant points of interest of the survey were the estimation of decision quality, personal experience, knowledge and attitude towards deciding. This comprised related aspects like inter alia the specific professional setting, self-perception in decision processes, the awareness of influencing factors and the familiarity with methods for deciding. The survey-questions were intended to address these topics from different angles. The included survey-guide comprised the posed questions, their thematic categorization and explanatory comments.

7 Survey – "Good decision-making"

The presentation of the survey is guided by the considerations made in the preceding section of Methodology. In general, the answers from the respondents are analyzed in accordance with the five defined categories of *personal criteria, education, team, organization, decision* and the respective sub-categories. These categories determine the structure of the following sections which focus on the results and their analysis. Therefore, the received answers of the respondents are firstly presented in a systematic manner, before they are analyzed in a second step. The analytical part is followed by the conclusions drawn from the preceding evaluation.

7.1 Overview of the received answers

The present section represents an overview of the answers the respondents, who took part in the online-survey "Good decision-making", provided. The **complete set of answers** is included in **Appendix B** of this work.[248] The answers from the participants reflect their entirely subjective assessments. Insofar, the answers are treated in a qualitative manner. The aim hereby is more to understand the reasoning of the probands in the light of the preceding theoretical considerations than to derive measurable generalizations or to express relations in numerical terms.

The study had a duration of five months whereby answers accumulated over time. Here, the replies are systemized according to the thematic focus of the respective questions. The thematic embedding is justified due to the particular explanatory value of the context. Nevertheless, an isolated consideration remains possible as well. The internal contextualization of the data-set reflects the discussed aspects of the theoretical part of this work. These connections are also explicitly part of the following sections. In total, **42 participants** contributed to the study with their answers. As mentioned before, the study was consciously conducted in English in order to receive answers from an international group of respondents, though one participant preferred to answer in German. The answers from this person are generally included in the number of respondents in order to leave the corpus intact. Due to reasons of consistency, the written answers in German are consciously not translated and consequently excluded from further consideration.[249] These cases are indicated in the sections below by assigning *(-1)* next to the original value. Therefore, the by *1* reduced number represents the amount of valid responses. Answers from this participant that belong to questions with predefined answering-options (e.g. multiple choice) or numerical answers, are included, since these do not compromise consistency due to the chosen language. Therefore, these answers are considered to be equivalent to the ones from the other respondents.

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[248] The **questionnaire** of the study is included in **Appendix A** and is also online available under the following link: https://forms.gle/BfvGpDKebKiLbjry9. **Appendix C** contains the card with the QR-code which served as a direct way to participate in the study (e.g. from a mobile device).
[249] See also the brief rationale regarding desired consistency in section *"6.2. Data collection and data management"* of this work.

The subsequent sections provide a summary of the gathered replies in order to systemize and organize the raw material corresponding to the related thematic sections. Essential key-points that are part of the responses are highlighted. Of course, the number of received answers is indicated as well. As mentioned before, the replies were not edited and did not require anonymization or any deletion of personal data. The corpus was also not compromised due to data loss or damage.

Table 32. comprises the number of received answers for the individual questions. The overview shows that some of the participants chose not to answer all questions. Some answered the question by filling out the field with an explicit remark indicating *no answer*. The design of the survey was flexible enough to allow skipping questions. This proceeding was consciously chosen in order not to risk the discontinuation of the participation. Due to the length of the questionnaire and the lack of provided incentives, multiple participation of respondents can be excluded.

Table 32. Numbers of received answers

Q	A	Q	A	Q	A
Total number of participants: 42 *Note: received answers in German (-1), final number bold*					
1	**42**	**13**	**42**	**25**	**42**
2	42 (-1) **41**	**14**	42 (-1) **41**	**26**	**42**
3	38 (-1) **37**	**15**	42 (-1) **41**	**27**	**41**
4	42 (-1) **41**	**16**	41 (-1) **40**	**28**	**41**
5	42 (-1) **41**	**17**	**42**	**29**	42 (-1) **41**
6	**41**	**18**	33 (-1) **32**	**30**	42 (-1) **41**
7	42 (-1) **41**	**19**	**42**	**31**	40 (-1) **39**
8	**42**	**20**	**42**	**32**	40 (-1) **39**
9	**41**	**21**	40 (-1) **39**	**33**	41 (-1) **40**
10	42 (-1) **41**	**22**	**42**	**34**	42 (-1) **41**
11	42 (-1) **41**	**23**	39 (-1) **38**	**35**	39 (-1) **38**
12	**42**	**24**	42 (-1) **41**	**36**	38 (-1) **37**

In general, the values illustrate that the **readiness to participate** and to answer (also the more comprehensive) questions maintained a good level. In particular, the questions that allowed quick answers due to the answering options like multiple choice, show a very good rate of participation. These answering modes facilitate a quantitative evaluation of the responses. The integration of such rather convenient elements to answer was also intended to keep the respondents motivated. A fluent proceeding in the questionnaire was of high importance.

Received answers – Category: Personal criteria

Category P – questions: 1 (42), 2 (41), 3 (37)

Sub-categories PT, PD – questions: 12 (PT, 42), 24 (PD, 41)

Key-aspects from the responses: wide spectrum of age, diverse cultural backgrounds, positive attitudes towards intuition and gut feeling

The first question of the questionnaire was intended to obtain information regarding the age of the probands. This information represents one parameter for the contextualization of other data. With regard to the topic of professional experience, intuition and generally accumulated life experience – also concerning decision-making – the aspect of age is of relevance. The posed questions no. 2 and no. 3 referred to personal criteria regarding the personal cultural background and to both the country of residence and of origin. The answers to these questions serve as rough impression of the respondents' probable cultural context. Question no. 2 is also intended to indicate whether a person is experienced in living/working in different cultural contexts. Question no. 12 focused on the personal attitude towards working in a team. This aspect is consciously subsumed to this category, since the general affinity to collaborate in a group – in contrast to the preference of working independently – is assumed to be a personal matter. This applies as well to question no. 24 which is intended to gather information about the personal opinion about the reliance on intuition and gut feeling.

The first question of the questionnaire was about the age of the respondent. The spectrum reaches from 21 years of the youngest proband up to 73 years of the oldest participant. The following list summarizes the diversity regarding age.

- *Respondents **under the age of 30** years:* ***4***
- *Respondents **between 30 and 40** years:* ***15***
- *Respondents **between 41 and 50** years:* ***15***
- *Respondents **between 51 and 60** years:* ***2***
- *Respondents **over 61** years:* ***6***

The answers represent a wide range of age. The scope comprises on the one end four persons who stand at the beginning or are in the early years of their professional path. Thirty respondents represent a large group, ranging from thirty to fifty years, in the middle. On the other end, there are eight persons aged above 51 who participated as well. The latter group comprises also persons that are already retired and therefore answered the questionnaire with a retrospective, very experienced view. For the context of decision-making, the age is of relevance, since it stands in correlation to experience in life and at work.

The second question aimed to obtain information regarding the personal roots of the respondents. The answers can be classified according to the basic criteria of *"one country"* or *"more countries"* in the personal biography. The intention behind the question is to find out whether respondents had the opportunity to experience other countries for a longer period of time. Working in another country is often related to experiencing also a different context of collaboration.[250]

The present study stands because of the author in relation to Germany (GER), therefore a considerable amount of answers was submitted from German participants[251] or probands who answered with a relation to GER. One participant comes from Azerbaijan and lives now in Latvia.

- *Born/raised and currently living in the same country: 1 (Ghana), 28 (GER)*
- *Born/raised and currently living in another country:*
  1 (Azerbaijan/Latvia), 1 (Italy/GER), 1 (GER/Italy), 1 (Guatemala/GER),
  1 (Poland/GER), 1 (GER/UK), 1 (Turkey/GER), 2 (Israel/GER),
  2 (Russia/GER), 2 (India/GER)

The results indicate for 29 respondents working experience that is not connected to living in another country. 13 respondents moved to another country in order to live and to work there. The answers show partially considerable distances between both places. In all of those cases, the confrontation with a different language is associated with the relocation. The question about the respondents' cultural background belongs to the present context as well. Here, the answers diverge according to the following points of reference.

- *Country/nationality: e.g. Italian, Danish, German-Caribbean, Israeli*
- *Continent/region: Europe, Eastern-/Western-European, Africa, India*

[250] This does not mean that respondents might not have gained experience abroad at all. Here, this criterion serves as a means to receive information about the general experience of living/staying rather permanently in a country that is different from the one of origin.
[251] German participants often mentioned different cities or federal states of GER. This information is in the present context not of relevance.

- *Religion:* *Roman-Catholic, Christianity*
- *Values:* *kindness, respect, hard work, peacefulness*
- *Other factors:* *humanity, White-Caucasian, art customs, language*

The description of the own cultural background was oriented on geographical, religious or other parameters like certain values. The predominant criterion was the geographical reference. Here, the countries or the continents were named. The Christian socialization of some probands occurred as characteristic as well.

Question no. 12 deals with the personal attitude towards collaboration with other people. This question was intended to find out what the person's general disposition is concerning teamwork. The results illustrate two distant poles. The majority of respondents likes to work in a team, whereby some specify the quality of collaboration. Only one person admitted not to enjoy teamwork at all.

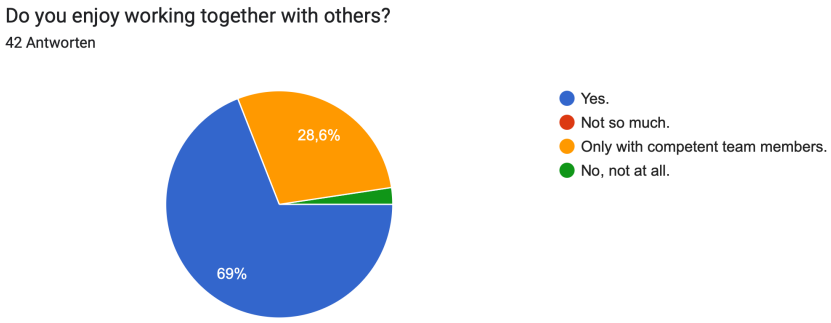


Figure 2. Responses to question no. 12

The answers to question no. 24 about the self-assessment concerning the reliance on gut feeling and personal intuition belong to the sub-category of personal attitudes in the context of decision-making. The questions intended to find out how the respondent evaluates these phenomena. Generally, many respondents confirmed the value of intuition and gut feeling for making decisions, both in personal and professional contexts. The major part of probands answered in a positive way – some explicitly "yes" – but some also positively and with gradual differences like "sometimes", "mostly" or "often". One person replied clearly "no" to both questions. A few respondents provided explanatory remarks to their answer. These remarks mention the perceived limited reliability or the appropriate contexts of application. The differentiation between the professional fields of aviation and the military sphere, are of particular interest due to the

discussion in the theoretical section. The following examples of commented responses are taken from the set of answers to question no. 24.[252]

> *"Gut feeling is good. Basically this reflects your professional experience. It has to be challenged by a peer group and developed with analytical methods."*

> *"In cases when there isn't enough data to make an informed decision, I do rely on gut feeling. However decisions based on gut feeling are taken with extra care and further 'monitoring'."*

> *"Yes, in the military environment. NO, in the aviation context."*

> *"yes, based on experience, but being aware that feelings sometimes can be wrong, so stick to the rules and violating them should be a proper action after analyzing the sitution and rational decision. That are the basic rules of an Pilot in every situation: 1. Maintain aircraft control 2. Analyse the situation 3. Take proper action"*[253]

Received answers – Category: Education

Category E – questions: 4 (41), 5 (41), 6 (41)

Key-aspects from the responses: diversity of professions and qualifications, wide spectrum of years of professional experience

The category comprises questions focusing on the education of the respondents. Therefore, the level of education expressed in terms of formal degrees, the current profession, and the years of professional experience were of interest. Question no. 4 was hereby intended to obtain information regarding the highest level of education like the highest academic degree. This proceeding aims to convey through the answers an impression of the formal preconditions for professional success, and also for the potential aptitude as a decider. Data about the proband's profession are collected in order to assess the professional position of the person, also in relation to the level of education. The question regarding the years of professional experience relates to the common assumption of the accumulation of (professional) intuition in correlation with the duration of professional activity.[254] Insofar, the questions intended to gain a rough impression of the

[252] See also Appendix B.
[253] The answers are not edited.
[254] Question no. 1 of the questionnaire referred to the age of the respondent. This represents a second indicator for growing experience over time.

probands current position and the development in professional life. This is, as mentioned above, done with focus on (building) intuition and the level of decision-making skills.

The qualifications of the respondents comprise various levels. This includes the professional baccalaureate, Bachelor's and Master's degrees, Diplomas and Doctoral degrees. Four respondents have two degrees (Master and Diploma or two Master degrees). The attained formal qualifications represent the general admission requirements to the professional activity. The spectrum of years of gained professional experience is similarly wide. It ranges from young professionals with one year of experience to persons with up to 41 years of professional activity.

- *1-5 years of professional experience: 8*
- *6-10 years of professional experience: 4*
- *11-20 years of professional experience: 15*
- *21-30 years of professional experience: 9*
- *31 and more years of professional experience (41 years max.): 4*

Insofar, the levels of education and professional paths from the younger respondents may still change over time due to further qualification or changes in directions. The variety of professions in the answers to question no. 5 comprises the following occupations subsumed to main branches:

- *Health-care: dentist (3), medical Doctor/including ICU (2), employee (1), senior physician (2), physiotherapist (1)*
- *Aviation: Air Traffic Control (1), Aircraft Maintenance Engineer, student (1)*
- *Military: General staff officer, private flight instructor for commercial pilots (1), General staff officer, pilot (1), Soldier, staff officer, intelligence (1)*
- *Education: teacher (3), psychologist for schools (1)*
- *Lawyer: retired lawyer, mediator (1), lawyer, managing director (1)*
- *Administration: head of office (1), government official, lawyer (1), ministry official (1)*
- *Politics: political advisor (2), lobbyist and medical doctor (1)*
- *Management: CEO (1), diverse management positions (11)*
- *Others: police officer (1), software engineer (1)*

The list of summarized answers shows that many respondents have more than one professional focus. Partially, the initial profession differs considerably from the actual professional activity (e.g. medical doctor and lobbyist). The list highlights as well the different positions for lawyers. More consistent appear the professional paths of teachers and (besides the mentioned example) health-care professionals. One respondent has an occupation and studies additionally.

Received answers – Category: Organization

Category O – questions: 7 (41)

Sub-categories OT, OE, OD – questions: 8 (OT, 42), 11 (OT, 41), 18 (OE, 32), 14 (OD, 41), 15 (OD, 41), 17 (OD, 42), 32 (OD, 39)

Key-aspects from the responses: hierarchical organization, organizational deciding, decisions and their consequences, management of failure

The central topic of the third category is the professional setting the respondents belong to, seen from different angles. Firstly, the branch in general was of interest, since specific methods, tools, principles and tasks for decision-making could be of relevance.[255] Secondly, questions were posed to gather information regarding the person's individual role in the organization's framework and the position in the team.

Further questions focused on decision-making in the specific context of an organization. Therefore, the aspects of professional education (e.g. the availability of trainings) and guidance (internal rules, specific standards or manuals) were of particular interest. This comprises also the availability of support, advice and generally training in decision-making. The theoretical section highlighted the importance of (methodical) knowledge and training in the field of decision-making in order to build experience and to prepare (or to improve the skills of) deciders for this responsible task. In doing so, this professional aspect would, similar to other acquired skills, rest on a sound foundation too.

The participants were also asked to report what kinds of decisions they are confronted with. Of particular interest was to find out what may depend on the choice. This information is connected to the topic of human fallibility and the organization's error culture. As mentioned before, the way an organization treats failure may have significant impact on how decisions are finally made. Another important aspect was the question concerning the preparation of decisions for others and whether guidelines of the organization exist. Due to the division of labor in many organizational contexts, the preparation of decisions can be split among specialized colleagues. Often, decisions are

[255] This context was beforehand also of interest when the respondents were asked to provide information regarding their occupation.

prepared for the person who finally decides on the subject. Then, the process of preparation may, as discussed in the theoretical section, be vulnerable and not be free from (undesired) influences like framing, biases and (personal) motives of others.

Generally, the major part of respondents confirmed with their answers to question no. 8 the belonging to a team. Hereby, some answers differentiated the positive reply regarding the team integration based on specific factors. These probands are *sometimes* part of a team. Two respondents declared to work independently.

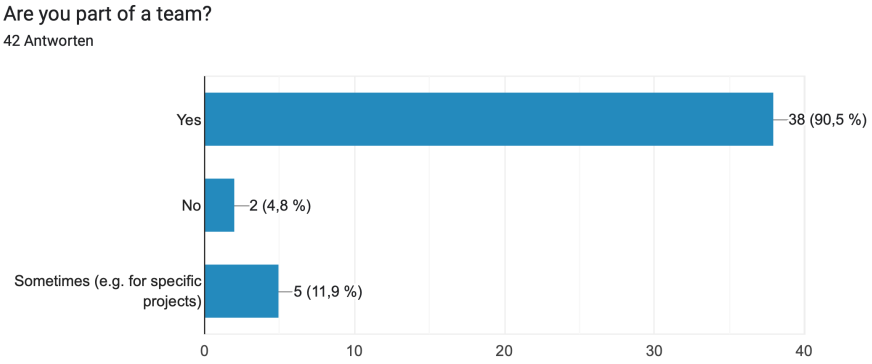


Figure 3. Responses to question no. 8

Question no. 7 requested information regarding the branch in general. Thereby, the international component of the organization's operation was of interest as well. The latter aspect aimed to detect whether the work of the respondents may be influenced by a cross-cultural component. The answers contain the following general branches. Here, the answers are categorized according to their primary national or international setting:

- *Predominantly national operation:* *medical care (dentistry etc.) military, defense industry, politics, public service, telecommunications, aviation (ATC, Ghana), education (local schools, school psychology)*
- *National and international operation:* *software, Ministry of Energy and Climate Change (GER, EU and global level), NATO, aviation (international, airline), medicine (generally internationally contextualized)*

The answers show a predominantly *single national context* of general operation for local-based health-care institutions, schools, politics and public service.[256] Other fields

[256] This does not imply cultural homogeneity of the concrete working sphere at all, since teams, the groups of customers, patients, students or business partners are not seldom culturally diverse.

are potentially more embedded in wider, international contexts: probably, for reasons of the type of products or services (air travel, software), remote cooperation and topics of global relevance (medical science, energy, climate change, politics, organizations like EU, NATO).

Question no. 11 was about the hierarchical structure of the team. In addition, the personal role of the respondent in the particular organizational setting was of interest.

- *Actual existence of a formal hierarchy: 11*
- *No or rather flat hierarchy: 13 (multiple times: equality)*
- *Existence of an informal hierarchy: 1 (due to professional experience)*

- *Personal role in the hierarchy as a (team) leader:*[257] *12*
- *Other perceptions of the personal role: determination due to personal responsibilities, coordinating role, external position as a consultant, leading and coordinating, employment, level of management (middle), worker, below the hierarchy*

The answers reflect on the one hand side clear hierarchical structures – even apart from the formal point of view – and on the other hand rather as equal perceived relations among the colleagues. The self-perception regarding leadership, is mirrored in the assumption of a hierarchical organization. The perception of the individual role of those, who are not in leading positions, is more diverse. Some describe their role according to their function (coordination, facilitation of communication) or according to their status in the organization as employee, person from the middle management or as a worker.

> *"Yes, the system is made that way. We senior physicians make the decisions and also teach and train younger colleagues"*

> *"I am the head of the human sciences departement. I oversee all the exams and curricualae, help colleagues, develop teaching lessons and coordinate the development of the school with the other departements. There is a clear hierarchy but it depends on how you use it. E.g., technically I am allowed to change the grades of the colleagues in my departement and can override nearly all decisions but rarely do so, because it would*

In the given context, the organizational and branch-specific embeddedness were of primary interest.

[257] Partially together with other leading colleagues.

create a lot of friction. All in all I am the pacemaker of my departement and the expert to ask whenever something comes up."

"Everyone is on an equal footing with us. Everyone does what they are good at. The only people who have a different attitude are the bosses. Otherwise, everyone is just as much an employee as I am."

The examples taken from the received answers give an impression of the perception of the organizational structures. The first example refers to *the system* that determines the organizational setting.

The following set of questions (no. 14, 15, 17, 18, 32) is more directly and concretely related to decision-making from an organizational perspective. Question no. 17 aimed to find out whether the respondents are involved in the process of decision preparation. Hereby, 32 probands confirmed a preparatory contribution. Ten persons negated the question. The answers are related to the follow-up question no. 18 that focuses on how the preparation is practically made.

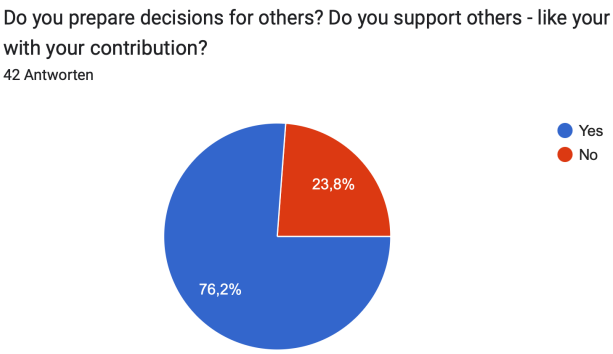


Figure 4. Responses to question no. 17

Even if some respondents declared not to contribute to the preparation in an explicit manner, comments were provided nevertheless. The following selected answers reflect the heterogenous picture, that comprises the absence of guidelines for preparations on the one hand. On the other hand, there are (internal) standards and guidelines that reflect the expectations regarding decision preparation.

"Just formal guidelines as in how a memorandum or note has to look like. Preparing decisions via writing notes, drafts and memorandums"

"one-pagers, breaking down complexity of topics for company leadership. no guidelines."

"No guidelines, but as a former Army Officer I use Bundeswehr's „Führungsprozess" that starts with „Beurteilung der Lage", the development of Course of Actions (Möglichkeiten eigenen Handelns), systemic analysis of these CoAs (pros/cons, common elements), resulting in an „Lagevortrag zur Entscheidung" (LVE) for the decision maker to make an informed decision"

"I follow the military decision making process. no guidelines"

"i assess the problems of the patients to refer them to the right specialist in the practice."

"Yes, there are normally internal regulated procedures. In terms of content-related issues, I focus on my own understandings of the things."

"By gathering all the relevant information from all stakeholders in order to inform decision makers about the status and also of possible outcomes."

Persons that are familiar with military decision-making, relate to this methodical proceeding, even if they are not actively serving in the armed forces. Other answers mention the outer structure of the preparation in the form a concise written document. This proceeding reflects the limited amount of time that deciders often have. That is why, the appropriate and precise preparation of a decision is key. One answer explains the decision preparation in terms of a first assessment of the patient's state of health in order to send the person to the right person for further treatment.

Due to their thematic proximity, questions no. 14 and 15 are considered together. The first requests information about the types of decisions the probands have to make. The second question focuses on the consequences of the decisions.

- *Medical decision-making: treatment strategies, vital decisions, coordination with other staff on the ward*
- *Aeronautical/aviation related decision-making: binary decisions, tactical decisions, ATC (safe, efficient, orderly flow of air traffic), aircraft repair*
- *Military decision-making: choice between options*

- *Educational decisions: choice of materials, valuations, support for students/pupils, evaluation, supervision of exams*
- *Legal decisions: in order to support the clients*
- *Others: organizational, administrative decisions, hiring decisions, solutions for daily problems, technological choices, campaign development, decision on trustworthiness of information, preparation of political decisions*

The professional sphere sets clearly the framework for the decisions. The responses comprise a multitude of decisions that have to be made. The following examples illustrate a part of the wide spectrum:

"financial, technological, processual / as mil pilot: operating helicopter and tactical decisions"

"Military environment: choosing between options. aviation environment: frequent binary decisions between alternatives (yes/no)."

"How do I enforce my clients' interests quickly and cost-effectively using the law?"

"preparatory decision to enable politicians to make political decisions"[258]

"Decisions ensuring safe, orderly and efficient flow of Air Traffic."

"supervise alle sorts of exams (regular and final ones) - make sure that comparability is given - identify and alleviate problems of all sorts in our teaching - specifying lines of development - differentiate between the students needs"

"Manly Overview and Planning of my Patients Treatment. Course of action regarding Education an implementing new developments on my Ward together with my Team members and the leading nursing Staff"

The answers underline that the respondents are clear about what kinds of decisions belong to their professional tasks. Also, there is clarity about the priorities in their

[258] This answer clearly illustrates the high influence of decision preparation on the actual decision.

decision-making. The following question is centered around what depends on the professional decisions of the probands.

- *Medical decision-making: life, health, healthy teeth, reputation, wellbeing, existence of the practice, project progress, education, quality*
- *Aeronautical/aviation related decision-making: binary decisions, tactical decisions, ATC (safe, efficient, orderly flow of air traffic), aircraft repair*
- *Military decision-making: information, intelligence*
- *Educational decisions: school career, success of the students,*
- *Legal decisions: multiple consequences*
- *Others: technological success, reputation, happiness, nothing, outcome of legislation*

Question no. 32 stands in close context two the previous questions and relates to the topics of human failure and the existence of an organizational error culture. The following aspects were mentioned by the respondents. Thereby, the entire spectrum of possible management of error is covered.

- *Existence of an open error culture, open communication*
- *Learning from mistakes, tolerance of honest mistakes, no blaming*
- *Support in cases of failure, briefings*
- *Just culture (CRM in aviation) and safety culture*
- *Hiding of mistakes, fear of consequences*
- *No satisfactory management of error, room for improvement*

Most of the answers reflect the existence of an open climate concerning failure. The described open error cultures entail open communication, feedback, tolerance and support in cases of honest mistakes. Colleagues are treated professionally and are not blamed or stigmatized. The concept bases on the ability to learn from mistakes and not to repeat them. In aviation, the overall safety maxim is reflected in CRM and in Just culture. In contrast, some participants reported that mistakes are hidden. This is related to the fear of negative consequences and punishment. Other participants mentioned that a satisfactory error management is still not established or can be improved in their organization. The following examples illustrate some of the respondents' opinions. Hereby, the effects of an open management of failure are obvious.

"In the past the way I experienced the failure mentality in Med school and life was horrible. Failure was not seen positive, more weakness, afraid to ask any questions! Was just not raising my hand and therefore missed chances to learn. Now I feel so comfortable because we have that open error culture and my stress level is low, I am joyful and I learn a lot"

"Every mistake and failure is usually treated a lesson. Such lessons are being analysed to understand how to do better next time. There isn't any need to hide errors. It's better to learn from them."

"Military peace time environment: insufficient and short-sighted error culture leads to organizational stalemate. Aviation context: Crew Resource Management (CRM) is a sophisticated framework to uncover mistakes and error to the favour of aviation safety."

"Crew Ressource Management and Error-Culture to increase Flight safety"

"It's not communicated and pops up again a lot later, e.g. in HR decisions. Not really ideal."

"Failure isn't handled particularly well I'd say, it's more like we're Trying to hide it when it happens rather than being open and honest about it. It doesn't affect me much though as I am external, and I just consult the business, but at the end of the day it doesn't help on building an open culture where successes and failures are equally accepted and to be learned from"

"A lawyer is always faced with mistakes he/she makes, because the opponent ist waiting for this situation in order to file a new lawsuit over ist against the lawyer. You have to be very attentive!"

"Mostly people don't try to hide errors because the results may be almost instantly visible. However, the concept of Just Culture is gradually being embraced in the organisation."

"Varies from one person to another. Many hide mistakes and many take responsibility."

The provided examples illustrate also the relevance of the safety culture in aviation, which includes the prevention of failure due to learning from past mistakes. Hiding of error would have dangerous consequences.

Received answers – Category: Team

Category T – questions: 9 (41), 10 (41)

Key-aspects from the responses: team diversity (professional, cultural), size

In this fourth category, focus was put on obtaining general information about the working environment, and thereby specifically on the respondent's individual integration in a team. As seen, question 12 from the first section was more oriented on the personal attitude towards team work. Here, rather the size, structure and the composition of the team were of interest. This comprises aspects like the existence of hierarchies and the diversity of the group. The latter criterion relates to the assumption, that mixed teams are beneficial for decision-making. This is particularly associated with the existence of different levels of professional experience that facilitates learning from more experienced colleagues. Additionally, mixed teams can help to reduce the effects of biased thinking, but only if constructive discourse exists. This point relates also to the actual (flat/structured) hierarchy which can have considerable influence on the openness of collegial exchange.

The discussed aspect of cross-cultural influences in the working sphere (like for example, the theme of power-distance) is also part of the aspect of team-diversity. As seen, this plurality can affect the collaboration, apart from individual personalities, in a significant manner. Of course, the advantages of team work unfold only in intact teams where the members cooperate professionally with each other.

The aspect of team diversity was predominantly answered in a differentiated manner. Diversity was assessed according to the criteria of age, gender, qualification (academic backgrounds), general perception working experience, rank, nationality and cultural background (e.g. different languages). Some answers did not specify the individual characteristics, but confirmed the diversity of the team in general. One respondent replied explicitly with negation, one preferred not to answer. The aspect of professional diversity was mentioned multiple times. Differences regarding qualifications, accumulated experience, the academic background and professions were named. Also, the variety of languages, cultures and nationalities among the colleagues was mentioned repeatedly.

The size of the team differs considerably among the respondents. Partially, this depends on the perception of the team size, because teams may come together only for specific topics. Additionally, the perception of a core or a larger team seems to be the discriminating factor. Two probands reported to work independently, all others were integrated in teams of different sizes. On the one hand, there are relatively small teams consisting of up to 10 members. On the other hand, larger teams with up to 70 colleagues exist as well. In the middle, there are teams with a number of members ranging from 11 to 25 colleagues. Obviously, many teams are not static in their composition regarding the number of colleagues.

- *Small teams with 2-10 members (21)*
- *Medium size teams with 11-25 members (12)*
- *Large teams with 26-70 members (6)*
- *No team integration (2) due to independent work (one expression of regret)*
- *no answer (1)*

In sum, the answers show an integration of the respondents in their organizational structure which is characterized by cooperation in diverse teams. Thereby, the sizes may differ and are partially dependent on the topic. Team diversity reflects predominantly heterogeneity of ages, gender, professional criteria and cultural aspects.

Received answers – Category: Decision

Category D – questions: 26 (42), 27 (41), 28 (41), 29 (41), 30 (41), 33 (40), 34 (41)
Sub-categories DP, DE – questions: 13 (DP, 42), 16 (DP, 40), 22 (DP, 42), 23 (DP, 38), 25 (DP, 42), 31 (DP, 39), 35 (DP, 38), 36 (DP, 37), 19 (DE, 42), 20 (DE, 42), 21 (DE, 39)
Key-aspects from the responses: rationality, decision quality, good advice

The questions of the fifth category directly addressed the overall topic of decision-making. Of particular interest were general attitudes of the respondents towards deciding. This included also the topic of rationality. As outlined in the theoretical part, rationality is a matter of controversial discussion. Insofar, the self-perception regarding rationality was of interest. From a slightly different perspective, here, the aspect of education was considered as well. The general familiarity with (concrete) methods for decision-making and personal preferences were part of the questions.

Some questions followed an implicit proceeding in this section: Repeatedly, questions regarding making choices in private life were posed. It is assumed, that personal attitudes and decision-experiences might spill-over to the professional sphere. Similarly, the question regarding a good advice for a friend aimed to convey an impression of fundamental attitudes of what is *good* in making choices. This follows the presumption that giving advice to a close person is driven by entirely benevolent motives.

The role of intuition, driving motives and hindering factors were part of the questions as well. The theoretical discussion emphasized the remarkable impact of stressors and constraints on the quality of decisions. Therefore, the respondents' reflection of their practical experience was of interest. The attitude towards the rather diffuse parameter

of intuition was part of the questionnaire as well. Of course, the cardinal question of a *good* decision was also part of this section. Here, the question appeared actually in two forms: one asked directly about the perception of decision quality, the other aimed to mirror it in terms of a bad decision. The request to recall a particular good decision was intended to gain a more vivid, practically and experience based impression of the perception of sound decision-quality.

Questions no. 25 and 26 relate to the topic of rationality. Answering the first question requires self-assessment of the respondents. The second question refers to the personal attitude towards rationality.

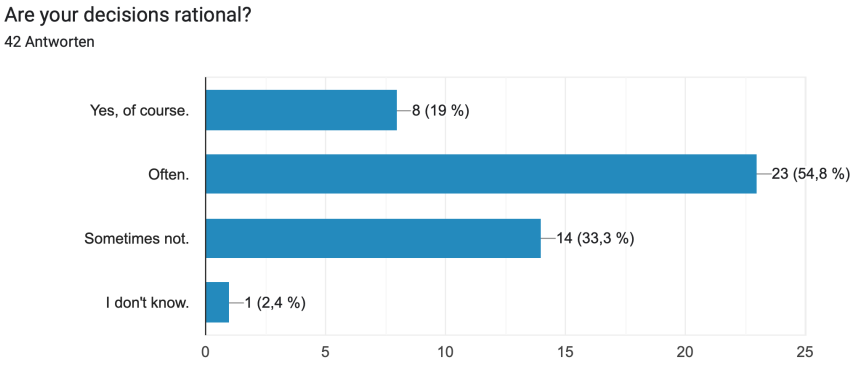


Figure 5. Responses to question no. 25

The answers to the first of both questions shows that the major part of the respondents assesses own decisions as rational. Some admit not always making rational choices, and one person cannot estimate the degree of rationality.

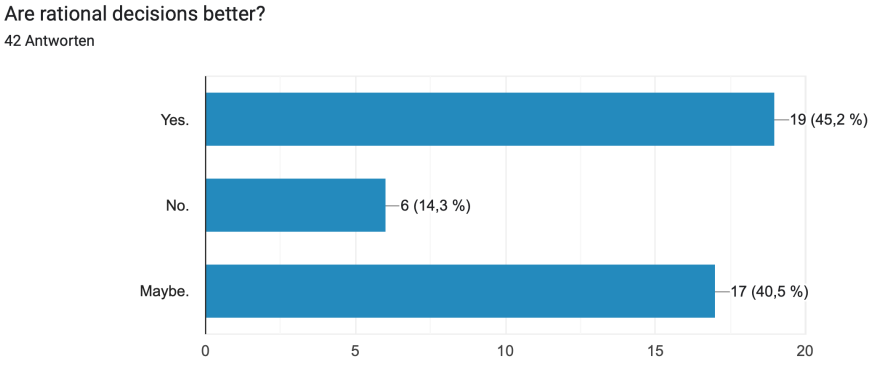


Figure 6. Responses to question no. 26

The second question is answered heterogeneously. 19 participants consider rational decisions to be of better quality. 17 respondents are unsure, and six persons respond negatively. Both questions aimed to approach the topic of decision quality with regard to rationality.

Another point of self-reflection, is the topic of being a decider. Question no. 13 intended to identify – similar to the question regarding leadership – the perception of the personal role.

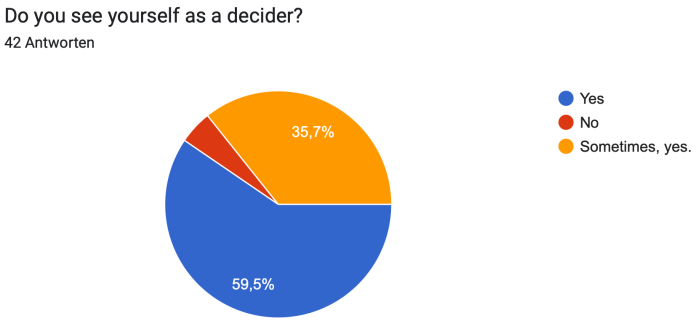


Figure 7. Responses to question no. 13

Most of the respondents (25) answered positively, 15 persons also positively with the nuance of *sometimes*, and two persons negated the question.

The questions no. 19, 20 and 21 are considered together, since they address the topic of education in decision-making. The first question refers to the general familiarity with methods for decision-making. Precisely, 21 respondents answered with *yes* and 21 with *no*. The following question aimed to find out whether decision-making was part of the respondents' education.

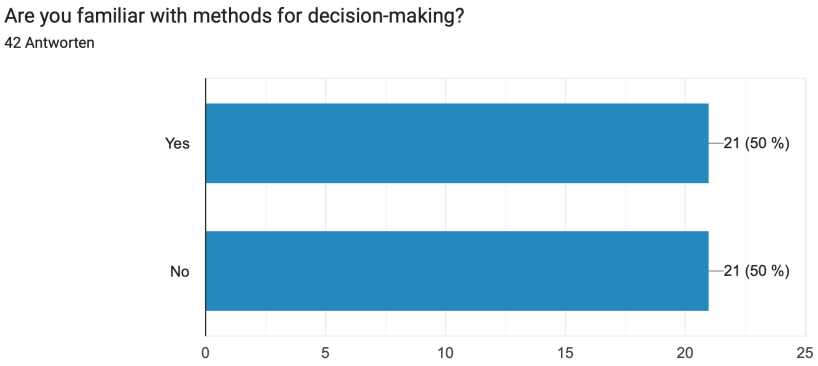


Figure 8. Responses to question no. 19

The answers reveal that a considerable part of the respondents did not receive targeted education – and thereby was not prepared – for making professional choices. The other part answered in a positive manner to this question.

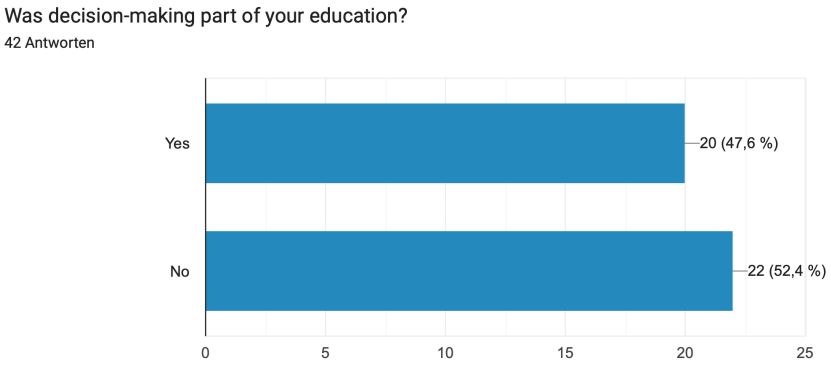


Figure 9. Responses to question no. 20

Question no. 20 focused on the familiarity with concrete methods for professional decision-making. Personal preferences for particular methods were of interest as well. Multiple times, the respondents mentioned the application of checklists, manuals, internal guidelines, the Eisenhower-Matrix for setting priorities, and medical and military decision-making processes. Some respondents did not provide concrete methods. The following examples illustrate the preference of particular methods.

"Check lists. They are simple and practical."

"Internal guidelines (command and control/decision process), check lists, aircraft manuals, Eisenhower Matrix, "R-I-A-O" (Recognize-Improvise-Adapt-Overcome)"

"DMP (mil) / ODP (Operational Planning Guide), Eisenhower Matrix, OODA-loop, Basis as Pilot: check-lists, manuals and internal guidelines (StandingOperating Procedures - SOP)"

"medical and military decision-making processes as named above (25 years experience)"

"Führungsprozess, MDMP (US process), Effects Based Approach to Operations (EBAO, Airpower Centric), Operational Planning Process (OPP, military planning on NATO level, close to MDMP)"

"The guidelines were set by the law itself, plus my own internal check -lists for the employees. As a certified mediator, I have had to use a lot of psychological knowledge."

"in particular directives, guidelines and treatment regulations"

The selection of examples reflects again the specifics of the field of application. Checklist application is here relevant in the spheres of medicine, aviation and military.

Questions no. 22 and 23 change the perspective from professional deciding to the private sphere. Both questions are evaluated together. Firstly, the personal relation to decision-aids is of interest. Secondly, the question regarding personal habits and experience is posed.

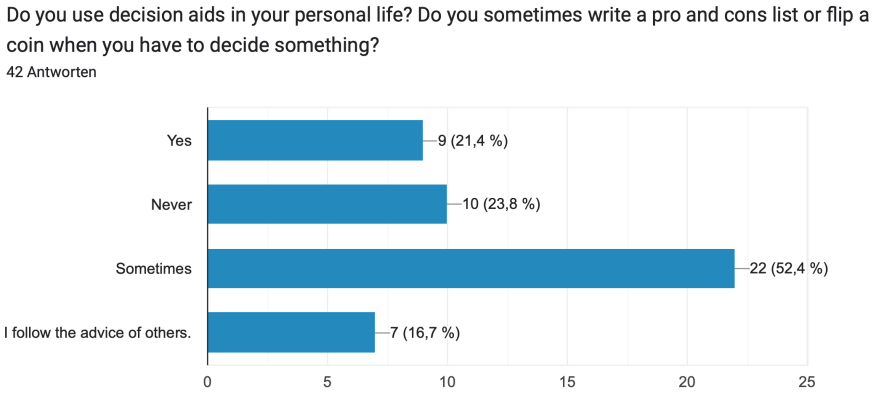


Figure 10. Responses to question no. 22

The composition of answers is heterogenous in this context. The major part of respondents showed an affinity for decision aids in private life. The recommendations are for example: taking time to think, talking and hearing the advice from others (friends and family), reliance on intuition and reasoning, gathering of information, using experience, controlling emotion and following instincts.

"I'm always trying to collect as much as possible information. Usually the more you know the better is your decision."

"Informing myself, wying in all the aspects, good and negative. Considering the possible outcome"

"pragmatism, leaving out emotions of the calculation; sometimes purposefully not-deciding for an amount of time (especially in complex situations)"

"Pros and cons lists are right up there when it comes to personal decision making - it's all about trusting yourself to make the right call - and I've travelled well with these moments so far in my life"

"Evaluating criteria and weighing the options within a framework. Consulting with others to triangulate my position."

Question no. 16 aimed to identify the motivation in connection with making judgments. The answers comprised often positive feedback, visible results, successful accomplishment of the task and also financial motives.

"Visible results and promotions."

"I am motivated by the fact that I can help patients and hopefully see positive progress."

"Visible results, interesting projects and uplifting teamwork."

"- visible results like success of the students and satisfaction of the colleagues within my departement - creating something new and exciting and getting the proper feedback - internal evaluations"

"Motivation: being part of something big and relevant. Influence: access to information and team contributions"

"Grateful patients, visible effects, money"

Understanding driving motives can on the one hand convey clarity about how decision-making can be improved. On the other hand, motives that might compromise a good choice can be identified as well. Insofar, it is worthwhile to evaluate the factors that may influence judgment carefully.

The aspect of intuition was mentioned before. Here, the question no. 28 asks explicitly how relevant intuition is in professional contexts. The major part of respondents has a positive attitude regarding professional intuition. Most of them (27) state that it is sometimes useful, twelve respondents answered explicitly with *yes*. One person considers intuition in this regard as unprofessional and another answered also negatively. As discussed in the theoretical section, intuition is associated with gained professional experience. Probably, intuition is partly misunderstood as undesired irrational behavior and is therefore rejected. Question no. 34 belongs to this context as well. The question about what may support good judgment was answered multiple times with *experience* which is in consequence related to building intuition. Other mentioned factors were

having enough time, attentive thinking, a good team, a holistic view (information) and setting the right priorities.

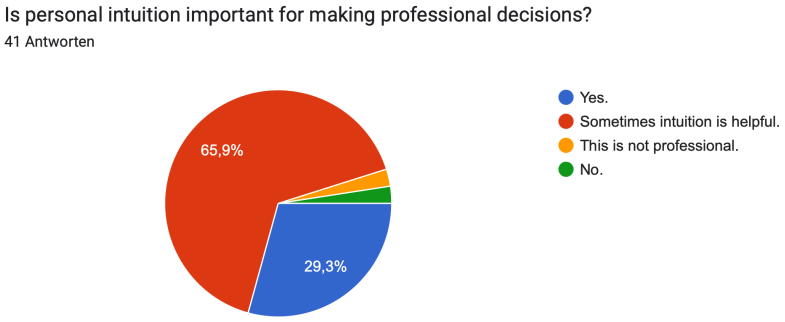


Figure 11. Responses to question no. 28

The thematic counterpart of the preceding questions is no. 33 with focus on factors that can hinder good decision-making. Among these factors, limited resources (time, information), hindering personal attitudes were mentioned repeatedly. Also stressors like a high workload, sleep deprivation and other restrictions were provided in the answers.

"Always resources: not enough time, not enough personnel, not enough information, basically uncertainty"

"Time-pressure, personal disharmony, sometimes hierarchy."

"Time pressure, cost-pressure and sometimes legal restrictions which have no meaning."

""cover your ass no decison making" lack in trust in others"[259]

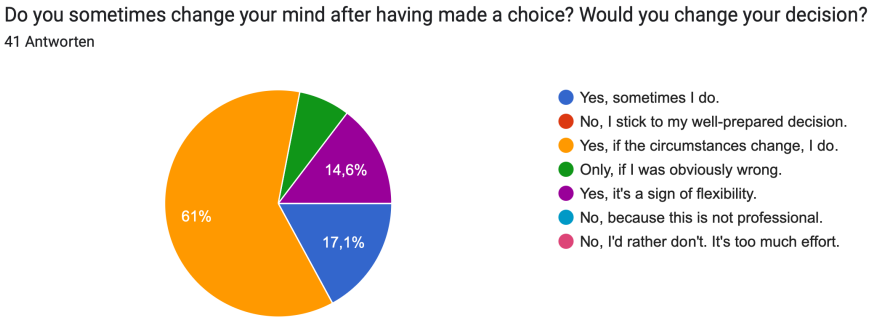
"Interruptions, work load, definitely unnecessary competition, time pressure"

"Time pressure, absence of guidance and preparation, last minute working methods, no flexibility and vision"

Question no. 27 deals with the issue of the revision of choices. This aspect is also of relevance in the present context. Being aware of the possibility to think over a choice, to have the general opportunity to change a decision, has effects on the entire process – similar to the management of failure. The answers of the respondents convey a

[259] This relates to the discussed phenomenon of defensive, timid choices.

positive picture and illustrate a high degree of flexibility. Most of the answers support to adjust the decision according to changing circumstances.



The larger set of questions no. 29-31 and 35-36 belong to the general topic of making *good* decisions. The respondents were asked to provide information from different points of view. Questions no. 35 and 36 both relate to giving advice. Thereby, one question focuses on advice in the private sphere, the other is with emphasis on the professional domain. These questions are of relevance, since they are guided by beneficial intentions for another person. Questions no. 30 and 31 describe indirectly the quality of a particular good and successful choice, or the negative counterpart, respectively. Question no. 29 poses the question directly.

– **Advice from Question no. 35 in personal matters**: take time, sleep, talk to others, listen to the inner voice, heart and brain, no rush, forecasting, critical reflection

"- Collect as much information as possible - Be ready to feed uncomfortable to make a decision - Trust yourself - Don't hesitate to ask people for help - It's better to say "no", if you aren't sure - Try to have a rollback plan in case things go wrong"

"trust in you"

"Be aware of your own motives, harness them and the emotions that they trigger, acquire knowledge, think strategically (in the sense of "long-term") and decide courageously. In case, learn, adapt and re-decide."

"sometimes purposefully allow time to sort things out for a while, but don't shy away from deciding for change when more

of the same doesn't work anymore. Leave the comfort zone in order for new opportunities to have a chance."

"To ask oneself what they would think about this decision in 10 minutes, 10 months, 10 years …"

"It's a well known quote : If it costs you your peace it's to expensive. It's kind of cheesy but it as a very important point: Can you live with your decision or not?"

- **Advice from Question no. 36 in professional matters:** guidelines, SWOT-analysis, taking enough time, exchange with colleagues, experience, patience, gathering of information

"Sleep.over it, be authentic, dont be afraid to make mistakes."

"Know your field. Analyse your Problem. Decide Major Pros and Cons. As soon as you aware of the riscs and benefits make a decison and stick to it unless Situation dictates otherwise"

"Gather all the relevant information, develop a plan together with your team for the best possible outcome, get all stakeholders on board with a clear logical explanation of the possible scenarios and why the selected decision would achieve the best possible outcome."

"In the aviation environment: trust the instruments, use the checklist, avoid "reflexes" when they are not the result of a "drill" (e.g. check flow in the cockpit followed by reassurance with the checklist), and suppress the gut feeling. In the military peacetime realm: decide with the mainstream and folllow the "King" when you want to be successfull in the long-term. Acquire knowledge, be courageous, take time for analysis but synthesize and decide contextually informed (versus contextually driven) when you want to move things forward."

The examples show essential commonalities regarding the requirement of sound information, an adequate timeframe, the opinions of other (experienced) persons, robust preparation and the assessment of possible outcomes. Insofar, these aspects can be identified as factors that contribute to good decision-making. In this sense, the question regarding a particular good choice can be evaluated as well. The answers convey an impression of satisfaction and pride in having made a right, often courageous, decision.

The counterpart is reflected in the answers to question no. 30, where aspects like regret, doubt, harm, damage, no decision, or defective decision are mentioned. The latter refers to uninformed, premature, unqualified, rushed, biased, ego-driven, irrational, externally influenced or even forced choices. The answers reflect a clear inner dissonance and discomfort due to the decision.

The characteristics of a good decision are associated with the following attributes: authentic, well-informed, balanced, evidence-based, quick, based on experience, rational, reflected. Some respondents answered more with the perspective on the results. Among others, success, happiness, good results, good feelings, saved money and the capability to solve a problem were part of the answers. The following examples reflect more detailed considerations of the respondents.

"A good decision aligns with your values, goals, and available information, leading to positive or intended outcomes"

"A good decision takes into account the necessary factors and is adequate for the situation it is intended for. It can be justified, the consequences have been considered, alternatives - if the time permits it - have been sought out and deemed nonoptimal. Furthermore, a good decision is one where everybody that is affected by it can at least understand why it was made this way. There are probably some more elements of it, but rarely will a decision have all of this properties since most of our decisions have to be made within a very small timeframe. Because of this, every decision where the decider at least tried to adhere to some of these points concept may be deemed a "good" decision."

"When I took my time to get the rational reasons, the guidelines and evaluate my intuition where it comes from and even switched my decision in this decision making process (like an argument with someone) and in the end I feel I did something that really works for my patient and is a smart investment for the future and not just short termed fancy and impressive. A good decision feels for me that I can still look in the mirror and know I am aligned with myself no matters how tough the situation and uncomfortable it was (professional and personal)"

The aspects of the fifth category mirrored decisions from various perspectives. The answers of the respondents were heterogenous, but consistent.

7.2 Analysis

After having systemized the received answers in the preceding section, the responses are analyzed in the light of the insights from the theoretical section of this work. The information is therefore **contextualized and interpreted** in correspondence with the theoretical framework of **decision-making**. The present section continues the structured proceeding according to the defined categories. For reasons of convenience, the brief reference information of the individual categories is provided repeatedly.

Analysis – Category: Personal criteria

Category P – questions: 1 (42), 2 (41), 3 (37)

Sub-categories PT, PD – questions: 12 (PT, 42), 24 (PD, 41)

Key-aspects from the responses: wide spectrum of age, diverse cultural backgrounds, positive attitudes towards intuition and gut feeling

The answers from the respondents regarding age mirror the entire life-cycle of professional activity. The spectrum of age ranges from 21 years up to 73 years and thereby covers the significant stages of professional biographies. Some of the respondents are at the beginning of their careers, the largest group of participants is in the middle of the professional activities and another part of the participants is already retired. The accumulated knowledge and experience over many years of professional activity represents a valuable resource for organizations.

The results of the question concerning the geographical roots and the current place of residence conveyed a heterogenous picture. The major part of respondents stated to live in their country of birth. The other part of the respondents moved to another country. The first group is associated with being born and having stayed in Germany. The other group moved in Europe or from more distant countries. The described cultural backgrounds were primarily associated with geographical criteria (home-countries, continents or regions) and (together with) religious affiliation. The answers from the questions 2 and 3 represent reference points for the association with the described cultural dimensions. Insofar, it is worthwhile to consider the international composition of teams – in relative terms – and the cultural backgrounds in the context of practical decision-making.

The topic of collaboration with others appears repeatedly in the context of decision-making. The important role of intact and competent teams for decision-making was underlined many times. A prerequisite for good collaboration with others may be the general affinity to team work or the preference for working independently. Insofar, the question aimed to clarify, how strong the affinity to work with colleagues is. The wide majority of probands obviously preferred team work. Insofar, this aspect is here, after the clarification through the received answers, of minor relevance.

The general opinion about the reliance on gut feeling and intuition were part of question no. 24. The assessment of these rather diffuse phenomena was of particular interest with regard to their possible considerable influence on deciding. The major part of respondents stated to have trust – although nuanced – in both. One person rejected unmistakably reliance on intuition and gut feeling. Intuition was discussed in the theoretical section as a result of gained experience and expertise. One respondent highlighted this connection and thereby acknowledged the particular value of intuition. The commented answers revealed a clear position about intuition in aeronautical decision-making. Here, reliance on intuition is considered to be unprofessional, and in terms of safety clearly not appropriate. Also the combination of intuition, gut feeling and deliberate reasoning was mentioned in the answers: Reliance on gut feeling in cases of insufficient information was answered by one person, whereby the decision then requires further assessment.

Analysis – Category: Education

Category E – questions: 4 (41), 5 (41), 6 (41)

Key-aspects from the responses: diversity of professions and qualifications, wide spectrum of years of professional experience

The focus of the second category was put on the broad field of education. The questions therefore aimed to gather information regarding the number of years of professional experience, the formal (academic) qualification in terms of degrees and the profession of the probands. The answers were categorized according to branches.[260]

The respondents belong to branches like aviation, medicine, military, law, administration, education, management and others. All of these professional activities are related to high responsibility; some of them more or less directly connected to human life. As discussed in the theoretical part, sound decision-making is of particular importance in these areas. But, the consequences of decisions in the other fields are not less difficult for those who are concerned with them. Insofar, decision-making requires professional experience and an educational foundation. Insofar, the degrees of the respondents are more than a sheer formal indicator. The span of professional experience ranges from one year of young professionals to more than thirty or forty years of the very experienced respondents. The correlation of experience and sound intuition was mentioned before. This may often be a solid basis for making decisions in a limited amount of time. This relates also to the assumptions from the field of naturalistic decision-making, where patterns are due to developed experience quickly recognized and good decisions attained.

The results reveal as well that some respondents are qualified in more than one field. This applies for example to those who have more than one academic qualification or

[260] This topic is again of relevance in the context of the category “organization”.

work in different professions (medicine, lobbyism, pilot and military administration etc.). The broader basis of knowledge, skills and professional experience from different fields represents indeed an advantage for approaching decisions.

Analysis – Category: Organization

Category O – questions: 7 (41)

Sub-categories OT, OE, OD – questions: 8 (OT, 42), 11 (OT, 41), 18 (OE, 32), 14 (OD, 41), 15 (OD, 41), 17 (OD, 42), 32 (OD, 39)

Key-aspects from the responses: hierarchical organization, organizational deciding, decisions and their consequences, management of failure

The third major category has its focus on organizational aspects and the consequences for approaching decisions. The major part of respondents belongs in their organizations to teams, even if some variety exists. Two probands declared by answering to question no. 7, to work independently. The team integration was already mentioned with regard to its positive effects on decision-making.

Question no. 8 related to the organization's general belonging to a specific branch. Additionally, the aspect of a rather national focus or international embeddedness was of interest. The responses allowed the categorization according to common branches like health-care, military, education, the public sector and others. The international component was of interest in order to detect potential points of intersections concerning cross-cultural themes in the working sphere. The answers revealed a differentiated scope: some of the organizations have predominantly national focus, others are of extended international range that includes inner-European or also global cooperation. This variation is related to global topics, the international nature of science and the international/global orientation of particular branches. The mentioned globalization of certain working spheres was mentioned before in the theoretical chapters. These facts indeed have implications for the practical side of cross-cultural collaboration and for the topic of decision-making as well. Insofar, the organizations may benefit from actively managing the cultural components in order to prevent frictions.

The respondents described in their answers to question no. 11 the organizational settings in two directions. Some confirmed a clear hierarchical structure. One respondent mentioned an informal hierarchy according to professional experience. Other respondents described more equal settings with flat or without obvious hierarchies. The perception of the personal role in the organizational framework or team is oriented on the criterion of leadership. Hereby, the persons in leading positions confirmed their status clearly. The answers of the other probands were more diverse. – The team structures are often related to the allocation of responsibility, reporting duties, delegation, and to the (formal) power to decide. The degree of inequality and formal distribution of power

may differ depending on the persons involved and on the organization itself. Military contexts, aviation, education and also medical care are organized in hierarchical form. This can be perceived from both internal and external perspective. One respondent mentioned, reflecting the practical side of hierarchy, the aspect of training of younger colleagues.

> *"Consultant Physician,/ Organizing and leading as well as educating my younger Team Members. Creating a efficinate and pleasant Work Enviroment together with my Colleagues"*

The answers to the questions no. 14, 15, 17, 18 and 32 are more directly related to decision-making from an organizational point of view. The questions no. 17 and 18 may be analyzed together, since both relate to the preparation of professional decisions. Hereby, the first question asked whether preparatory work for others is part of the respondent's tasks. The follow-up question no. 18 aimed to find out, how the preparation is practically made. The major part of respondents confirmed to prepare decisions for others. Thereby, the scope of answers was wide. Some respondents referred to formal aspects regarding the written preparation. Others mentioned explicitly to follow the clearly structured military decision-making process. Some probands declared that internal guidelines do not exist. The preparation of decisions for others may have significant effects on the final choice. This depends heavily in the quality and transparency of the preparation, since biases, conscious framing and the influence of personal motives can shape the result. Insofar, the vulnerability of the preparatory phase cannot be underestimated. Therefore, a transparent proceeding, internal standards, availability of sound information and the open communication can contribute to a robust preparation. The preparation is intended to relieve the decider from a considerable amount of work. Therefore, the decision-maker is dependent on the quality of the preparatory work in order to make an informed decision.

The questions no. 14, 15 and 32 are thematically connected. The first of the three questions aims to find out which decisions the respondents have to make in their professional context. The following question focuses on the consequences of the decisions. The third question refers to the topic of human fallibility and requests information regarding the professional management of failure. As mentioned beforehand, the organizational treatment of error influences, among others, how decisions are made. The fear of punishment or stigmatization may impair decision quality. The answers conveyed a heterogenous picture, but predominantly, the existence of an open error culture and a tolerant mind-set were part of the answers. The respondents emphasized the positive philosophy of learning from mistakes. A few respondents explained that they are (still) not satisfied with the management of failure in their organization.

The decisions in the context of the given category reflect the specifics of the branches. Insofar, medical decisions are related to health, wellbeing and life in general. The answers underlined also economic success like the reputation and the stability of the practice. Regarding the field of education, the success of the students and pupils is

one important aspect. Of course, the reputation of the institution was mentioned as well. Generally, the accomplishment of the tasks in an appropriate manner was the overall line of thought in the answers.

Analysis – Category: Team

Category T – questions: 9 (41), 10 (41)

Key-aspects from the responses: team diversity (professional, cultural), size

The category with focus on the team characteristics comprises two aspects: team diversity and team size. Most answers reflected the existence of diverse teams, whereby diversity is associated with the factors of gender, age, professional experience, qualification, nationality and cultural background. Thereby, the answers conveyed a neutral or positive perception of the team heterogeneity. The sizes of the teams differed as well. The range comprised the entire spectrum from small teams with under ten colleagues to large teams with up to seventy members. One independently working respondent expressed regret about not being part of a team. The team sizes showed also variability.

Generally, team cooperation is considered to have positive effects on deciding because of the division of labor which reduces effectively the workload and the possible professional exchange among colleagues. Good teams are perceived as strong – also due to positive synergetic effects – and because expertise, qualifications, experience and knowledge on different levels come together. Good team work is also capable of preventing or detecting biased thinking and defective decision-making. Team work may also facilitate learning from mistakes, since decisions can be collectively evaluated and constructive feedback can be given. These aspects are clearly only true under the premise of intact, transparent, cooperative and professional teams.

The team size may have an influence on the direct interaction. Probably, smaller and relatively stable (core) teams foster closer and more direct cooperation. The hierarchical structure and formal allocation of the power to decide is of relevance as well. This aspect is discussed more in detail in the context of the organizational parameters.

The influence of team diversity on decision-making is of particular interest regarding the following characteristics: age, professional experience and the cultural background. The heterogenous team composition with different ages and professional experience implies advantages for the team due to broader experience and expertise. More experienced/older colleagues can support others, in particular novices/younger colleagues with advice and training. The cultural diversity may play a role for decision-making when culturally determined perceptions and attitudes diverge significantly. As discussed in the section about the assumed different cultural dimensions, these factors require assessment in relative terms. Therefore, the specific cultural composition in the concrete case may be considered in order to avoid misunderstandings or frictions.

Analysis – Category: Decision

Category D – questions: 26 (42), 27 (41), 28 (41), 29 (41), 30 (41), 33 (40), 34 (41)

Sub-categories DP, DE – questions: 13 (DP, 42), 16 (DP, 40), 22 (DP, 42), 23 (DP, 38), 25 (DP, 42), 31 (DP, 39), 35 (DP, 38), 36 (DP, 37), 19 (DE, 42), 20 (DE, 42), 21 (DE, 39)

Key-aspects from the responses: rationality, decision quality, good advice

The fifth category of Decision combines many central aspects of decision-making. The topic of rationality was broadly discussed in the theoretical section. The perception that rational choices are of better quality was part of the preceding considerations. Here, the respondents were asked to provide their general opinion about rationality. Most respondents associated their decisions with being rational. The question whether rational decisions are better was answered heterogeneously. Partly, this relation was rejected. Both questions aimed to gain a general impression of the significance of rationality for the respondents.

Question no. 13 asked for the self-perception as a decider, which was predominantly answered positively. The personal perception of being an active professional decider reflects the conscious recognition of being capable to decide, to change and to have influence. Insofar, the information is of practical relevance with regard to making good choices.

The questions no. 19, 20, 21 represent the context of education in decision-making. The answers revealed that many of the respondents were not familiar with decision-making methods and were also not taught techniques for making choices. Besides many respondents who indeed are educated in this field, the lack of knowledge in this responsible part of professional doing is remarkable. The following question focuses on the familiarity with specific methods. Predominantly, methods like checklist application, the adherence to manuals and guidelines were mentioned. Also specific decision-making processes for aviation, medicine and aviation were named. These approaches were described in the theoretical section of this work. Familiarity and competence in the correct application is essential for meeting the high safety requirements in these areas. The questions no. 22 and 23 took a different perspective in order to gain an impression about decision-making in private contexts. Also here, respondents applied decision aids. Often these involved the exchange with others in order to facilitate decision-making. Factors like intuition, gut feeling, taking sufficient time and gathering of information were named besides the relevance of reasoning.

The answers to question no. 16 reflect what motivates and influences judgment. Many answers referred to visible results, positive feedback, successful accomplishment of the task, gaining experience, helping others effectively, experiencing gratitude, safety and financial rewards. As mentioned before, it is helpful to understand what

influences professional judgment in order to facilitate good decision-making. Of relevance was also the topic of such factors that can hinder or impair judgment. Here, the predominant relations were identified regarding limited resources, various stressors (interruptions, time-pressure, sleep deprivation etc.), the lack of sufficient information, and personal attitudes of colleagues. Therefore, it is of high importance to be aware of the effects of these adverse factors on making professional choices. As discussed in the theoretical section, decision quality can suffer considerably from time-pressure and other constraints. In certain cases, the revision of a choice may be appropriate. To this question, the respondents reacted with a high degree of flexibility.

A more comprehensive set of questions was intended to mirror decisions and their quality from different perspectives. Therefore, the distinction between private and professional decisions was made. Themes like giving advice to others, recalling good and bad choices served as practically oriented examples for variation in decision-quality. Insofar, the retrospective assessment of good or rather bad/suboptimal choices can contribute to understanding own decision mechanisms, personal biases, relevant stressors or personal preferences. These insights are also valuable experience – a source for learning – for others who are confronted with making decisions.

8 Conclusion

Good decision-making and how it can be achieved was the focus of the work. A holistic perspective was taken in order to assess and to understand the indeed quotidian, but complex phenomenon. Therefore, the first part of the work aimed to provide a theoretical foundation for the considerations. The second part added a practical perspective with the results from a qualitative study.

The investigation of the topic revealed an interplay of a plethora of facilitating and similarly hindering factors. Understanding these interdependencies and gaining clarity about what supports good decision-making was the overall aim of the present work. The literature and the answers from the respondents provided information about manifold factors that contribute to successful deciding. Among others, organizational parameters like the relevance of team-work, adequate management of human failure and the appropriate recognition of stressors and constraints were hereby of high importance. Targeted education and training for deciders was of relevance as well.

Obviously, the answer to the overall question *What is a good decision?* has to be answered in relative terms, since an absolute result does not exist. The quality requires an assessment in relation to the circumstances of the decision. This comprises the basis of information, the state of the decider, the stability of the environment and other aspects like uncertainty. The influence of the human factor cannot be underestimated; as seen, human fallibility has remarkable influence on the outcome – and its perception, respectively. Generally, good decisions are associated with a state of the decider that is free from doubt, inner dissonance or regret concerning the choice. Also other parameters help to assess the quality: the successful and satisfactory attainment of a desired outcome. Insofar, the answers that were given throughout the work can represent an answer in their sum.

Some recommendations for making good choices can be derived among others:

1) *Creation of awareness and management of stressors/constraints*
2) *Learning from mistakes*
3) *Prevention of decision fatigue, taking conscious pauses (prevention of sleep deprivation), management of the workload, setting appropriate priorities*
4) *Application of simple rules (checklists, reliable heuristics)*
5) *Education in techniques and methods, training, simulation*
6) *Sound information management*
7) *Precision in communication, clear problem statement, transparency*
8) *Leading by example, respectful, good teamwork, procedural discipline*
9) *Critical self-assessment*

10) *Development of ethical and cultural sensitivity in decision-making*

11) *Technical support for tedious routine tasks (e.g. AI)*

The considerations revealed many aspects of decision-making that are of potential for further investigation. The established models of decision-making are partially narrowed in their perspective on the purpose. The topics of ethicality and of cultural aspects are thereby rarely mentioned.

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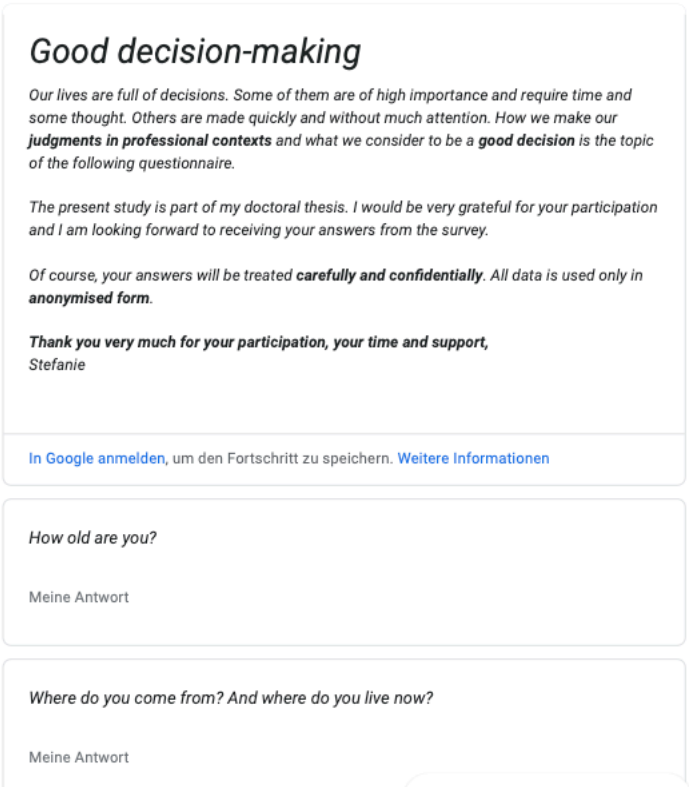
9 Appendices

The appendices include:

A. The questionnaire
B. A synoptic summary of all received answers from the participants
C. A picture of the card with the QR-code.

9.1 Appendix A – Questionnaire of the online-survey

See also online: https://forms.gle/BfvGpDKebKiLbjry9



Good decision-making

Our lives are full of decisions. Some of them are of high importance and require time and some thought. Others are made quickly and without much attention. How we make our ***judgments in professional contexts*** *and what we consider to be a* ***good decision*** *is the topic of the following questionnaire.*

The present study is part of my doctoral thesis. I would be very grateful for your participation and I am looking forward to receiving your answers from the survey.

Of course, your answers will be treated ***carefully and confidentially****. All data is used only in* ***anonymised form****.*

Thank you very much for your participation, your time and support,
Stefanie

In Google anmelden, um den Fortschritt zu speichern. Weitere Informationen

How old are you?

Meine Antwort

Where do you come from? And where do you live now?

Meine Antwort

What is your cultural background?

Meine Antwort

What is your education level/your highest (academic) degree?

Meine Antwort

What is your profession?
What is your current occupation and position?

Meine Antwort

Years of your professional experience:

Meine Antwort

*In which **branch** and in which **country**/countries does your organization operate?*

Meine Antwort

*Are you part of a **team**?*

- [ ] Yes
- [ ] No
- [ ] Sometimes (e.g. for specific projects)

How many colleagues are part of your team?

Meine Antwort

*Is it a **diverse team**?*

(e.g. qualifications, age, languages, cultures, different professional backgrounds, years of working experience...)

Meine Antwort

*What is **your role** in the team? Where do you see yourself? Is there a **hierarchy**?*

Meine Antwort

Do you enjoy working together with others?

Auswählen

*Do you see yourself as a **decider**?*

Auswählen

*What **kinds of decisions** do you have to make in your job?*

Meine Antwort

What depends on your decisions?

(e.g. the life and health of others, a competitive advantage, financial/technological success, the reputation of the organization, wellbeing of others etc.)

Meine Antwort

What motivates you and influences your judgment?

(e.g. visible results, bonuses, promotion, benchmarking, internal/external control etc.)

Meine Antwort

Do you prepare decisions for others?
Do you support others - like your superior - in decision-making with your contribution?

Auswählen

*If yes, how do you prepare a decision? Are there **guidelines**?*

Meine Antwort

*Are you familiar with **methods for decision-making**?*

- [ ] Yes
- [ ] No

Was decision-making part of your education?

- [ ] Yes
- [ ] No

*Which **methods for professional deciding/decision preparation** do you know?*

(e.g. internal guidelines, FOR-DEC, medical anamnesis, check-lists, manuals, OODA-loop, PDCA-cycle, Eisenhower Matrix, DMAIC-cycle etc.)

*What is **your preferred method**?*

Meine Antwort

*Do you use **decision aids in your personal life**?*
Do you sometimes write a pro and cons list or flip a coin when you have to decide something?

- [ ] Yes
- [ ] Never
- [ ] Sometimes
- [ ] I follow the advice of others.

What helps you best when making choices?

Meine Antwort

*Do you trust your **gut feeling**?*
*Can you rely on your **intuition**?*

Meine Antwort

Are your decisions rational?

- [ ] Yes, of course.
- [ ] Often.
- [ ] Sometimes not.
- [ ] I don't know.

Are rational decisions better?

- [ ] Yes.
- [ ] No.
- [ ] Maybe.

*Do you sometimes **change your mind** after having made a choice? Would you **change your decision**?*

Auswählen

*Is **personal intuition** important for making professional decisions?*

Auswählen

*What is a **good** decision?*

Meine Antwort

*And what do you think is a **bad** one?*

Meine Antwort

*What was your **best professional decision**?*
And why is this so?

Meine Antwort

***Making mistakes is human**. How is failure handled in your organization?*
Do colleagues tend to hide errors and fear consequences or is there rather an open error-culture?

Meine Antwort

*What **influences or even impairs** good decision-making? Do you experience **constraints**?*
What bothers you most?

(e.g. time-pressure, cost-pressure, legal restrictions, lack of information, stress, disturbances at your workplace, competition with others, hierarchies, fear, personal attitudes etc.)

Meine Antwort

*What **supports good judgment**?*

Meine Antwort

*What would be **your good advice for a friend** for a personal decision?*

Meine Antwort

*What is your advice for making good **professional** decisions?*
What is your golden rule?

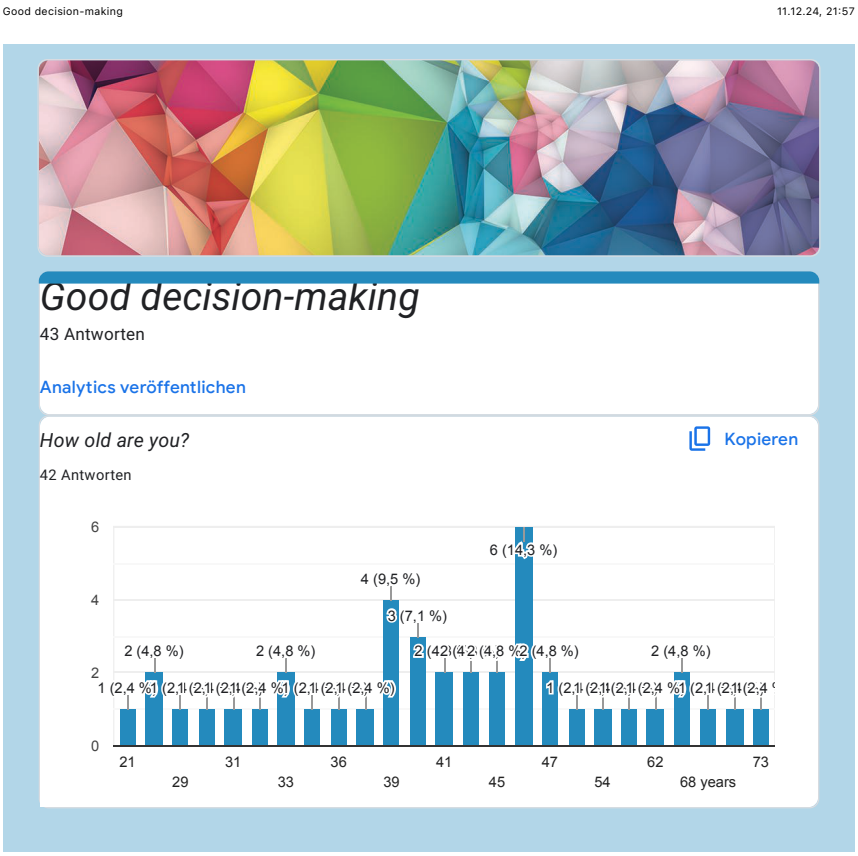
Meine Antwort

Thank you very much for your participation!

You can leave a note here, if you wish to.

Meine Antwort

9.2 Appendix B – Synoptic summary of the respondents' answers

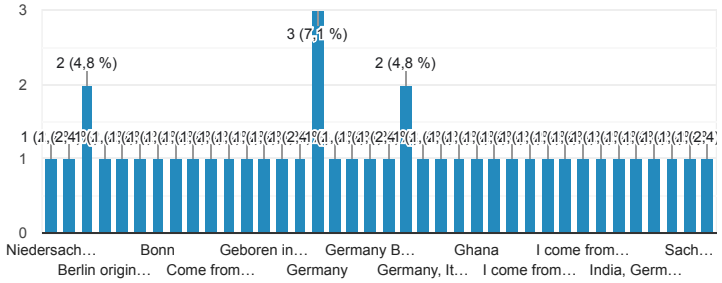


The online portal counted in total 43 answers. In doing so it included the pre-test. The answers from the test-run are not included. This means, that 42 participants are the reference value for the study.

Where do you come from? And where do you live now?

Kopieren

42 Antworten



What is your cultural background?

38 Antworten

German

german

Turkish

I was born and raised in a Russian family in a country that doesn't exist anymore (USSR). My parents had to work hard to keep the family afloat.

german-caribbean

?

German, Christian

White - Caucasian

Christianity

European. Christian. Grandfathers told from war and aimed their lives for peace.

Gut bürgerliche Sozialisation, katholisches Elternhaus, aber Austritt aus der Kirche

I was born and grew up in Germany.

deutsch, evangelisch

western-european

Western Europe

I'm German

Danish

African

European

Indian

Western / German in history, language, art, customs …

Roman Catholic

Israeli

Turkish

Humanity

Bin ein Mensch :)

Eastern European

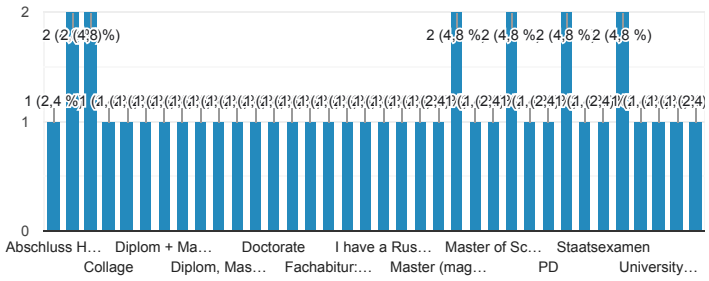
Italian language, kindness and Respekt.

Israeli

What is your education level/your highest (academic) degree?

Kopieren

42 Antworten



What is your profession?

What is your current occupation and position?

42 Antworten

Doctor

Dentist

Dentist / employed dentist

I'm a software engineer as dreamed from the age of 9 😄 Currently I'm working as a principal software engineer.

head of office

General Staff Officer and private flight instructor for commercial pilots

Jurist, now government official

General Staff Officer and Pilot

medical doctor, lobbyist, Head of EU & NATO Relations

Lawyer/Managing Director

Product Manager - my current role is Product Strategy Consultant, Customer Loyalty
Leitender Angestellter
Industrial Engineering and Energy Management. Working in the Energy Ministry.
Lehrer, Schulleiter
I was a lawyer until 2022 and I am now retired.
Consultant
Referent
CEO & owner
Senior physician
Physician; at the moment senior physician
Soldier, Staff Officer, Intelligence
Air Traffic Controller
Analyst
Teacher at High School.
I am Aircraft Maintenance Engineer by profession. Currently i am studying Masters in Aviation Management.
Dentist / owner of a dental practice
Polizist
Sales Manager
Psychologist
Physiotherapist I am in the final phase of my training.

Management. Design field.

Logistics Project Manager

Medical Doctor ICU/ Consultant Physician

Configuration Management

Derzeit MFA

Teacher

Political advisor

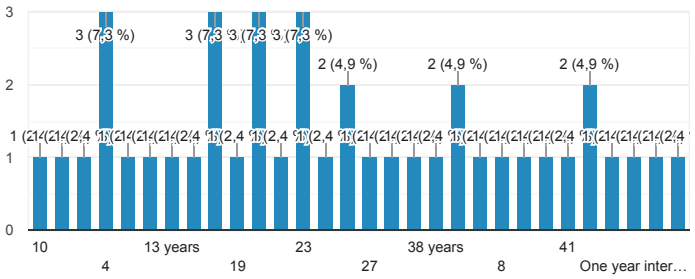
I am a language teacher.

Business development

Years of your professional experience:

Kopieren

41 Antworten



*In which **branch** and in which **country**/countries does your organization operate?*

42 Antworten

Germany

Medical care/Germany

Branch: software.

Country: Germany, but the company offers their products worldwide.
The company has people from all over the world.
politics, germany
Public service, non-profit, military, Germany
Germany, Health sector
Military Germany
Defence, Germany
Energy/German
Aviation, Dublin-based airline, operating globally
Defence Industry, Germany
Medical in Germany
Ministry of Economy and Climate Change. Operation on German, EU and global level.
Deutschland
My law office was in Berlin Wilmersdorf and then in Berlin Prenzlauer Berg.
Professional Service/Consulting
poltical branch, Germany
medical care, Germany
Telecommunications/Germany
Health Care, Germany
Medicine, Germany
NATO

Ghana

Defence; Germany

Education and Germany/Berlin

India

38

Consulting

School Psychology Germany

Only Germany

Germany

Latvia

Medicine/ Berlin Germany

Dentistry-Germany

Across the globe

Ausschließlich in Deutschland, sofern man meinen Arbeitgeber isoliert betrachtet. Medizin operiert aber global

Schools, Germany

Politics, Germany

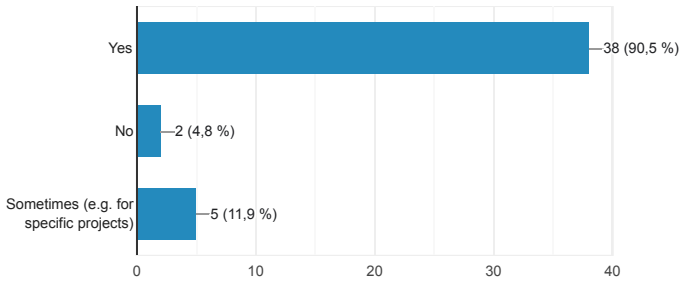
Germany - Economy, Law, Technik and Education.

Defence- Germany

*Are you part of a **team**?*

Kopieren

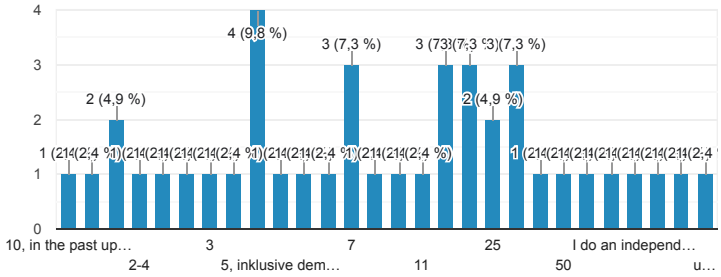
42 Antworten



How many colleagues are part of your team?

Kopieren

41 Antworten



*Is it a **diverse team**?*

(e.g. qualifications, age, languages, cultures, different professional backgrounds, years of working experience...)

42 Antworten

Yes

yes

Yes definitely except of age we are quite young
Absolutely! The team consist of people from India, Egypt, Croatia, Turkey, Ukraine. They all have different profession backgrounds.
Yes, as to professional backgrounds and working experience
Yes in terms of working experience
yes (qualification, age, years of working experience, different prof background, rank)
in general not really, most variation in age
Yes, very diverse, different qualifications, languages, cultures, nationalities, some with more work experience than others
No
Diverse qualifications online
Different ages, all German, mostly male. Ohne with Taiwanese wife, ohne with Italian wife.
Ja!
The colleagues were also lawyers, i.e. fully qualified with 2 state examinations under German law.
yes - age, cultures, different academic backgrounds
I think yes
Different age, nationality, culture, language, background, gender, experience and bias
N.A.
Certain qualifications are mandatory, but there has been an increase in lateral hires in recent years. Age and experience depend on the year of entry into the profession and vary from people who are about to retire (35 years of experience or more) to people who have just entered the profession (less than one year of experience). German is the predominant language, although we also increasingly have colleagues from other EU countries.

yes

My future team is very diverse. We have employees who speak different languages, as they come from different countries, as well as different age groups and areas of work.

ja

The people that work at the same place like me come from different countries, languages, culrures and backgrounds.

Small team gender diverse. Approx same age

*What is **your role** in the team? Where do you see yourself? Is there a **hierarchy**?*

42 Antworten

Flat hierarchy's. I am still in charge of the decisions of my treatment so there is a hier veya towards the assistance but there is my boss who is making the most important decisions that affect my working spectrum

The team doesn't have a formal hierarchy. The informal hierarchy does exist, though. It's mostly based of the professional experience.

coordinating / intergatred / yes

Head

Policy Advisor with own subject area, hierarchy in place

Team Leader, Command Pilot, Commander Flight Operations

mostly lead-advisory position within the team, thus outside of formal hierarchies

Head of team

I am a freelance consultant, so even though there's a hierarchy in the team, I only got in loosely as an external consultant

subject matter expert

Medical Director, Boss, yes

Youngest member of the team with longest experience in the private sector.
Vorgesetzter
We were all equal, but independent of each other.
Leading and coordination - no hierarchy
a role of equal status
employed dentist, flat hierarchy
There is no hierarchy
Yes, leader
Yes, the system is made that way. We senior physicians make the decisions and also teach and train younger colleagues
Analyst, team member
Working Area Sectors of the AIRSPACE. I see myself as a middle level manager by the end of the year. Yes there is a hierarchy.
One of the teamleaders
N.A.
I am the head of the human sciences departement. I oversee all the exams and curricualae, help colleagues, develop teaching lessons and coordinate the development of the school with the other departements. There is a clear hierarchy but it depends on how you use it. E.g., technically I am allowed to change the grades of the colleagues in my departement and can override nearly all decisions but rarely do so, because it would create a lot of friction. All in all I am the pacemaker of my departement and the expert to ask whenever something comes up.
Middle
I am the team leader, there is a flat hierarchy
Worker
team member

no hierarchy

Everyone is on an equal footing with us. Everyone does what they are good at. The only people who have a different attitude are the bosses. Otherwise, everyone is just as much an employee as I am.

Medium management and decision making

Leader

Consultant Physician,/ Organizing and leading as well as educating my younger Team Members. Creating a efficinate and pleasant Work Enviroment together with my Colleagues

There is a small hierarchy

CM

Mehrmals täglich den operativen Teil der Arbeit retten, da die Hälfte der Kolleginnen sich hinter Unzulänglichkeiten verstecken

No hierarchy

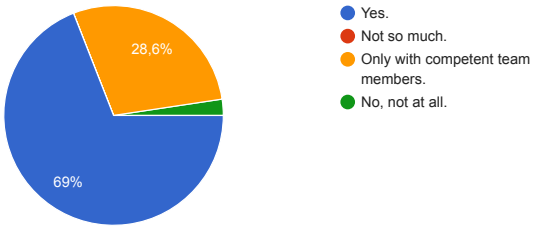
There is a light hierarchy, I am below in it.

I am only an associate teacher. Infortunatevi I haven't had any chance for a better job by my company. I could Imagine myself helping collegues with Moodle. Not everyone is good.

I am coordinating and facilitating communication

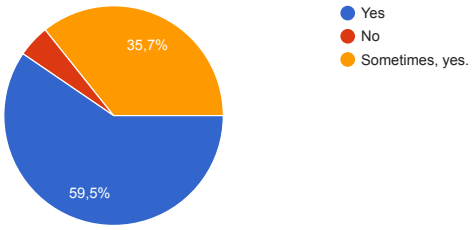
Do you enjoy working together with others? Kopieren

42 Antworten



*Do you see yourself as a **decider**?* Kopieren

42 Antworten



*What **kinds of decisions** do you have to make in your job?*

42 Antworten

Treatment options, time wise wise decisions, how to work my someone new, different ways of communications with different people in different positions, when / how to ask for things or sometimes delegate and sometimes decide to do it on my own.

It's mostly mostly related to technological choices. However sometimes I'm involved in hiring processes.

organisational

Military environment: choosing between options. aviation environment: frequent binary decisions between alternatives (yes/no).

Legal decisions and valuations
financial, technological, processual / as mil pilot: operating helicopter and tactical decisions
strategy-making within my field of work, building networks and claiming areas of activity
All kinds of
1. Prioritise digital product enhancements 2. Prioritise budget/ investment decisions for my product area 3. How to present business cases 4. How to position myself and the wider team to get critical business decisions made 5. Whom to influence in the organisation to get things done
how to create successful product related campaigns in a complex public procurement environment with multiple stakeholders
Medical
Decisions which information is trustworthy and which is only lobbying without good consideration of the whole picture and other aspects.
Viele unterschiedliche!
How do I enforce my clients' interests quickly and cost-effectively using the law?
I prepare decisions for our clients. I decide internal
preparatory decision to enable politicians to make political decisions
everything regarding treatment of patients
HR, Processes
Vital decisions
Treatment strategies, organizational decisions, delegation of tasks
Contribution to high-level decision making
Decisions ensuring safe, orderly and efficient flow of Air Traffic.

Medical decisions
administrative and communicative kinds
- supervise alle sorts of exams (regular and final ones) - make sure that comparability is given - identify and alleviate problems of all sorts in our teaching - specifying lines of development - differentiate between the students needs
Course of action to repair an aircraft.
in addition to administrative, especially the selection of therapeutic agents
No one
Creative decisions for marketing, strategic decisions for proposals concerning processes and sales.
e.g. specific help for pupils
In my profession, we have to decide which methods we use to help patients. For example, with manual therapy, massage, physiotherapy, etc.
Production, guidelines, timetable, project assignments
Critical decisions
Manly Overview and Planning of my Patients Treatment. Course of action regarding Education an implementing new developments on my Ward together with my Team members and the leading nursing Staff
My decisions form the therapie plan.
Finding solutions for daily problems
Das Wichtige vom Unwichtigen unterscheiden und Prioritäten nach Dringlichkeit setzen
What will happen if.. Where to go What to do How to teach things

What is best for
..

Organizational and content-related

Books to teach, exams, etc.

How and when approach people , what language to use.

What depends on your decisions?

(e.g. the life and health of others, a competitive advantage, financial/technological success, the reputation of the organization, wellbeing of others etc.)

42 Antworten

The life and health of others

The functionality of teeth and longterm health care of my patients, of course success for the clinic not to forget, reputation of the clinic and also the respect for qualitative treatments that effect the people who work with me that they stand completely behind me to work with me. Have somebody to look up to and not be ashamed or want to leave :)

It's mostly about technological success. However this indirectly influences financial success of the company. Luckily no lives depend on my decisions 😅

working of unit

Development of new military capabilities, competitive advantage, life and health of others

Outcome of legislation

situational awareness, achieve goals, strategic actions, Decision Making Process

my company's activities within the EU

Success of organization; well-being of organization and its employees

1. Success of the airline loyalty product (financially)
2. The positive feedback and loyalty of my frequent flyer customers
3. The amount of customers I acquire as well the amount of customers I retain
4. The use of technology to invest in and the underlying investment and running costs

commercial success of company
Legislation and economic playing rules
Basis einer guten Entwicklung meiner Schule
All these subjects were affected, medical, family, civile, criminal issues, but also economic problems.
Combination of profibility and firm values.
the reputation of the organization and wellbeing of others
all of the above. patients health, the succes of the business as a whole, treatment quality compared to others, reputation compared to others
Financial success, reputation,
Life and health
Life, health and well-being of others, younger colleagues learning success, project progress
Information and intelligence
Technological success, life and health of others, reputation of the organisation.
reputation of the organization and its members; strengthening of the german defence industrial complex
- students' success - reputation of the school because of certain projects (z.B. "Schule ohne Rassismus") - legal certainty and predictability of the lessons and exams generated - how money is spent within our departement
On time performance of a scheduled flight.
in particular the health of patients and the continued existence of the practice
Nothing
The awareness and reach of marketing campaigns and smooth operations of sales processes.

Well-being of others, school “career”

The well-being of other people depends on it. Our aim is to get patients pain-free or to get them back to their old state of movement.

Team capacity, time, availability, target audience

Different factors

Life and health of my Patients and my Team. Wellbeeing of my teammembers, reputation of my organisation

All of the Examples

tech

Die Gesundheit des Patienten vs. Budgetierung und Zeitmanagement

Life and health of others and of myself, wellbeing of others and of myself

Political processes and reputation of people I work for.

The everyone’s happiness.

Process working better, correct information flow for other decision makers, knowledge transfer done correctly

What motivates you and influences your judgment?

(e.g. visible results, bonuses, promotion, benchmarking, internal/external control etc.)

41 Antworten

The well-being of the people obwohl with, what makes the patient really happy to continue coming and really adjust what I suggested. Keeping bison and purpose for everyone

Visible results.

results, positive feed-back, to solve tasks successfully

Results, benchmarking, completion of a syllabus, self recognition

Visible results, making things better regarding my subject area
visible results, efficient use of ressources, precision, mission success
freedom of working hours/topics, trust from leadership to follow my own agenda
Results; feedback
1. Customer feedback and net promoter score 2. Hitting financial targets (revenues) 3. Stay in line with predicted budget/ costs to deliver my initiatives 4. Benchmark in the frequent flyer industry 5. My day rate as a freelance consultant
to challenge the status quo in a very conservative and risk averse industry
Experience, visible results
Selbstwirksamkeit and hopefully fair compromises between all stakeholder expectations
Stabile Schülerzahlen, gutes Schulklima, wenige Eingriffe von außen (z.B. von der Sculaufsicht!), Bestätigung
Visible results for the clients and a good reputation as a lawyer to stay current and achieve longterm success.
my personal judgement and client feedback
visible results
visible and felt results, medical standards, comparison to similar treatments
Helping patients to recover
Grateful patients, visible effects, money
Motivation: being part of something big and relevant. Influence: access to information and team contributions
Visible results, promotion, bonuses, safety
Help another people

personality traits, promotion, reputation

- visible results like success of the students and satisfaction of the colleagues within my departement
- creating something new and exciting and getting the proper feedback
- internal evaluations

Company cost

Treatment success as a result of teamwork

Cultural evolution

Visible results, interesting projects and uplifting teamwork.

Internal motivation

I am motivated by the fact that I can help patients and hopefully see positive progress.

Keeping a high standard, previous success, visible results, appreciation of working place

KPI

Results, Benchmarking and Promotion secondarily

Visible results and the salary

Experience

benchmarking

growing and wellbeing of others

My beliefs, my knowledge and my competence.

Visible results and promotions.

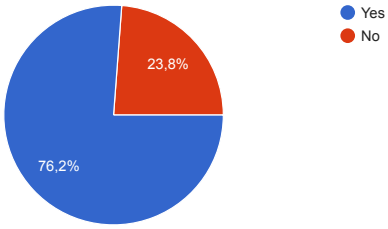
Needs of the company, internal discussions, previous knowledge

Do you prepare decisions for others?

Kopieren

Do you support others - like your superior - in decision-making with your contribution?

42 Antworten



*If yes, how do you prepare a decision? Are there **guidelines**?*

33 Antworten

Guidelines for treatments and when it comes to stuff it is my personal experience because I see people and their needs, I even feel when they change in behavior and seem to leave etc so I see it coming and ask what they are missing right now etc and try to be a bridge

There are no formal guidelines. My role assumes contributions in the form of proposal documents and mentoring for other engineers.

showing sides/alternatives; yes

Both guidelines and personal knowledge and experience

Just formal guidelines as in how a memorandum or note has to look like. Preparing decisions via writing notes, drafts and memorandums

yes, stratigic goals and operating procedures

one-pagers, breaking down complexity of topics for company leadership. no guidelines.

By supporting team/motivation etc./no guidelines

1. I communicate with my superiors
2. I propose solutions
3. I position my suggested solution so it makes sense for the business

4. I way up political nuances within/ outside the organisation
5. I follow ppt template guidelines, but end up using just the format to then fill it with my own words that are adequate for the audience I want to influence

No guidelines, but as a former Army Officer I use Bundeswehr's „Führungsprozess" that starts with „Beurteilung der Lage", the development of Course of Actions (Möglichkeiten eigenen Handelns), systemic analysis of these CoAs (pros/cons, common elements), resulting in an „Lagevortrag zur Entscheidung" (LVE) for the decision maker to make an informed decision

Medical guidelines

Yes. Minister, State Secretaries and Unit Managers require standardized preparation for meetings, presentations or decisions.

Viel Sprechen zur Klärung der Voraussetzungen für eine richtige Entscheidung

The law and my experience and ongoing training.

I follow the military decision making process. no guidelines

1. situation, 2. assessment, 3. conclusion

i assess the problems of the patients to refer them to the right specialist in the practice.

Yes, helping colleaques to come to a good decision

Yes there are, but I'd they aren't clear, I try and think of how I would decide and give my reasons for suggesting a way forward

Staff Standing operational procedures. Structured analytical techniques

Decisions are bases on standards and recommended practices pertaining to Aor Traffic

Guidelines

N.A.

Yes, there is the school law but most of the time it depends on the situations and problems which can vary wildly and situations/problems are seldom clear cut. It's a school with over 800 students and over 70 members of the teaching personnel, there can be no guideline for everything that can come up.

Collect Arguments in several kinds

By gathering all the relevant information from all stakeholders in order to inform decision makers about the status and also of possible outcomes.

No guidelines. I give my opinion and recommendations.

No, just what you need to do

Based on current medical knowledge. Deccision are made together with my team

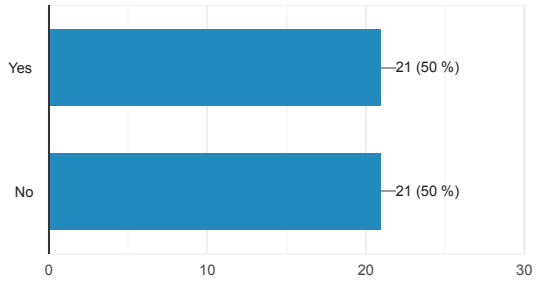
Richtlinien gibt es: lege artis zu operieren, d.h. sich an med. guidelineszu halten

No

Yes, there are normally internal regulated procedures. In terms of content-related issues, I focus on my own understandings of the things.

*Are you familiar with **methods for decision-making**?* Kopieren

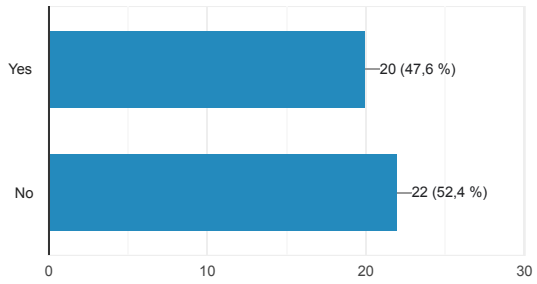
42 Antworten



Was decision-making part of your education?

Kopieren

42 Antworten



*Which **methods for professional deciding/decision preparation** do you know?*

(e.g. internal guidelines, FOR-DEC, medical anamnesis, check-lists, manuals, OODA-loop, PDCA-cycle, Eisenhower Matrix, DMAIC-cycle etc.)

*What is **your preferred method**?*

40 Antworten

Guidelines, check lists I prepared after experience

Check lists. They are simple and practical.

./.

Internal guidelines (command and control/decision process), check lists, aircraft manuals, Eisenhower Matrix, "R-I-A-O" (Recognize-Improvise-Adapt-Overcome)

I don't know specific one for my area of expertise

DMP (mil) / ODP (Operational Planning Guide), Eisenhower Matrix, OODA-loop,
Basis as Pilot: check-lists, manuals and internal guidelines (StandingOperating Procedures - SOP)

medical and military decision-making processes as named above (25 years experience)

Eisenhower Matrix et al.
1. I usually follow internal guidelines on how to successfully operate within an organisation 2. I also use my own personal check lists and manuals when it comes to decision making 3. There's no specific professional Method listed above that I use/ I am aware of, so I am more guided by trust in myself after nearly 20 yrs of professional experience in my area of expertise 4. It has served me well learning from others experiences, managers, superiors, peers but also from books talks and conferences
Führungsprozess, MDMP (US process), Effects Based Approach to Operations (EBAO, Airpower Centric), Operational Planning Process (OPP, military planning on NATO level, close to MDMP)
Medical anamnesis
I only know check-lists and manuals.
Check-lists
The guidelines were set by the law itself, plus my own internal check -lists for the employees. As a certified mediator, I have had to use a lot of psychological knowledge.
Führungsprozess der Landstreitkräfte in combination with Auftragstaktik
check-lists
i don't know any of these
Check lists, Eisenhower matrix
Knowing only internal guidelines
Definitely checklists, algorithms, guidelines
Operational planing process
Manuals, Checklists
Medical guidlines,
internal guidelines; don't know the other methods

This one is tricky since I am teaching evaluation and assessement of political processes and decisions and therefore know models for that (e.g. Massing or Kayser/Hagemann) - but these are not what is asked here but I think that accounts for decision-making?

Company checklists and manuals

in particular directives, guidelines and treatment regulations

Check-lists and guidelines

Internal guidelines, Einsehower matrix, Decision tree, forecasting, checklists, manuals.

Check-list and prioritise

I know the checklists and medical histories. Nevertheless, I prefer the checklists.

Don't know any

Check list, manuals

Guidlines, medical anamnesis

Dentistry Guidelines

PDCA

Professionell ist für mich sowohl beruflich – als auch privat. Das liegt vermutlich an der deutschen Sprache. Benjamin Lee Whorf war der Meinung, dass die Sprache das Denken und somit die Wirklichkeit definiert. Dem kann ich mich nur anschließen

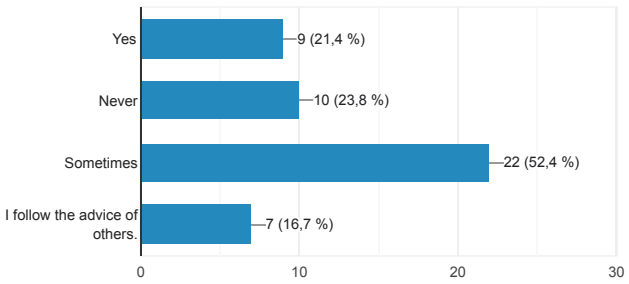
listening to my feelings, check-lists

Xxx

*Do you use **decision aids in your personal life**?*
Do you sometimes write a pro and cons list or flip a coin when you have to decide something?

Kopieren

42 Antworten



What helps you best when making choices?

39 Antworten

Getting the ideas and experiences of my many friends with more experience and evaluating all

I'm always trying to collect as much as possible information. Usually the more you know the better is your decision.

information & intuition

Contextual experience, intuition based upon acquired knowledge, deep thinking, evaluation

Informing myself, wying in all the aspects, good and negative. Considering the possible outcome

planning, situational awareness and prioritization / Eisenhower Matrix

pragmatism, leaving out emotions of the calculation; sometimes purposefully not-deciding for an amount of time (especially in complex situations)

Good Basis of information

Pros and cons lists are right up there when it comes to personal decision making - it's all about trusting yourself to make the right call - and I've travelled well with these moments so far in my

life
Experience, sufficient information, but what is sufficient? 99%? 99.9%? 99.99%?
Intuition
Broad information.
Mit anderen Sprechen, beim Reden mit anderen mache ich mir selbst klar, worum es geht und was richtig sein könnte
My inner voice and mu catalog of values.
discussion with family and friends
weighing up and information
most often rational thinking and sometimes my gut feeling
Considering alternative solutions
Personal experience and knowledge
My instincts
Advantage of information
Experience,follow the advice of others
dialectical dialogue
Evaluating criteria and weighing the options within a framework. Consulting with others to triangulate my position.
knowledge, experience, intuition
Education
Research and time.
My intiution

Sometimes I use pros and cons lists to make sure I'm making the right decisions.

Making an excel table. Overview ingredients yearly plan, talk to my superior and my workers

Take a cup of coffee

Ration and Reasoning

My bestfriend

Risk

Talking to friends, familiy or collegues about it

Responsibility

Time to think and my husband's advices.

Thinking what happens if the situation sdoesnt change

*Do you trust your **gut feeling**?*
*Can you rely on your **intuition**?*

42 Antworten

Yes

yes

Sometimes

I trust my gut feeling and intuition with people and their well being bir with professional decisions I have to write down and read guidelines

In cases when there isn't enough data to make an informed decision, I do rely on gut feeling. However decisions based on gut feeling are taken with extra care and further"monitoring".

Yes, in the military environment. NO, in the aviation context

yes, based on experience, but being aware that feelings sometimes can be wrong, so stick to the rules and violating them should be a proper action after analyzing the sitution and rational decision.

That are the basic rules of an Pilot in every situation:
1. Maintain aircraft control
2. Analyse the situation
3. Take proper action

Aboslutely. Most of the time, yes. Sometimes I wait decisions out in order to sort out what's gut-feeling and what's on the mind, so to say. Usually clears up the picture after some nights' sleep.

Yes. Often

Yea I do, fully confident

Yes, Bauchgefühl

Partly.

Ja!

Definitivly

both yes

sometimes

Yes

Professionally, yes

Gut feeling is good. Basically this reflects your professional experience. It has to be challenged by a peer group and developed with analytical methods.

Sometimes

no; no

Sometimes, it depends on the situation and how much time is given for the decision.

Yes, mostly

Depends on the decision. Rationalizing first helps but I also follow my intuition and gut feeling sometimes.

Sometimes. Nevertheless, there are sometimes things where you think about it a little longer and still don't listen to your gut feeling.

Usually not, but im trying to change that.

Not everytime

Mein Bauchgehirn

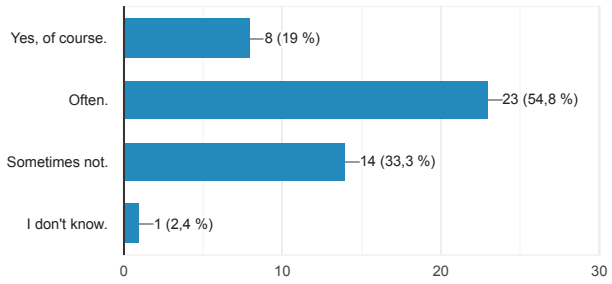
Most of the time

Yes, 90%.

Are your decisions rational?

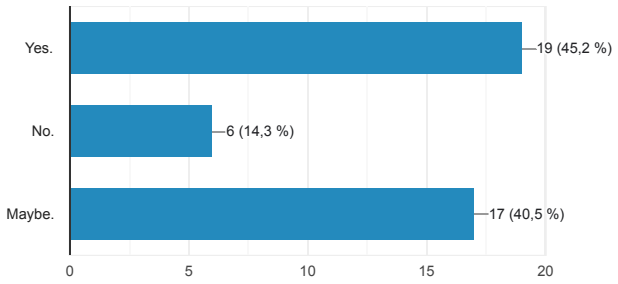
Kopieren

42 Antworten



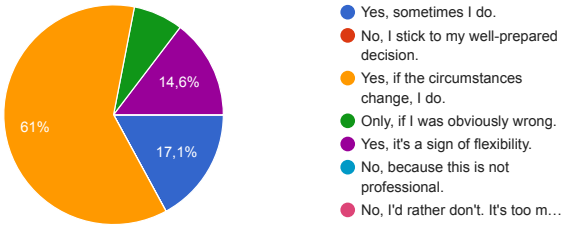
Are rational decisions better? Kopieren

42 Antworten



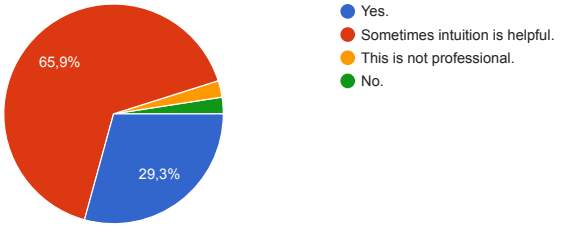
*Do you sometimes **change your mind** after having made a choice? Would you **change your decision**?* Kopieren

41 Antworten



*Is **personal intuition** important for making professional decisions?* Kopieren

41 Antworten



*What is a **good** decision?*

42 Antworten

When I took my time to get the rational reasons, the guidelines and evaluate my intuition where it comes from and even switched my decision in this decision making process (like an argument with someone) and in the end I feel I did something that really works for my patient and is a smart investment for the future and not just short termed fancy and impressive. A good decision feels for me that I can still look in the mirror and know I am aligned with myself no matters how tough the situation and uncomfortable it was (professional and personal)

It's the one that make everyone happy 😊

satisfying most, easy & comprehensive

Particularly in the aviation contexxt: behaviour and actions that are taken, lead to the desired effects.

a informed, reflected and well balanced one

a decision that gives orientation and stability to solve problems

one where gut-feeling and logical arguments align. one, to which you can stand no matter the outcome (or even in spite of it). and one, where any kind of decision was actually made.

Rational one based on full information- and in accordance with feeling

A decision that's been made with full confidence after weighing up the pros and cons and circumstances surrounding it

If it helps to successfully accomplish what you set out to do, in my case, if my campaigns run smoothly resulting in commercial success = my company makes money

A decision based on experience

A good decision is an informed one, i.e. all negative aspects are taken into consideration and weight carefully.

Mit der ich mich wohl fühle und ich wahrnehme dass sie Erfolg bringt und andere die Entscheidung nachvollziehen können!

Professionally, when the task has beenncompleted optimally, privately, when the people I care

about feel comfortable. Then I'll be fine too.

based on information, speed

a win-win situation if possible

a decision made on rational assessment of all factors that every body can agree on. it should also better the circumsances for all parties involved

A decision I feel safe making

Which is well-thought and eventually based on guidelines and evidence

A decision that leads to good outcomes and has benefits for everyone involved

If it contributes to success

A decision that yields the good results intended.

Successfully solving a problem

depends

A good decision takes into account the necessary factors and is adequate for the situation it is intended for. It can be justified, the consequences have been considered, alternatives - if the time permits it - have been sought out and deemed nonoptimal. Furthermore, a good decision is one where everybody that is affected by it can at least understand why it was made this way. There are probably some more elements of it, but rarely will a decision have all of this properties since most of our decisions have to be made within a very small timeframe. Because of this, every decision where the decider at least tried to adhere to some of these points concept may be deemed a "good" decision.

That saves vompany money

one that leads to the desired success quickly and easily

With good feelings

A good decision strives to achieve the best possible outcome based on the all available relevant information, taking into all the stakeholders into account and following a plan. Also a decision made without disregarding the flexibility to change the decision in the future if it is possible.

Getting up early enough to be on time

For me, a good decision in my profession is when I can see that I have been successful with the patient.

A decision that takes as many parameters as possible into consideration and / or is an outcome of experience.

A good decision aligns with your values, goals, and available information, leading to positive or intended outcomes

Well informed

A certain one

when end results are good

Eine Entscheidung nicht zu hinterfragen

You never know

A good decision is the one that brings success and happiness.

To think about it, sleep and then think again about it and take a decision.

An authentic one

*And what do you think is a **bad** one?*

42 Antworten

With a direct regret and strange gut feeling that is permanently appearing eventhough I try to convince this might be the best thing to do - most of my experience it was not the best decisions and there would be a different way. A bad one could be also one where I knew I was not sure but did not take the time I needed and rushed

It's the one that leads to irreversible problems/damages.

complicated, unstructured, a one which is imposed

No or undesired effect in the long-term.

One that doesn't consider the previous mentioned criteria
a not understandable decision whithout situational awareness (method trial and error)
unpurposeful non-decisions. harmful decisions tend to be bad (but sometimes you need to choose a lesser of two evils depending on the overall goal)
Not based on information, not rational
An irrational decision that has not been thought through and where circumstances, internal or external, were not taken into consideration
Vice versa: if I took a decision that was not at all helpful
A fast one
A decision that devides people and is not the best for the mainstream or disadvantaged groups.
Gegenteil der guten Entscheidung
The contrary
no decision
a decision that was made too late
erratic fast decisions made on how you feel at the moment, without regarding the consequences
Decisions made to please others
Decisions made on personal reasons (e.g. ego-driven)
A bad decision is one that harms others or myself
If it is based on bias and no collaboration
One that doesn't yield good results.
No successfull solution to problem with negative consequences

depends

Decisions that were made rashly and don't achieve the goals they were intended to because of that. Decisions that do objectively more harm than good for selfish or whatever reasons. Decisions which damage the team or organization for no apparent reason or willfully so or pay no mind to damages that could be brought because of them. Decisions that were made by nonqualified personnel. Decisions that actively harm persons, the environment or anyone or anything for personal gain.

That costs company money

a selfish

With doubt

A bad decision would be the opposite meaning, it would not be based an all the available relevant information, not taking all the stakeholders into account and without following a plan. A bad decision also disregards the flexibility to change in the future, if change is possible.

drinking too much

When I realize that I have not yet been able to help my patient and therefore have to look at different methods to see if I can help the patient.

A decision that is harming something/ someone, or is done solely for personal gain.

A bad decision ignores relevant information, rushes judgment, or disregards potential consequences, often resulting in negative outcomes or regret

Uninformed Decsion

No decision

its only experience

Das Gegenteil der vorherigen Frage

A one which obviously hurts others

The one that you regret about.

To make decisions fast and without thinking.

When I try to fit to others wishes and perspective but Sontag believe in it myslef

*What was your **best professional decision**?*
And why is this so?

40 Antworten

My best was: to go the educational way I did. against all opinions. I always feel excited about a way not a lot of people would go especially when my gut feeling tells me this is an exceptional chance (applying for working positions with specialists where nobody would dare and trust to have a chance) these moments where I stepped out of my comfort zone believed in me and got the chance because someone saw me and I really took the chance was uplifting me. Giving my all the trust in further decisions and not being shy about risks it is like a training of my gut! Because it was a decisions where my excitement and the adrenaline was at my max. Best was also: going for the things I love - like aesthetics / art and not feeling suppressed to do what everybody expects me to do - made my professional life despite any hard times easy because I do things I am passionate about

It was a decision to become a software engineer.

./.

?

Changing the division to do more substantial work regarding law making

The combination between Pilot and General Staff Course because that gives a wide spread of experience.

leaving the military after 25 years even though I was very much adjusted to being part of the system, because I broke free of an ineffective system that was decision-making averse on a top level

To study international business and spend 2 years in Mexico City. It loosened me up, it opened me up, it made me the person I am
Today…international multilingual open minded engaging and professionally successful

Decision making happens constantly. Probably I took thousands decisions, so I dont know.

To study medicine

Not to allow special laws for electric car charging without considering all new technologies

like e.g. home storage systems. Reason: It is important for decision makers to consider the whole picture and not only a small (already advantaged) group.

Die Leitung meiner letzten Schule anzunehmen (ca 10 Jahre vor meiner Pensionierung)

Having studied law because I was suitable for it and could help a lot of people.

to discover different professional environments

every decision for which i am allowed to bear the responsibility

i can‘t think of an exceptionally special one

To found a company

Well-thought and based on evidence. When I can clearly explain my decision. It must be transparent.

Taking this career path

Can't say

Deciding to undergo requisite training to take on more tasks.

To become a Doctor and work anf help other people

pressuring colleagues when it was necessary to achieve the goals of my employer; it was measured, precise behaviour and not impulsive and egotistical

Taking the helm as head of departement after being there for only 8 or 9 months. The departement was in disarray and after some pretty rough first years and some major miscommunications (talking about bad decisions...) now the departement is one of the most respected and accepted by the colleagues and students as well. Interactions with each other are pleasant, we've established criteria and guidelines for nearly all relevant processes and exams, the results are widely accepted and comprehensible, we almost never get sued because of grades.

Decision on the basis of experience.

Training and promotion of young talent

My best decision concerns the way I want conduct myself professionally; by constantly

deciding to strive for improvement and to be a positive contributing member of a team.

Taking a child out of the family, the decision had the Jugendamt of course, but I helped

When I decided to use my own option with my patient, even though some experienced people advised me not to. Nevertheless, I realized that it was the right decision and that I was able to help the patient.

As a freelancer I decided to create my own designed products and it was a life changing experience.

Open Conmunication with my Team Members and the Patients and there Relatives in my Care. Making Sure that I am understood when speaking as an proffessional to my entrusted Patients.

Hard to say

every thing

Meine beste berufliche Entscheidung ist die stetige Weiterentwicklung, das entspricht dem Prinzip der Homöostase vs. Heterostase bzw. der Salutogenese. Das betrifft jedoch auch den privaten Aspekt. Ich lass mich gerne leiten

To start travelling and to start working on ecological projects with students because it lets them grow and it can change the/their world

I hope my best professional decision is still ahead of me :)

To leave some of the schools where I taught. It was too much and no more healthy for me.

Not to be afraid to take the space I need.it allowed me to devlope and promote myself

***Making mistakes is human**. How is failure handled in your organization? Do colleagues tend to hide errors and fear consequences or is there rather an open error-culture?*

41 Antworten

In the past the way I experienced the failure mentality in Med school and life was horrible. Failure was not seen positive, more weakness, afraid to ask any questions! Was just not raising my hand and therefore missed chances to learn. Now I feel so comfortable because we have

that open error culture and my stress level is low, I am joyful and I learn a lot

Every mistake and failure is usually treated a lesson. Such lessons are being analysed to understand how to do better next time. There isn't any need to hide errors. It's better to learn from them.

everybody learns from mistakes

Military peace time environment: insufficient and shortsighted error culture leads to organizational stalemate. Aviation context: Crew Resource Management (CRM) is a sophisticated framework to uncover mistakes and error to the favour of aviation safety.

Open error culture in team

Crew Ressource Management and Error-Culture to increase Flight safety

It's not communicated and pops up again a lot later, e.g. in HR decisions. Not really ideal.

Open error-culture, still some try to hide mistakes

Failure isn't handled particularly well
I'd say, it's more like we're
Trying to hide it when it happens rather than being open and honest about it. It doesn't affect me much though as I am external, and I just consult the business, but at the end of the day it doesn't help on building an open culture where successes and failures are equally accepted and to be learned from

An open culture, tolerates mistakes if we learn from them and dont do them twice.

There is an open error culture

Mostly not, Unit Manager promotes that making mistakes is human.

Ich gehe von einer offenen Fehlerkultur aus!

A lawyer is always faced with mistakes he/she makes, because the opponent ist waiting for this situation in order to file a new lawsuit over ist against the lawyer. You have to be very attentive!

No - we have a positive failure culture and a good learning culture

there is an open culture of error and superiors stand up to you if you make the wrong decision

no there is no hiding. errors are always communicated openly
Colleagues are encouraged to see mistakes as a step in their personal development
Relatively open culture, but still could be improved
No I think there's a good culture of not asking who was wrong but what was wrong. Mistakes are documented and analysed, but they happen to learn from them
Inside the team we work very open minded and without constraints.
Mostly people don't try to hide errors because the results may be almost instantly visible. However, the concept of Just Culture is gradually being embraced in the organisation.
Debriefing
open-error culture
It depends on the circumstances: Failure to meet a deadline that was communicated months ago is a problem, since a lot of the following processes depend on them. Honest mistakes are discussed and most of the times don't happen more than often; at least in my departement. How this is handled in the other departements depends on the personnel.
Due safety it is an open error culture.
Mistakes are discussed openly in the team without consequences for the person responsible in order to avoid a repetition
Tend to hide mistakes
Rather open
Everyone here is open about it. We have weekly team days where we discuss such cases and can also get help and tips from other therapists. If we make mistakes, this is addressed, but there is no threat of warnings or punishments.
Varies from one person to another. Many hide mistakes and many take responsibility.
Open error culture and working on mistakes
Its not yet open error culture , but getting there.

We can discuss about our mistakes and next time we can do it better

Lesson leaant

Dahingehend herrscht eine weitgehend offene Kultur, eine transparente Kommunikation ist hierbei mitunter hilfreich

Collegues fear consequences

There is rather an open error-culture. I just try to do my best, and, because it is so, there is anything bad about a mistake I could made.

I think everyone try to understand the others. I did not receive any complain when I did mistakes .

N.A

*What **influences or even impairs** good decision-making? Do you experience **constraints**?*
What bothers you most?

(e.g. time-pressure, cost-pressure, legal restrictions, lack of information, stress, disturbances at your workplace, competition with others, hierarchies, fear, personal attitudes etc.)

41 Antworten

I think fear! Personal attitude to think you know already everything, not being organized enough and time pressure sometimes if not well rgnskzed in your head.

Lack of information and probably personal attitudes.

insufficient input, hidden infos

Personal decision making is the results of the power of an individual's motives and the degree to which the individual is able to harness them in a given decisive situation. This results in "personal attitudes". In my case, it is - in the military context - the retention of information, obvious "broadly accepted" incompetence and "detailing" that suffocate successful and resilient strategic decisions from the start.

almost all of the criteria mentioned in the clamps as e.g.
good communication, clear operating procedures, personal attitude, training, training, training
personal agendas and egos which are prioritized higher than an overarching goal
1. Time pressure definitely may impact rational decision making 2. There's usually pressure as well To deliver against business targets, ie revenue, acquire customers, activity rates, rentention rates etc 3. If you don't deliver a strong enough ROI you may not receive additional investment to further enhance your product which is bad news for me and the end consumer
Always resources: not enough time, not enough personnel, not enough information, basically uncertainty
fear, lack of information
Time-pressure, personal disharmony, sometimes hierarchy.
Zeitdruck führt nicht zu guten Entscheidungen
Time pressure, cost-pressure and sometimes legal restrictions which have no meaning.
"cover your ass no decison making" lack in trust in others
lack of information and legal restrictions
fear, shame, pride, strong negative emotions in general
Personal attitudes
Cost-pressure and time-pressure, stress
Interruptions, work load, definitely unnecessary competition, time pressure
Time-pressure produce often incomplete decisions
Stress, hierarchies, lack of information
Time -pressure

lack of Information and insight, fear

The examples given sum it up pretty much: time-pressure, legal-restrictions, animosity etc., lack of sleep and generally everything that impairs the well being of a decider. In my workplace the legal restrictions are nearly set in stone, therefore any decision that would conflict with this is doomed to fail. Therefore sometimes good decisions cannot be made, only half-good or really bad ones since there is no wiggle room.

time-pressure, cost-pressure, legal restrictions, lack of information, stress.

Time pressure, administrative constraints, lack of information, disruptions at work, personal attitudes

Stress, competitions, fear

The examples given and also the unwillingness to listen and change from stakeholders could constraint good decision-making.

Time pressure, personal attitudes

It particularly bothers me that we only have 20 minutes of therapy with some patients and are not particularly well paid.

Time pressure, absence of guidance and preparation, last minute working methods, no flexibility and vision

All of the above impares good decison making

Time and cost pressure

Power to make the decession

Im Grunde alles davon

Time, stress, emotions

Time, cost pressure and stress for sure.

Time pressure and competition with others.

Legal and political

*What **supports good judgment**?*

42 Antworten

Experience
I think here it comes from your experience, family education, being reflected and exposed to different perspectives.
Experience, empathy, ability to look at things from a different perspective.
results, comprehensive colleagues & supporting superiors
Acquired knowledge, the courage to question the perceived "obviousness" and oneself alongside with the stamina and resilience to position yourself outside the box.
time to think, good decision making environment, motivation
situational awareness, knowing rules and operating procedures, training, professionality
goal/decision-oriented discussions, openness about risks, rough sketches on contingency measures
Full knowledge of situation and consequences
1. Knowledge and facts and understanding 2. Numbers 3. Experience and to understand the competitive landscape 4. Political nuances within the organisation
experience?
Support from hierarchy if they believe in you.
Offener Austausch aller Beteiligten darüber, was anliegt und notwendig ist!
Good training but also human skills
big picture information and a great workforce which is lead by trust
a good education and experience

knowledge, supportive surroundings, a growing-state-of-mind environment
Time to think
Clear mind and keeping a cool head
Advice from someone with experience
A good team
Relevant background information
fearless and attentive thinking
Not taking things personally, take personal bias into account, being well informed, include different perspectives, be aware of the framework you're working and deciding in. Accept that everyone can make mistakes, even you yourself.
Patience.
knowledge and empathy
Arguments
Access to relevant information, fairness and morality, empathy, consensus seeking mentality and the ability to discern between rational and impulsive thoughts.
Enough sleep!
I think that in our job the other therapists and others in the medical field are the best judges.
Guidance, planning, realistic deadlines, holistic view.
Logic
Knowledge of your field - be it private or professional-
When all of the colleagues think the same
Priorities

Erfahrung und Zeit

Time to talk and for thinking

Conviction in one's own competence.

Good judgment supports good judgment. And experience of course.

NA

*What would be **your good advice for a friend** for a personal decision?*

39 Antworten

Honestly, personally: I would always ask if you feel your gut the first moment you asked yourself the question. What helped me the most: you don't have to react immediately and decide take some days where you don't think about it and then feel again what your gut says- there is a time where pressure/excitement etc is so loud we cannot listen to ourselves we need time to go down with the system to be more clear. And would you regret it? What do you have to loose and what are the chances that it will work?Do I identify with these people etc

- Collect as much information as possible
- Be ready to feed uncomfortable to make a decision
- Trust yourself
- Don't hesitate to ask people for help
- It's better to say "no", if you aren't sure
- Try to have a rollback plan in case things go wrong

trust in you

Be aware of your own motives, harness them and the emotions that they trigger, acquire knowledge, think strategically (in the sense of "long-term") and decide courageously. In case, learn, adapt and re-decide.

Strongly depends on the decision that has to be made. Maybe to not only consider the impact the decision has on yourself but also on others inflicted by the decision.

analyze the situation, take proper action and stick to the plan

sometimes purposefully allow time to sort things out for a while, but don't shy away from deciding for change when more of the same doesn't work anymore. Leave the comfort zone in order for new opportunities to have a chance.

Much information; hear other opinions based on the information; trust feelings

Trust your instincts and go with what you feel is right for you

To take time and do „Führungsprozess“, starting with BdL trying to gain as much information as possible for the problem at hand.

Take enough time

Inform oneself well, take a well-informed decision and stay close to this decision as long as there is no completely different information/situation.

What are your most important goals and wishes, and how are these preserved or jeopardized by the decision, you are going to take?

trust your feeling and discuss with family and friends

take your time and talk with good friends

treat others like you want your best friend to be treated and act accordingly

To ask oneself what they would think about this decision in 10 minutes, 10 months, 10 years …

It should be well-thought

Don’t rush it

Work in a team. Don't consider yourself as infallible

To analyse all possible inputs or data properly and using them to make a good decision

Experience,cooperation,mutual respect

take on a strategic, long-term perspective that supports investing in one's own personal future

It's a well known quote : If it costs you your peace it's to expensive. It's kind of cheesy but it as a very important point: Can you live with your decision or not?

Self satisfaction

Turn on your heart and brain

Try to imagine the utopian outcome and use that scenario as your north-star.

Sleep over it

I think my best advice would be to listen to his gut feeling.

Gut feeling and previous experiences

Prepare for the worst and best possible outcome your decision could potentially lead to. If you can handle this you are in my opinion prepared to go ahead .

Trust your guts

5D

Höre in dich rein

Listen well to others and trust your feelings

To listen to your own heart and mind.

Think a bit about that, sleep, think once more and than take the decision. Trust in you. And if you fail remember: we are only humans (afterall).

Yes

*What is your advice for making good **professional** decisions?*
What is your golden rule?

38 Antworten

It comes close to my personal because I identify (unfortunately) very much with my profession in terms of my expectations of fulfillment in life. I am trying to do my work in the same personal way : creative, finding a personalized solution where people feel seen etc but I would rather say my advice would be something else: writing more pros and cons, vision boards where I want to be and what this means for my decisions. What do I need . My golden role is still being integer and always somewhere where I am free in my personal growth and wher i see the potential of development

Never stop learning.

exchange with others. be on time.

In the aviation environment: trust the instruments, use the checklist, avoid "reflexes" when they are not the result of a "drill" (e.g. check flow in the cockpit followed by reassurance with the checklist), and suppress the gut feeling.
In the military peacetime realm: decide with the mainstream and folllow the "King" when you want to be successfull in the long-term. Acquire knowledge, be courageous, take time for analysis but synthesize and decide contextually informed (versus contextually driven) when you want to move things forward.

There is no golden rule. I consider the criteria mentioned above but every choice is an individual one depending on the subject.

strategic thinking and the same advice for a friend: analyze the situation, take proper action and stick to the plan

First of all: make decisions. communicate them with those affected by them. be transparent.

Stick to the numbers and let them help you guide towards your recommendation and decision making

The more serious the issue at hand, slowing down. Ideally, sleep one night.

Guidelines and Experience, Calm atmosphere

See above

Die Erkenntnis, dass Entscheidungen gefällt werden müssen! Falsche Entscheidungen können manchmal besser sein als keine Entscheidung zu fällen!

Follow your dreams, but then be consistent and committed. Get advice if you are unsurr, but then make your own decision once eveything has been carefully considered.

a fast decision is better then no decision

first describe the current situation, weigh up all the options and stick to your decision

act according to medical standards and keep the special situation of the patient in mind to adjust accordingly to his needs

Not to decide immediately, if it is not necessary. A good decision needs time. Better to have some minutes time to think about

Think through possible consequences and have a plan B if things go sideways

Use more brains Nd give them as much time as possible

Don't be hasty. Make sure the information you are depending on to make a decision is accurate and relevant to the particular case.

Cooperation,constsnt learning

take on a strategic, long-term perspective that supports investing in one's own personal future

Talk to everybody with knowledge and take your time. If you cannot take your time, accept that some decisions won't be optimal. Not really one golden rule, I know.

Have patience

First think, then act

Gather all the relevant information, develop a plan together with your team for the best possible outcome, get all stakeholders on board with a clear logical explanation of the possible scenarios and why the selected decision would achieve the best possible outcome.

get as much information as possible beforehand

I think you should also listen to your gut feeling at work, but I would still advise you to talk to your colleagues if you need advice.

Thorough preparation and information gathering before deciding

Know your field. Analyse your Problem. Decide Major Pros and Cons. As soon as you aware of the riscs and benefits make a decison and stick to it unless Situation dictates otherwise

Follow the guidelines

SWOT Analysis

Das wird schon irgendwie

Take your time

Do not be shy, speak up if you think it's necessary.

To have trust in me.

Sleep.over it, be authentic, dont be afraid to make mistakes.

Thank you very much for your participation!

You can leave a note here, if you wish to.

23 Antworten

9.3 Appendix C – Sample for the QR-code invitation to participate