



What Makes Controllers (more) successful?

It's all about behavior!

Dream Car of the "Ideenwerkstatt" at the ICV

With experiences and examples from companies



In cooperation with



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Management Summary

The purpose of management accounting and controlling (hereafter: controlling) is to help support the decision-making process and guide the behavior of management. Controlling services, however, do not necessarily result in the intended behavior of management; staff in controlling (hereafter: controllers) are only successful if they use their tools and information "properly".

One of the most important findings in this context is the theory of **bounded rationality**. Due to limited cognitive capacities to process data and the generally complex environmental conditions surrounding decision-making situations, people are unable to take absolutely rational decisions; this contradicts one of the premises suggested by *Homo oeconomicus*, the analysis tool of traditional business administration. Indeed, rationally optimal decisions are not the objective underlying decision-making, as people rather search for alternatives which satisfy a certain level of aspiration or performance.

As a result of the limitations of the individual to act, having diverse perspectives in decision-making becomes even more important. The different mindsets, perspectives, solution strategies or work styles of people, summarized in the term **cognitive diversity**, are an important resource for companies. Cooperation between managers and controllers with different mindsets, in particular, can result in more efficient and effective strategy and decision-making processes and thus lead to considerable benefits for companies. However, it is necessary to consider the risks of diversity and counteract their consequences.

One concrete impact of bounded rationality on the decision-making behavior of the individual is the use of strategies of simplification, known as **heuristics**. These allow us to create simplified images of what were originally complex, unstructured problems. However, the use of heuristics leads to cognitive distortions, or *biases*. These can be seen as actions which deviate from the normative ideal of rational decisions.

Biases occur in all phases of controlling processes and influence the behavior of managers and controllers alike. Controllers need to be aware of this. Despite a broad consensus in the scientific world about the existence of **cognitive biases**, only isolated ways of resolving them are available to date. Creating an awareness that the problem exists among those affected is, however, the first step to solving the problem.

Although there is a broad consensus on the use of heuristics to reduce complexity, people see its influence on the quality of decisions differently. Based on the assumption that people do not look for optimal solutions but rather satisfactory ones, **fast and frugal heuristics** represent an efficient alternative method of decision-making. Fast and frugal heuristics are specialist decision-making strategies which use the evolutionary skills of people in specific situations to achieve efficient solutions. The core element of this problem-solving strategy is to consciously ignore less relevant information, which results in reduced complexity. What is particularly important here is that strategy, human abilities and environment all fit together. This is called ecological rationality.

0 Preface

The aim of the “Ideenwerkstatt” (Dream Factory) of the **International Controller Association ICV** is to systematically observe the field of controlling and recognize major trends. From this, the „Ideenwerkstatt“ develops the “dream cars” of the ICV, thereby making a major contribution to ensuring the ICV is seen the leading voice in the financial and controller community. Ideas and findings are transformed into concrete, working products in ICV work groups or other project groups. Members of the „Ideenwerkstatt“ are renowned representatives of the field of controlling from the corporate world and academia.

During 2010 and at the beginning of 2011, the „Ideenwerkstatt“ concentrated its work on the issue of **green controlling** as a response from controllers to the growing ecological orientation of controlling.

The trigger for choosing the theme in 2011 and 2012 came from the finding that the work of the controller often does not lead to the desired **behavior effects** among recipients of controlling services, namely managers. Approaches from psychology can provide explanations and solutions here.

As early as 1974, in his manual for the controller *Albrecht Deyhle* (cf. *Deyhle & Radinger 2008*, p. 136ff. *Controller Handbuch*) described what is necessary if you wish to be a successful controller. It is not enough to merely state the facts according to commercial logic; you need to take “**psycho-logic**” into consideration. Managers and controllers do not only communicate on a factual level. There is a second level of communication, one which – we might say – takes place under the table (see Figure 1). Accordingly, instead of talking about a dialog, we should see this as a “quadrilog”.

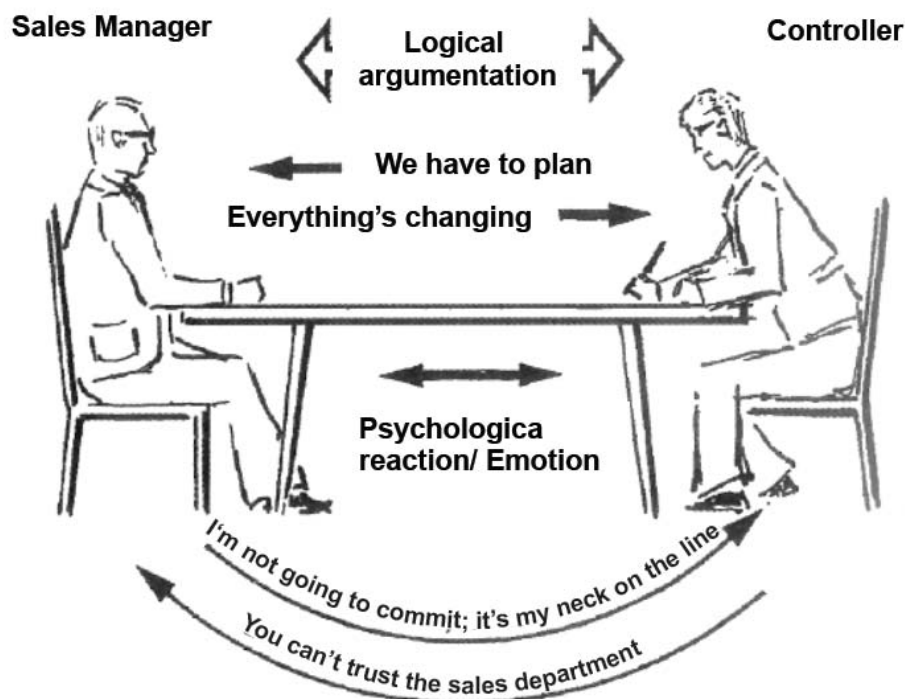


Figure 1: *Psycho-logic and logic above and below the table* (first Deyhle 1974, currently Deyhle & Radinger 2008, p. 701)

Controllers are experts in business logic. Unfortunately, however, their understanding of “psycho-logic” remains lacking. Accordingly, the Dream Factor sees the key to success in considering and applying a code of conduct in controlling processes.

Controllers can be successful when their support is used to successfully manage the company. There are two requirements for this to happen:

- Controllers have to use the “proper” tools and information.
- Controllers have to use their tools and information “properly”.

At this point, the „Ideenwerkstatt“ will focus on the second of the two requirements as we have repeatedly observed in the real world that while controllers have the right tools and information at their disposal, they do not get through properly to the “customer”, namely the decision-maker. There are three interlinked aspects to this:

- 1) We make mistakes in the interaction between manager and controller, i.e. we pay too little attention to the differences in responsibility for decisions and information.
- 2) We do not know how managers and controllers tick, i.e. about their decision-making behavior.
- 3) By the same token, we do not make our information “palatable”, i.e. information preparation is weak.

In all three aspects we are talking about behavior – for both controllers and managers.

Our basic hypothesis is that controllers can be successful if they have the right tools in their toolbox and if they formulate their information and messages in a language their customers understand.

Hence, the goal of this Dream Car Report is threefold:

- We want to identify the behavior that leads to successful interaction between decision-makers and controllers.
- We want to show the essential aspects of information preparation and provision for controllers.
- We want to collate the most important findings on real-world decision-making behavior by managers and derive a code of conduct for controllers.

This Dream Car Report is broken down into five chapters. As an introduction, we would like to show you the principles and importance of behavior, together with the approaches to **behavioral controlling**. We shall also show how the understanding of rationality and decision-making behavior has changed over time. In the second chapter we will present the advantages and disadvantages of differences between controllers and managers in the sense of **diversity**. The third and fourth chapters deal with different forms of decision-making behavior, where we will analyze the role of intuition. The fifth chapter will summarize the findings in the form of recommendations for the cooperation between controllers and managers.

The theoretical findings will be complemented throughout by real-world experiences which we were able to gain through expert interviews with managers and controllers from the following companies:

- Deutsche Lufthansa AG
- Hansgrohe SE
- MAN Truck & Bus Österreich AG
- SKF Österreich AG
- TRUMPF Werkzeugmaschinen GmbH
- voestalpine Stahl GmbH

We would like to take this opportunity to thank the interview partners once again for their willingness to support the work of the „Ideenwerkstatt“ of the International Controller Association ICV with their real-world experience.

The members of the core team of the „Ideenwerkstatt“ are:

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What makes controllers (more) successful? | It's all about behavior!

We hope you enjoy reading this report and that you gain new impetus for your daily work in controlling.

Best wishes,



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1 Introduction: It's all about behavior!

Controlling is a sub-function of management which mainly consists of the interaction between controllers and managers. The function of the controller is to **support the decision-making process and guide the behavior** of the manager. Traditional decision-based controlling concepts assume that providing the manager with all the necessary information related to the decision and having the appropriate methods and tools is sufficient to ensure the manager takes the right decisions to foster the company's goals. **Behavioral orientation**, on the other hand, takes motivational characteristics ("want-to-do" deficits) and cognitive limitations ("can-do" deficits) of the manager and the controller into consideration when supporting decision-making and guiding behavior.

"Want-to-do" deficits are deviations of the individual goals of a manager or a controller from the goals of the company. These have been and still are today at the heart of research and practice, for example as part of the *principle agent theory*. Additionally, processes of information preparation and cognitive limitations cause "can-do" deficits among managers and controllers (see Figure 2).

In recent years, a focus on "can-do" deficits especially has led to a stronger behavioral orientation in controlling. Alongside questions of how to design controlling tools, it is their impact on the behavior of people which has come to the fore of scientific research. In this context, behavior comprises the cooperation between managers and controllers and the decision-making behavior of both. The way in which decisions are made differs depending on what the decision-making parties **understand by rationality**.

Supporting decision-making and guiding behavior

"Want-to-do" and "can-do" deficits in the development of controlling

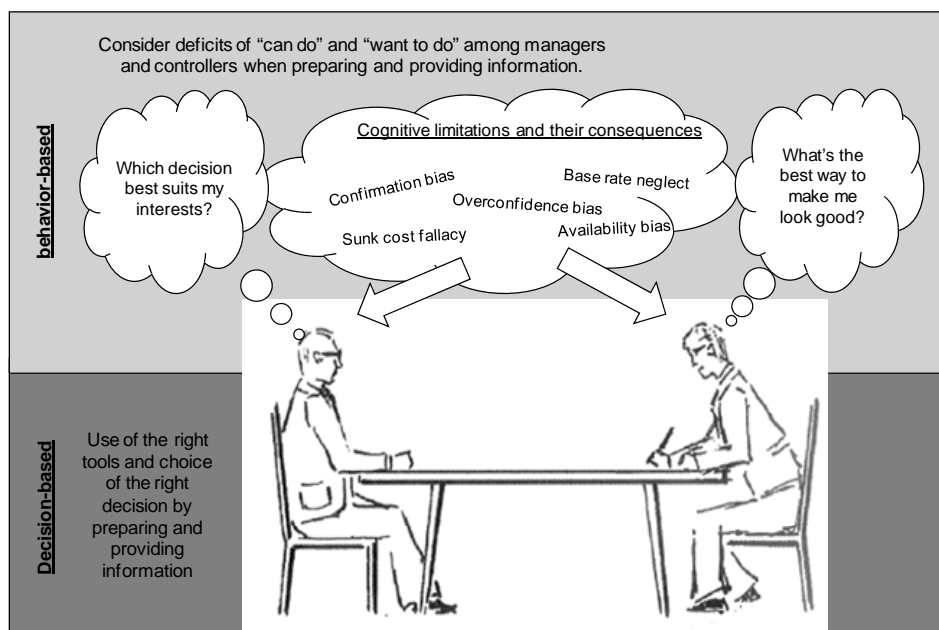


Figure 2: *Decision-based and behavior-based functions of controlling (based on Deyhle & Radinger 2008).*

In the economic sense, we see **rationality**, as the pursuit of long-term corporate success and the use of available means in an optimum resource-benefit ratio. Traditionally, the decision-based approach assumes that people enjoy unbounded rationality. This is also one basic assumption of traditional business studies, which uses the model of **Homo oeconomicus** to investigate behavior. **Rational behavior** means that people know the

Homo oeconomicus – he who acts rationally

benefits of all options and always calculate which is the best decision. Accordingly, the controller only needs to supply the manager with all the relevant information to ensure he can make the optimum decision.

Unbounded reality	Bounded reality	Rationality distortions	Fast and frugal heuristics
<ul style="list-style-type: none"> ■ People always act optimally in the sense of maximizing their own benefit ■ Decisions are made based on complete information and under consideration of all consequences 	<ul style="list-style-type: none"> ■ The capacity of the human brain to process data is limited; the environment is unsafe and complex ■ People do not look for optimum solutions but satisfactory ones ("satisficing") 	<ul style="list-style-type: none"> ■ A reduction in complexity is achieved by using unconscious cognitive heuristics ■ This leads to „biases“; these are deviations from the norm of rational decisions. 	<ul style="list-style-type: none"> ■ Fast and frugal heuristics are simple strategies to solve problems by ignoring information ■ Their use lead to decisions with little effort but satisfactory solutions

Figure 3: Dimensions of rationality and associated models of decision-making behavior

As early as the 1950s, *Herbert A. Simon* (1955, 1956 and 1959) – who would later go on to win a Nobel Prize – was the first to proffer the hypothesis that people are unable to take absolutely rational decisions. The reasons he gave for this were limited capacities of the human brain to process data and the complex, unsafe future. Both prevent knowledge or all options and their respective benefits. *Simon* introduced the term **bounded rationality** to describe this phenomenon. One consequence of bounded rationality is the basic inability of people to take optimum decisions based on rational aspects. According to *Simon*, as a result people do not look for optimum solutions but satisfactory ones which reach a certain level of aspiration or performance. He described this decision-making behavior as *satisficing*.¹ As soon as an alternative satisfies one's own level of aspiration or performance or that of the company, it is chosen and the search for alternatives is stopped, even if better alternatives might still be possible.

Daniel Kahneman and *Amos Tversky* picked up on this idea of **bounded rationality**. In the 1970s, the researchers provided empirical findings on how people's decisions deviate from the ideals of *Homo oeconomicus*. In their now famous essay "*Judgment under Uncertainty: Heuristics and Biases*" *Tversky & Kahneman* (1974) held the view that people use cognitive heuristics or **availability heuristics**. These describe the phenomenon that decisions are taken based on information which is currently available. People buy a particular type of coffee because they know it or because they have seen it on television.

The use of **cognitive heuristics** reduces the complexity of the environment and compensates for people's limited cognitive capacity. One possible consequence of strategies of simplification is, however, **cognitive distortion** (known as *bias*) in people's decision-making behavior; deviations from the normative ideal of rational decisions. This arises because decisions cannot be made based on knowledge of all options and their benefits. Or do you know all the types of coffee in the supermarket, can rank their tastes precisely and assess them in monetary terms?

Heuristics to reduce complexity cause deviations from the ideal of rational decisions

¹ The word *satisficing* is an amalgamation by *Simon* of the words *satisfying* and *suffice*.

The only German Nobel Prize winner for economics to date, *Reinhard Selten*, points out that sub-optimum decisions are a major element of the concept of bounded rationality. A decision which deviates from the rational ideal is not an exception but the rule (cf. *Selten* 2001). The ABC Group around *Gerd Gigerenzer* and the staff at the Berlin Max Planck Institute for Human Research have been developing a model for human decision-making behavior since the end of the 90s. This model considers both cognitive restrictions and the human desire for “satisficing” (cf. *Gigerenzer et al.* 1999).

By describing, developing and carrying out scientific research into **fast and frugal heuristics**, the research group has dispelled a prejudice which is equally widespread in both academia and industry: Simple problems can be solved with mere intuition and vague rules of thumb, while complex problems and important decisions require more effort and this increased effort (e.g. in time, energy and staff numbers) leads to correspondingly better results.

Staff at the MPI in Berlin believe quite the opposite, namely that **fast and frugal heuristics** – simple problem-solving and decision-making strategies which ignore information – often require little effort and lead to good or even better results. Choosing a recognized type of coffee based on brand recognition is not seen as a deviation or mistake. In the eyes of the researchers at the MPI, the principle of choosing the product you know is a successful strategy to make a successful and efficient decision. The goal of decision-making is not to find the optimum solution to a problem (using a lot of time and money to discover the absolutely best type of coffee) but to use *Simon's* concept of **satisficing** to find a satisfactory solution (a good cup of coffee now).

Fast and frugal heuristics facilitate efficient and satisfactory solutions

The behavior-based perspective has shifted the focus of controlling to people and their behavior. This consists of the cooperation between manager and controller and the behavior of both. This Dream Car Report of the „Ideenwerkstatt“ broaches both components.

Summary

The following chapter takes a general look at the different mindsets of people and a specific look at the different roles of managers and controllers. Further, it will show the benefits cognitive heterogeneity offers.

*The question of how managers and controller reach decisions is answered differently based on how rationality is understood. The analysis model of *Homo oeconomicus* has become increasingly harshly criticized in recent decades. The hypothesis of unbounded rationality of human decision-making has been replaced with the assumption of bounded rationality. In Chapter 3, we ask the question of what, given the assumption of bounded rationality, the controller needs to take into consideration. In Chapter 4, we show the conditions under which simpler forms of decision-making lead to more satisfactory solutions than analytical methods.*

Finally, in the Chapter 5 we will use the findings gathered to provide recommendations on successful, behavioral controlling.

2 Recognizing and Utilizing Diversity Between Controllers and Managers

2.1 Diversity: Having an eye for the differences

Diversity describes the variety and differences of and between people. Increasingly, diversity and diversity management are not only a part of political and public discussion and initiatives; more and more companies are taking a constructive look at the diversity of their employees. This refers not only to aspects of equality and equity, but also to concrete economic returns. How we view diversity has shifted from an approach to fairness to a resource perspective which wants to actively utilize the benefits of difference.

Here, we must differentiate between **demographic and cognitive diversity**. Demographic diversity describes all recognizable differences; in general, those dimensions anchored in equal opportunities laws: ethnic origin, gender, religion and ideology, handicap, age, and sexual identity. **Cognitive diversity**, on the other hand, is seen as the differences in mindsets and how we process information. These are influenced, for example, by educational background, years spent in the company, and functional position of a person. Accordingly, when it comes to the question of how the differences between managers and controllers can be utilized, the focus should rather lie on the diversity of mindsets, on cognitive diversity.

Page defines diversity in four categories (cf. *Page* 2008, p. 7): Differences in perception perspectives and interpretations of what is perceived, as well as problem-solving strategies used and forecasting models. According to these criteria, groups with a heterogeneous makeup have broader access to knowledge and are able to generate a wide range of very different solutions.

**Cognitive diversity:
Utilizing the
advantages of
different
perspectives**

2.2 Diversity in management: Resource or risk?

Managers act in decision-making situations on the basis of their personal interpretations which, in turn, depend on their experiences, values and personalities (Upper Echelon Theory: *Hambrick & Mason* 1984). This means that, first, individual motives and background must also be taken into consideration in order to understand how companies act. Second, we must assume that heterogeneity and the extent of **diverse perspectives** among managers – the cognitive diversity in top management teams (TMT) – have an influence upon company success.

However, having too much diversity can also have a negative impact as it can lead to growing barriers to communication and cooperation, as well as **conflicts** resulting from stereotyping and social categorization. Yet, not all types of conflict are undesirable (cf. *Gebert* 2004):

- *Value conflict:*

Within a group there are different goals and values which hinder cooperation. This type of conflict undermines cognitive diversity and should be avoided.

- *Relationship conflict:*

There is emotional tension between different persons which has a negative impact upon cooperation. This type of conflict is also counterproductive.

**Changing your
perspective to
improve company
success**

- Task conflict:

The group has concerns about the right way to achieve a (common) goal. Discussion here can give rise to new ideas and solutions. This type of conflict is desired and should be fostered insofar as it is handled constructively.

On the one hand, diversity in management can be an important resource for companies which leads to a greater pool of knowledge and an improved ability to absorb and process information. On the other hand, diversity is also a risk which leads to social categorization, greater barriers to communication and increased potential for conflict. If diversity is to become a success factor, a company must master these opposing forces.

2.3 Diversity as important resource for the controller to support the manager

As already described, individuals differ in their mindsets. Managers and controllers differ further in their roles within the company. The manager is, above all, responsible for developing and maintaining positive social relationships; for recording, searching, receiving and passing on information to members of the organization and to external parties; for making decisions; for searching for possibilities for innovation and change and for introducing them; for troubleshooting; for allocating resources; and for negotiating contracts (cf. *Mintzberg 1973*).

The **role of the controller** can be broken down into three aspects: first, managerial support with classical planning, information, monitoring and consulting duties; second, a critical counterpart role or constructive sparring partner for the manager; and third, co-management on equal terms with the manager. It can also be said that the role of the controller is shifting increasingly from mere provision of information to a growing involvement in information processing and tighter inclusion in strategy processes; in other words, the controller is increasingly seen as a partner of the manager (cf. *Weber & Vait 2008*).

In the spirit of diversity, however, the goal cannot be that at the end the controller takes on all the roles to the same degree. Far more, cooperation between differing people in different roles should lead to an enhancement of the variety of perspectives, which, in turn, means that the efficiency and effectiveness of the results of management decisions can be improved.

2.4 The benefits of diversity for the work of the controller

The diversity of management staff is a key driver of innovation for companies. Yet, other characteristics of the management team are important for its success. *Rigby et al. (2009)* identified the following attributes:

- Recognition of strengths and weaknesses: Team members are able to realistically assess what they are good at and where they need help.
- Expansion of cognitive capabilities: Team members search for those who complement their own work styles and decision-making processes.
- Trust: Team members trust one another.
- Unbiased views: Team members observe and assess the decisions of the team insightfully and truthfully.
- Relevant knowledge: Team members have the necessary experience for their duties.

The role of the manager and the controller in interactions

The interplay of analytical and creative mindsets

- Strong communications: Team members speak often and directly with one another.
- Motivation: Team members feel responsible for and obligated to company success and the team.

From the perspective of diversity research, it is above all the second point which is interesting. This says that cognitive capabilities, i.e. work styles, mindsets and approaches, of team members should complement one another.

Rigby et al. (2009) refer to teams with **analytical and creative members**. Often, however, (strategic) innovation processes involve people whose dominant mindset is an analytical one. Only few companies have explicitly creative people in top management positions. The authors see key to success in the cooperation between analytical and creative people in management whose mindset complement one another and thus make them successful. Figure 4 shows typical different mindsets of analytical and creative people and examples of how to put together successful management teams.

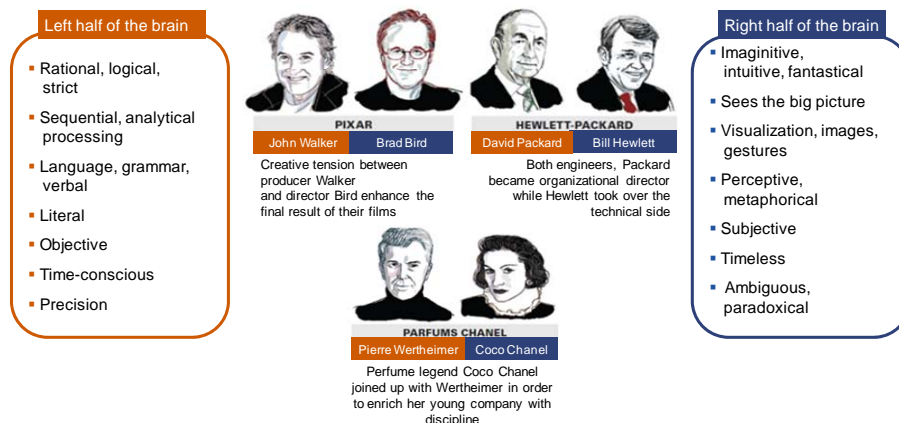


Figure 4: Examples of successful composition of management teams (based on Rigby et al. 2009).

Analytical and creative mindsets is only one possibility of differentiating between staff. Others can be found in literature, for example the *Enneagram of Personality* or the ways of thinking according to Max Lüscher (cf. Rohr & Ebert 2010 or Lüscher 2005).

If controllers are more heavily involved in the **strategy and decision-making processes**, this has a positive impact upon a company's success (Zoni & Merchant 2007). Including the controller and his analytical mindset can increase the effectiveness of the strategy process. At the same time, controllers act as neutral appraisers and can help formulate fair and measurable goals and improve the integration of strategy formulation and implementation. More effective strategy processes can raise company success as they enable companies to take better and more thought-out decisions. Here, however, how well controllers and managers work together is an especially decisive factor (Weber & Vait 2008).

A Look at the Real World

The benefit of diversity is closely linked with the intensity of the cooperation between manager and controller. Close cooperation makes it possible to derive positive effects from the different mindsets. The type of cooperation, however, can vary greatly between the individual tiers of management.

Low levels of communication in lower management tiers

On the lower hierarchy levels, for example at the level of senior production manager in a sub-division, there is often no communication between manager and controller with the exception of the monthly report. The controller is regarded as a mere provider of figures which, together with further prepared information, help the manager to make his decisions. The choice of and responsibility for decisions at lower management levels mainly reside with the manager alone. In this environment, interaction between controller and manager is problematic if competences and spheres are not clearly delineated.

Managers complained that controllers took diverging opinions directly to the higher-ups. Controllers took on the role of co-manager but not as a consultant to the actual decision-maker. Instead, the controllers took it on their own heads to talk to the next higher instance and to inform that person of apparent "incorrect decisions" or "wrong opinions" by the manager. Instead of having a rewarding cooperation and gaining a positive benefit from the diversity, diversity conflicts and mistrust arose between the "business partners".

Top management strives to utilize controller perspectives

The situation documented at higher and the highest tiers of management was different. Here, managers expressed the explicit wish for controllers who discuss equally with the management, who appreciate and seek out open communication and who take joint responsibility for decisions. The controller should be able, in consultation with the manager, to run the business or operations as the manager's delegate. This, however, assumes that the controller is fully aware of the business activities of the company and its competitive and market environment, including macro-economic aspects. Literally, the controller should be able to hear the grass growing. Here, problems can be caused if the controller lacks the necessary skills as he cannot fall back on his core abilities of controlling. What is needed are co-managers who represent the controlling perspective and not cost accountants who have no idea about the business activities of the company and its overall situation.

Differences in risk assessment

One concrete advantage of a diversified management team named by the interview partners was the differences between controllers and managers when it comes to assessing risks and the willingness to take risks. The controller was said to have somewhat of a conservative attitude to risk and controller was portrayed as having a lower willingness to take risks than the manager. This helps to stem and relativize over-optimism when it comes to judging business or project developments. What it does, however, require is that the controller does not limit himself to ensuring security or avoiding risk. Risks are an element of every company; he who does not take risks cannot benefit from opportunities. In the ideal world, risks should be evaluated, reasonably assessed from different perspectives and subsequently managed and monitored appropriately. Accordingly, the decision to take risks is taken by team consensus, with the team also sharing the responsibility.



Summary

The focus of society, politics and the economy is shifting increasingly to diversity. Most of the time, little distinction is made between demographic and cognitive diversity. Above all, cognitive elements can, however, create benefits for companies by utilizing different mindsets and problem-solving strategies of members of work groups. In order to ensure success, value and relationship conflicts among the cooperating parties must be avoided. Due to their distinct focus on the financial perspective, controllers can be a beneficial counterpart to the manager, especially when the managers like to rely on their intuition and experience. Above all, however, it is important that the cooperation is based on clear rules and a high degree of trust and cooperation.

Based upon the afore-mentioned findings, the first three recommendations in Chapter 5 will show you how you can improve the benefits of cognitive diversity in your company and what aspects you need to pay attention to when doing so.

3 Considering Behavioral Aspects in Controlling Processes

3.1 Cognitive distortions due to the use of heuristics to reduce complexity

The consequence of bounded rationality is the unconscious use of strategies of simplification, known as **heuristics**. We use these and our own experiences to create a simplified, structured and solvable mental image of an unstructured and complex problem. A decision made in this way can deviate from a rational decision as it means we do not necessarily choose the optimum alternative with the maximum benefit. This is due to **decision anomalies**.

There are numerous examples of the use of heuristics in empirical research. *Dobelli* (2011) shows this clearly using the decision between two games of chance: In the first game you can win €10 million, in the second €10,000. If you win in the first game, this changes your life: You give up your job and immediately live off the interest. If, however, you win the jackpot in the second game, you only give yourself a nice holiday. The chances of winning the first game are 1:100,000,000, while those of winning the second game are 1:10,000. Which game would you choose to play?

When it comes to deciding between the games of chance, our emotions make us to tend towards the first game, even though the second game is objectively ten times better. The effect whereby we focus on the winnings but ignore the chances of winning is called "*neglect of probability*" and leads to wrong decisions.

One example of cognitive bias is **availability bias**. This describes the phenomenon where decisions are made based on available information or information which is easily accessible. When appraising management performance, supervisory boards rely on information which has been provided by, of all people, the managers they are assessing. Finance managers use the Black-Scholes formula to calculate the price of derivatives, despite the fact that its validity was refuted ten years ago. *Dobelli* (2011) compares these examples with using the wrong city map as opposed to not using one at all.

The American behavioral economist *Dan Ariely* (2008) makes it clear that the described examples of irrationality in human behavior are neither random nor meaningless; in fact, they are predictable. He sees the knowledge of when and how we deviate systematically from the normative ideal of rationality as the starting point for improving people's decision-making and for enhancing and modifying conventional economics with the help of findings from psychology.

3.2 Controlling, information supply and cognitive distortions

As a management process, controlling is the process of setting targets, planning and managing the performance of a company with the ultimate goal of sustainable profitability. As shown in Figure 5, this can be broken down into ten main processes. Here, we wish to focus more closely on the three highlighted processes. The aim is to show which **want-to-do and can-do deficits** of managers and controllers should be considered during these processes.

The objective of this chapter is to create an awareness for the reader of the extent to which people's own actions are determined by unconscious and partly also conscious interests and decision anomalies. There is a

The use of heuristics as a way of reducing complexity

Cognitive distortion (bias) resulting from the use of cognitive heuristics

consensus in science that people are subject to can-do and want-to-do deficits. However, research into controlling is still in its infancy when it comes to developing concrete behavioral solutions. Creating an awareness that the problem exists is the first step towards a comprehensive behavioral orientation.

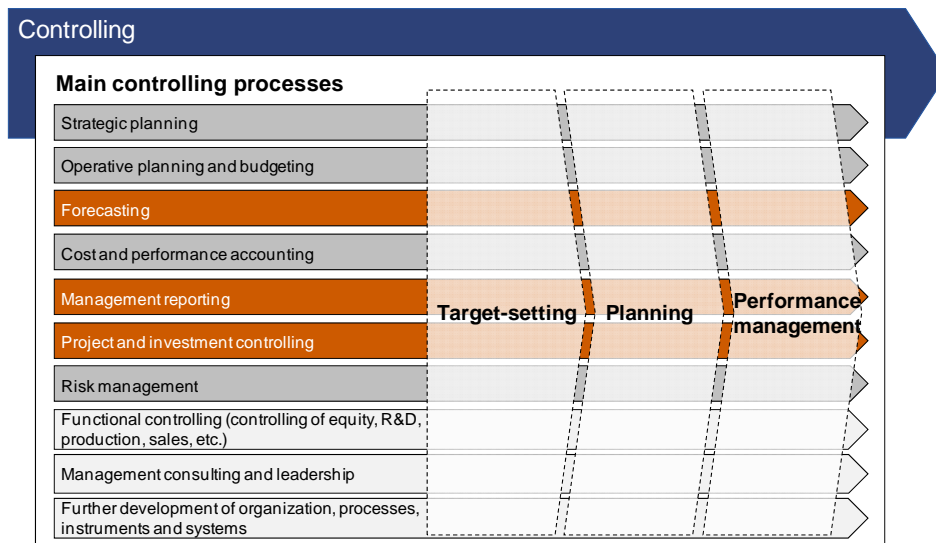


Figure 5: *Main controlling processes of the work group “Controlling process model of the International Group of Controlling (based on International Group of Controlling, 2011, p. 21).*

3.2.1 Management reporting

The goal of management reporting is to provide information relevant to decision-making for the performance-based management of a company. This comprises both the task of providing information to support decision-making and the task of documenting the actions of the different parties in the company. Both tasks raise transparency across the company.

For a long time, **behavioral orientation** in reporting was neglected. When it came to decision-based controlling concepts it was widely believed that by providing all the relevant corporate data, managers would be able to manage and steer their companies optimally. Most people never questioned how the report recipients would read or interpret and use the data for their decisions.

Being presented with a flood of information, largely without any relevance to concrete decision-making situations, leads to **information overload** for recipients. The larger the quantity of information, the more difficult it is to differentiate between information with management relevancy and information without. Both manager and controller run the risk of focusing on information with less relevancy for the decision. Additionally, if each recipient then has to filter the information individually again, this takes even more time (cf. *Volnhals & Hirsch 2008*).

In recent years, this insight has led to some turning their backs on the growing “data cemeteries” and instead tailoring individual reports to the specific needs of the recipient. However, human thoughts and actions are determined by further psychological and social influences which the controller must also consider when designing, generating and delivering reports.

Information overload makes recognizing relevant information more difficult

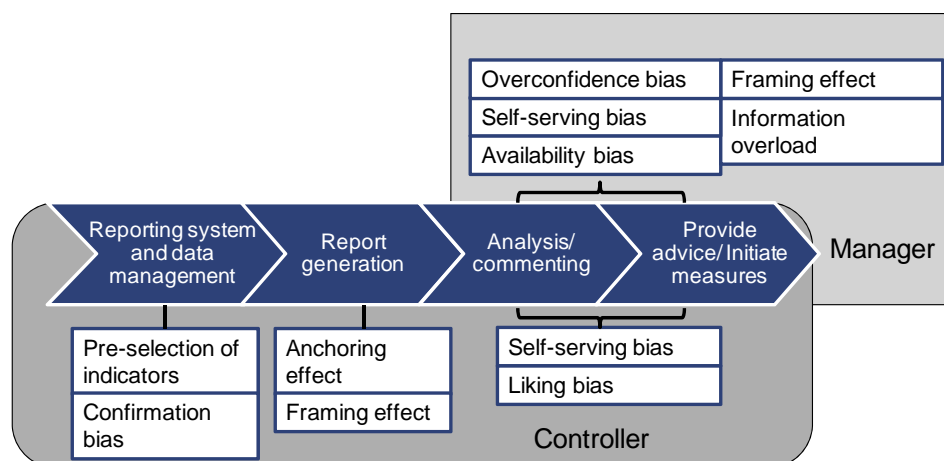


Figure 6: Management reporting and examples of cognitive (based on International Group of Controlling 2011, p. 34).

In **reporting systems and data management**, the performance indicators and analysis dimensions are defined and the IT architecture agreed upon. If the controller is too one-sided when pre-selecting performance indicators and ratios, this can lead to the manager suffering from the phenomenon of tunnel vision when assessing the as-is situation. Controllers run the risk of only considering those performance indicators which they believe are relevant for decisions or which support their (the controllers') views and opinions. This leads to confirmation bias. The controller must reconcile the information he offers with the manager's demand for information. This can only happen as part of a participative process between controller and manager.

Report generation means gathering, processing and aggregating data by the controller. The risks during report generation lie especially in the distortive use of starting points for predicting future developments (*anchoring effect*) or the non-consideration of important correlations and causes as a result of processing and aggregation (*framing effect*). During report generation, some of the biases which influence the work of the manager in subsequent phases are determined.

Analysis and comments serve to validate the report and elaborate upon the causes of deviations. This phase is crucially linked with the discussion and selection of possible **measures** to counter possible undesirable developments. In both phases biases occur which have their roots in report generation. How information is presented has a considerable influence on how matters are perceived (*frame effect*). There is a risk here that too much aggregation of data can lead to causal links being lost or that too great a focus on specific aspects can mean data is falsely seen as being particularly relevant.

If decisions must be taken, managers are often satisfied with available information (*availability bias*) without requesting further evaluations or detailed analyses. The preferred use of information is to support the manager's own convictions, which is a further problem (*confirmation bias*). Information which refutes the manager's opinion is regarded as irrelevant and overlooked or ignored.

In both phases, managers and controllers are particularly subject to their own interests. Various incentives, both monetary and non-monetary (e.g. promotions), can influence the selection of measures. At the same time, we can also develop preferences for specific themes due to emotional attachment (*liking bias*) which cannot be explained rationally.

A Look at the Real World

In the world of business, the picture of management reporting differs across a company's hierarchy and its functions.

Reporting as personal communication at top management level

Controllers who report directly to top managers in a company mainly design their reports along the lines of "less is more". It goes without saying that they provide a comments section on the report to the management board. Generally, reporting takes place as part of monthly management meetings where the controller reports to other functional or departmental heads on the economic situation of the company. As a rule, not all topics are discussed; instead, the controller selects what he sees as the relevant problems. The causes are then analyzed together and counter-measures are approved. The direct communication by the controller with the other members of the management board is absolutely vital at top management level.

The advantage of management reporting as a form of personal communication between senior managers can be seen in particular in the different cognitive perspectives mentioned in Chapter 2.2. Different ways of perceiving a problem and approaches to finding a solution contribute to prevention in contrast to the mentioned cognitive biases of the individual (especially self-interest, liking bias, confirmation bias or availability bias).

No personal reporting at lower management levels

It is often not possible to discuss departmental or field developments in detail in larger decision-making bodies at lower management levels. The reasons for this are the time needed and the frequency with which operative decisions must be made. However, it was also found that decisions on operative business activities were, as a rule, seen as less complex than strategic decisions affecting the general orientation of the company or division. The lower complexity is a result of the structuring effect of decisions higher up the hierarchical chain.

In production, for example, managers can receive all the information they need to ensure smooth operations from a few performance indicators about the aspects of adherence to deadlines, quality, costs and employees. The number of decision alternatives is also limited. If a production unit cannot reach the output level required by the sales department and there are no efficiency problems, the production head only has a few measures to choose from: order overtime, arrange extra shifts or employ new workers. This decision-making situation can easily be assessed using the information contained in the monthly or daily reports; complexity and uncertainty are low.

Manager complain about the retrospective nature of reporting

Not only across the tiers of hierarchy but also in the individual functions do differences exist in the form and use of reporting. Managers from sales units bemoaned that the monthly reports are only a "photograph of the past". Due to the volatility of the markets, such reports were not useful. What was required was assessments of future market developments and concrete recommendations on how to react to them. However, it was also admitted that sales-specific knowledge of the market situation was necessary to do this, knowledge that controllers did not usually possess. The consequence was that sales managers or their staff made their own "additional assessments" without controlling input. This indicates that in practice there is a problem of indicator pre-selection but that managers, perhaps unconsciously, protect themselves against availability bias or confirmation bias by carrying out their own in-depth analyses.

The management representatives who were interviewed all agreed that the monthly reports contained insufficient information on cause-and-effect relationships. Additionally, there are growing calls for comments and derived recommendations from controllers.



3.2.2 Investment and project controlling

The task of project and investment controlling is to actively support management in the planning of investments and projects and in the adherence to quality, time and cost targets during execution. Figure 7 shows the typical process steps and possible cognitive biases which might

occur. As the controller supports the manager in his tasks, in principle both could be affected by any decision anomalies which might occur.

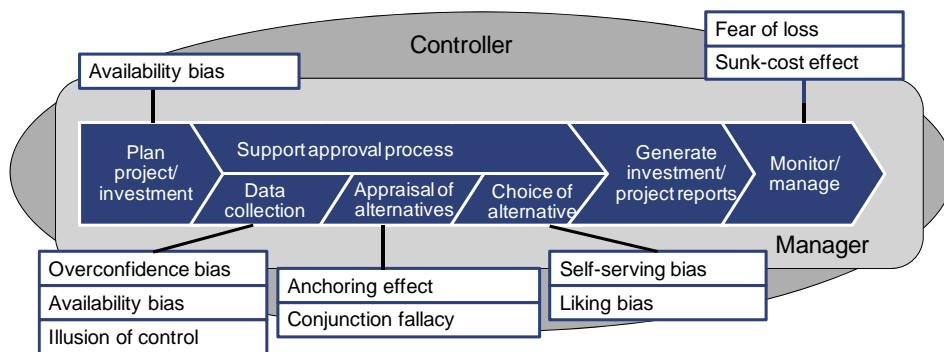


Figure 7: Investment and project controlling processes with possible biases (based on International Group of Controlling 2011, p. 37)

In the **project and investment planning** phase, support from the controller is mainly limited to profitability analyses. In particular, when it comes to idea generation it is desirable to have a further way of looking at things to consider (see Chapter 2). One risk here is to concentrate on project and investment alternatives which are known or were already successful in the past (*availability bias*).

Untapped potentials: Controller are more than just performance auditors

In the **data collection** phase, the project manager must be able to make the most reliable forecasts possible concerning the expected investment costs and revenues. Additionally, the times of the payment flows and their associated risks must be assessed. As a rule, the environment around the company is complex, which results in prognoses providing an inadequate reflection of the real future.

Can-do deficits also affect how people act. Overconfidence of one's own abilities (*overconfidence bias*) leads to very optimistic prognoses of cost and revenue streams and time forecasts. Due to the mere understanding of connections, the illusion of control suggests a possibility to influence the situation to the manager even though objectively this does not exist. He then mistakenly believes his actions can have a positive impact upon developments.

Overestimation of one's own abilities and how to influence it

The **appraisal of alternatives** creates the basis for the subsequent **choice of alternative**. Theoretically, the alternative which promises the highest capital value and hence the highest increase in company value should be chosen. Evaluations, however, are always based on estimations of expected payment streams, including associated value and quantity developments. This complexity results in the use of simplification strategies (heuristics) and cognitive biases.

People often base their estimates unconsciously on an "anchor" or point of orientation. The current production costs and any change to the previous period, for example, are used to forecast production costs for the upcoming period. Possible future costs are explored from this starting point and this is done mainly without considering any possible changes to the environment or external factors. Numerous studies have proven empirically that estimations vary depending on the type and level of the anchor used (*anchoring effect*).

Assessments are distorted by the choice of "anchor"

Report comments and detailed descriptions result in two events, for example a rise in the price of kerosene and a fall in the demand for aviation services, being unconsciously placed in context with one another, despite them being completely independent. Accordingly, the possibility of both

events occurring is seen as more probable than only one of them happening, although the latter is statistically more likely (cf. Chapter 3.2.3). The basic probabilities are ignored (*conjunction fallacy*).

The **choice of alternative** should result in the project best suited to the company's goals being chosen. Here, decisions are influenced by the self-interest of the parties and their personal preferences for a specific aspect (*liking bias*). This can also lead to the appraisal being repeated recursively with modified assumptions until the preferred project appears desirable.

Continuous project and investment reporting, together with **monitoring** of the extent to which targets are met, is required throughout project execution. Should deviations arise, the reaction should be to initiate target-based counter-measures or even to abort the project. Managers who have decided upon a specific project, however, tend to continue the project for as long as possible regardless of the likelihood of success. This should make their decisions appear consistent and show that costs already incurred "were not in vain" (sunk-cost effect). The loss or abortion of a project weighs much more heavily upon a manager's feelings than the possibility of a new and (more) promising project (*fear of loss*).

A difficult decision: Aborting a project

A Look at the Real World

Neglecting to consider the controlling perspective in idea generation

In the world of business, the search for good project and investment ideas mainly takes place in decentralized specialist departments and great trust is placed upon them to find the "right" project. Controlling has no advisory function in questions concerning idea generation or technical feasibility. The controller's role in the investment process is concentrated upon ensuring profitability. The potential which an outsider's perspective might bring to idea generation remains largely untapped.

Standardized profitability analyses create comparability

In order to ensure alternatives are comparable, profitability analyses are carried out based on structured requirements. In operative areas, above all, profitability plays an important role in selecting the best alternative. Strategic decisions are taken based on additional factors, such as social acceptability or securing long-term competitiveness.

The challenge of objective project appraisal

In practice, the influence of biases can be seen in the phase when alternatives are analyzed and appraised in particular. The overconfidence and liking biases overshadow the objectivity of project managers when it comes to the presentation of project alternatives. In the case of technically oriented projects, project managers in the specialist departments develop an emotional tie to the projects as a result of the affinity for technology. This leads to overly optimistic estimations concerning project potentials.

Decision-making bodies as a means of spreading responsibility

Setting up a decision-making body consisting of representatives of different departments and engaging in critical discussion of the opportunities and risks of a project are widespread measures of objective project appraisal in the business world. As decision-making is shared, the burden of responsibility is transferred to all involved. This is seen as a preventative measure to counter the sunk-cost effect. It makes the decision to abort a project at a later date easier. However, projects are not terminated at the first sign things are going wrong. A typical, real-world statement on this is, "If you change your decision at the slightest hiccup, you would be a poor manager". Those responsible for projects first try to pull all the levers and make every possible adjustment before questioning the sense behind a project started or an investment made.

An example of this is the investment in company premises in a previously untapped market. The investment would not be scrapped after just one year based on serious undesirable developments, which might perhaps be reasonable step. Instead, the company would try to develop a new strategy or to adapt the products to better suit the conditions of the markets. If, after several years, these measures show no signs of



improving the situation, then the manager responsible will try to gradually pull out of the market with the intention of protecting his own reputation.

Structure project control by means of milestones

Companies try to combat this phenomenon by defining milestones. If, for example, a project has not reached a certain, pre-defined level of progress at a specific point in time, the project manager has to explain in detail where the causes for the delay lie and how the time can be made up. Often, approval for further project or investment budgets is tied to specific milestones being reached.

3.2.3 Forecasting

The early recognition of expected deviations is a prerequisite for being able to develop specific measures for closing target gaps to initiate rapid adjustments in turnover, cost and investment budgets when conditions are changing. The forecasting process is more than a simple prognosis – it is an act of planning. Figure 8 shows biases which can influence the actions of managers and controllers during forecasting.

**Forecasting:
An act of planning**

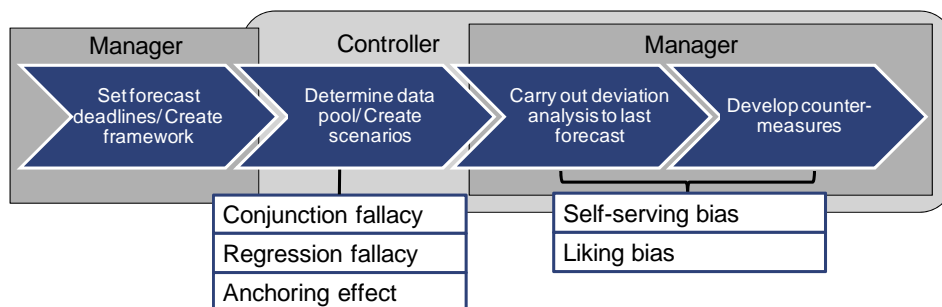


Figure 8: Forecast process with possible biases (based on International Group of Controlling 2011, p. 28)

The phase of **determining the data pool** requires, above all, analyses of scenarios and sensitivities. Scenario analyses grant a view of business developments under both the most likely conditions and better and worse conditions. In this way it is possible to calculate the maximum financial burden for a company under poor future developments. Sensitivity analyses, on the other hand, show the influence of external factors, e.g. energy prices, on how the company's bottom line develops. The benefits of using both instruments depends on the ability of those involved to estimate the probability of future events. This, in turn, is subject to cognitive biases.

**Analyzing scenarios
and sensitivities**

The *conjunction fallacy* describes the phenomenon that comments and detailed descriptions can lead to basic probabilities being ignored. *Tversky* and *Kahneman* (1983) showed this using the Linda Experiment. Linda is a woman who became involved in the fight against race discrimination and social injustice during her studies. Based on this portrayal, 85% of those questioned rated the probability that Linda is a bank employee and a feminist as being higher than her being a bank employee regardless of her political commitment.

Seen logically, the statement "Linda is a bank employee" is more probable as this comprises both the statement "Linda is a bank employee and a feminist" and the statement "Linda is a bank employee and not a feminist". The basis for this illogicality is that based on the description, the statement "Linda is a bank employee" is implicitly understood as "Linda is a bank employee and not a feminist". This way of describing situations has a significant influence upon how probabilities are estimated.

**Probabilities based
on false
assumptions**

People's performance is subject to fluctuations and we look for reasons for these peaks and troughs. The success of a project, or the lack of it, is often linked to subjectively important boundary conditions without proof they actually have any impact whatsoever. Failures are attributed to external factors, such as cooperation with colleagues. Successes are explained as resulting from one's own abilities: "The business was only successful because I called the customer up personally." The differing emotional attribution of success and failure leads to spurious correlations between results and boundary conditions. These boundary conditions are then used unconsciously when forecasting future developments in order to estimate the chances of success (*regression fallacy*).

The starting point or "anchor" for a forecast also has an unconscious influence (*anchoring effect*). The origin of the initial values used to derive scenarios must be analyzed (external comparative values, internal experience values or other sources). False anchors can have a negative influence upon the decision-making process and lead to false conclusions.

During the process steps of **analysis and counter-measures**, managers and controllers are subject to the biases already mentioned. These influence how they see themselves as part of the analysis of causes and the development of counter-measures (including *liking bias*, *self-serving bias*).

A Look at the Real World

The forecast has become a very important feature in many companies, at the latest since the introduction of the rolling planning and budgeting process. Planning and budgeting can only be as good as the prognoses of future business developments. The forecast for incoming orders, for example, has a major influence on which production capacities are planned and subsequently made available.

Naive methods of estimation more relevant to business practices than optimization techniques

In the world of business, people are slowly becoming aware that complex analytical instruments and statistic optimizations are often not the solution to the puzzle. Especially when it comes to very volatile estimates, for example the number of incoming orders for the next two to four weeks, companies are switching to naïve methods of estimation such as the average value for past periods. These are then adjusted to cater to experience and expert knowledge.

Assessing opportunities and risks using competitor and market data

Forecasts always form the basis for appraising investments or projects. In sales, historic controlling data plays a rather subordinate role, for example to assess the potentials of market entry. The main factor influencing the decision lies in observations of the market and competitors. One approach in practice is to expand the information base for actors by including macro-economic data such as economic figures. Additionally, efforts are underway to encourage controllers to also tackle the situation of market and competitors. It is only after looking at the market conditions that one is able to appraise opportunities and risks.

Managers and controllers are subject to many can-do deficits in decision-making situations. The unconscious use of simplification strategies which reduce complexity results in cognitive distortions, or biases, which in turn influence the decisions of managers and controllers in nearly all phases of the controlling process. We have shown this using the example of three selected processes.

In Chapter 5 we will use Recommendations 4 to 8 to give you some basic tips on how you can identify the influence of cognitive biases in the decision-making behavior of managers and controllers and how you can reduce their negative consequences.

Causal attributes lead to false predictions



Summary

Further information

The two models of decision-making described in Chapter 3 and Chapter 4 are not complementary. They contradict one another in certain areas: The use of *fast and frugal heuristics* leads to efficient and satisfactory solutions, and the use of heuristics leads to cognitive bias, respectively. This is due to differences in what is understood by the term "heuristics".

The „Ideenwerkstatt“ of the ICV has neither the skills nor the remit to decide which model is correct and which is false, if indeed this decision is even possible. It is our aim to show:

- which forms of cognitive bias can arise within controlling processes in the decision-making behavior of managers and controllers, and
- what *fast and frugal heuristics* are, in which situations these can lead to simple and efficient solutions, and what is necessary for *fast and frugal heuristics* to be applied in companies.

In the final chapter of this work we provide recommendations on what can be undertaken in order to minimize the impact of cognitive biases and how fast and frugal heuristics can be used in companies.

4 Developing and Utilizing Simple and Efficient Heuristics for Decision-Making

4.1 Confronting *Homo oeconomicus* with *Homo heuristicus*

The reflex of wanting to bring enormous resources to bear when we have to make a decision in an unsure and complex situation can be traced back to a general desire for optimization and it corresponds to the classical concept of *Homo oeconomicus*. According to this assumption, the man of “rational” actions functions like a computer which systematically processes large amounts of data and integrates it in such a way that the benefits resulting from a decision are maximized. The mathematical model of such a decision-making process is the multiple regression which weights and integrates all available data and dimensions according to importance.

Researchers from the Max Planck Institute for Human Development (MPI) in Berlin confront the *Homo oeconomicus* with the modern concept of man, the *Homo heuristicus* – a person who, when searching for efficient and effective solutions, often ignores information and also relies upon his or her intuition in unsure decision-making situations (Gigerenzer & Brighton, 2009). When choosing a restaurant or bar *Homo heuristicus* does so purely on the basis of one characteristic which he feels is particularly important. Here is an example: If many happy guests are sitting in one restaurant while another is completely empty, our intuition tells us there must be a good reason for the preference of the many. We would tend to choose the more highly frequented restaurant.

Instead of having one generally applicable method for every problem imaginable, *Homo heuristicus* has an arsenal (**adaptive toolset**) of specialized strategies which he or she can choose from depending on the concrete circumstances of a problem. The decisive assumption is that optimization in the real world of limited resources and bounded rationality is not only impossible but also often not even desirable. Despite low efforts required, *fast and frugal heuristics* provides good results, sometimes actually better ones.

4.2 Which fast and frugal heuristics do we use?

The difference between optimization and the use of *fast and frugal heuristics* can be shown using examples. Imagine you had to decide which of the two cities had more inhabitants:

Detroit or **Milwaukee**

To answer this question, *Homo oeconomicus* would gather all the available knowledge about both cities (e.g. are these state capitals, do they have large industrial areas, etc.), weight the facts according to importance and then choose the alternative with the highest total value. If you asked a group of people in Germany this question, the overwhelming majority (about 90%) of them would quickly choose the right answer: Detroit. Interestingly, this majority is in fact greater than if you asked a group of Americans the same question as only about 60% of them would choose Detroit.

Does it follow that Germans know more about American cities than Americans do? Of course not. As a rule, Germans possess only vague information about both cities. They choose Detroit because they recognize the name of the city, while they have never heard of Milwaukee. This fact is made possible through the use of **recognition heuristics** (Goldstein & Gigerenzer, 2002): If you recognize precisely one of two objects, then it follows that this has the higher value for a specific criterion (e.g. number of

Homo heuristicus* as alternative concept to *Homo oeconomicus

The adaptive toolset

Trust in the power of recognition

inhabitants). Recognition heuristics finds many uses in our daily lives, for example when buying a car. If price and accessories were the same, which car would you prefer: a Lexus or a Mercedes Benz? Despite the apparent naivety of **recognition heuristics**, it is possible to use it to put together profitable investment portfolios or to successfully predict the winners of elections and tennis tournaments – and the advertising budgets of many firms allows us to guess that marketing experts are fully aware of the underlying mechanisms.

If you know both alternatives and indeed you have rapid access to a lot of knowledge about the alternatives, you don't necessarily always have to take this knowledge into account. Which city has more inhabitants:

Stuttgart or **Berlin**

You could probably access many details about both cities. Indeed, it can be seen that some of them (e.g. airports, universities, and sports clubs) have a positive correlation with the higher number of inhabitants. Yet most people would correctly choose Berlin simply by asking themselves, "Is one of the cities the capital?" One type of *fast and frugal heuristics*, which come to a decision based on one single reason, is **take-the-best** heuristics (Gigerenzer & Goldstein, 1996): If possible decision-making criteria are listed according to relevance, it is not necessary to go through the whole list of possible criteria. **Take-the-best** considers the relevant criteria in order and ends the search as soon as there is a difference in one single criteria. Investment decisions often use multi-faceted criteria to assess alternatives. However, the final decision between alternatives, or possibly a shortlist of alternatives, is often taken based on one single criterion: The decisive criterion for buying a new machine could be whether the company strives to pursue sustainable corporate management, whether the fuel used is gas as opposed to oil, or which has the lowest fuel consumption.

One convincing criterion is better than lots of mediocrity

4.3 When are fast and frugal heuristics successful?

Naturally, there is no guarantee of correct answers or "good" decisions with *fast and frugal heuristics*. A restaurant may appear more popular, for example, because a tour group has just stopped off there. If we had asked the question before 1990 whether

Stuttgart or **Bonn**

had more inhabitants, a decision based purely upon the status of Bonn as capita would have led to the wrong choice. In order to test the validity of *fast and frugal heuristics* under realistic conditions, researchers at the MPI in Berlin compared their forecasts for numerous problems (e.g. concerning salaries, house prices, homeless numbers and school drop-outs, court decisions, etc.) with the predictions of statistical optimization techniques (Czerlinski et al., 1999). The findings showed time and again that *fast and frugal heuristics* required little effort and did without using all the information available and still they provided results which were as good if not actually better than apparent optimization techniques. Analyses of the conditions under which these initially astounding results occurred revealed two key elements: the robustness of simple forecasting models and the need for a fit between a fit between strategy, human abilities and the environmental structures.

Robustness and fit of abilities, strategy and environment

Simple rules often provide more **robust predictions** because they avoid using requisite flexibility to adjust for what are merely random data patterns. The expected temperature pattern for next year, for example, can be predicted equally well, if not better, using a simple model with few measurements (e.g. the temperature at the beginning of each month) than by using a complex model with several measurements per day.

The fit between selected strategy, evolved human abilities² and specific environmental structures is called **ecological rationality** (see Figure 9). Recognition heuristics uses our evolved ability of a highly developed recognition memory and relies upon relevant objects also appearing more often in our environment (e.g. they are mentioned more often in the media). Take-the-best heuristics is based on the human ability to prioritize relevant criteria and uses existing redundancies in our environment to reach good decisions based on little information.

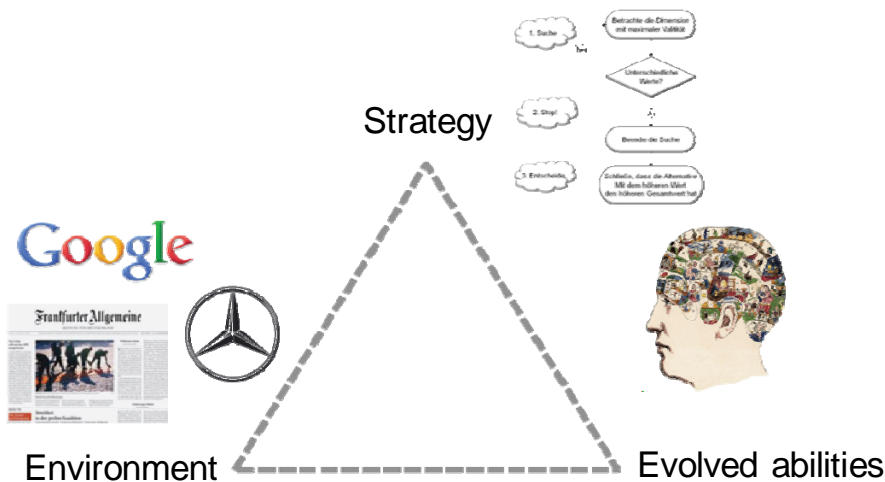


Figure 9: *Ecological rationality: A question of the fit between strategy, environment and evolved abilities (Gigerenzer et al. 1999).*

4.4 Fast and frugal heuristics in real decision-making situations

As real decision-making environments are usually incomparably more complex than the city comparisons given above, a legitimate question is whether fast and frugal heuristics also stand the test of real decision-making situations and the world of business. An impressive example for this from the field of financial investments is so-called **1/N heuristics**. These spread all the available capital equally across all the number N of possible investments or investment types. Extensive studies based on historical share price data have shown that the yield from such an apparently naive diversification strategy is very hard to beat, even by complex optimization techniques (DeMiguel, Garlappi, & Uppal, 2009). Harry Markowitz himself, winner of the Nobel Prize and father of the portfolio theory, which forms the basis for nearly all optimization techniques, actually set up his own retirement provisions using 1/N heuristics.

Noble Prize winners also use fast and frugal heuristics

In literature we can find another example of the practical use of fast and frugal heuristics in companies. Hiatus heuristics are used to assess whether a customer is still an active buyer of the products of a company or if it will no longer buy them in the future. Complex mathematical models, such as the Pareto/NBD or the BG/NBD models, exist to answer this question. Wübben and von Wangenheim (2008), for example, were able to show that the hiatus heuristic, "The customer will buy no products in the future if he has not bought any of our products in the last six (nine, twelve) months" provides the same and sometimes better results than mathematical optimization models.

² We understand evolved abilities as those which humans have learned during the course of evolution.

Sequential decision-making rules and decision trees offer one possibility for finding a satisfactory solution by successively closing in on the solution (Green & Mehr 1997). An example of a successful decision tree is used to diagnose heart attacks. The method is shown in Figure 10.

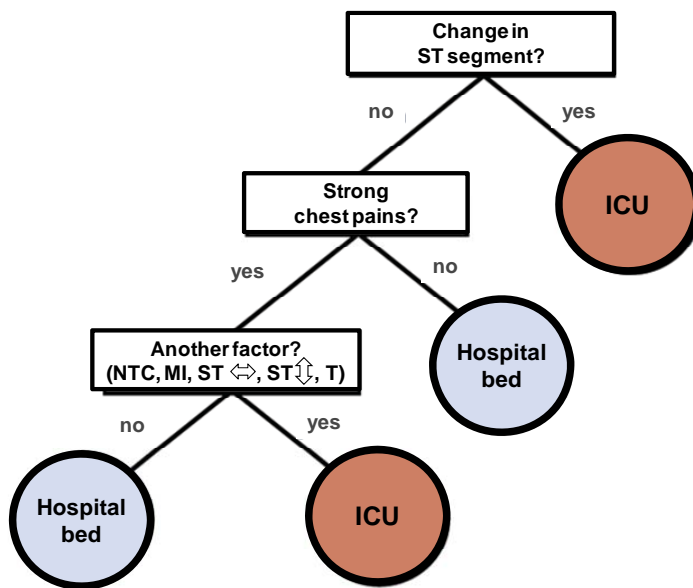


Figure 10: Approach used in heart attack heuristics (based on Green & Mehr 1997).

If the ECG of a patient with a suspected heart attack shows a change in the ST segment, this indicates the possibility of a heart attack and the patient is transferred to the intensive care unit (ICU). If there is no change and the patient does not complain of chest pains, it is rather unlikely to be a heart attack and he will be kept on the ward for observation. If the patient does have chest pains, a third, differentiated criterion will be applied.

An empirical investigation showed that doctors who do not use this approach send about 90% of all patients with suspected heart attacks to the ICU. This defensive strategy leads to overcrowding, reduced quality of care and increased health risks for all IC patients. Green & Mehr (1997) were able to prove that using **heart-attack heuristics** leads to a greater number of correctly diagnosed heart attacks and significantly reduces false-positive diagnoses.

Sequential decision-making situations are special in that their alternatives are assessed in order and rejected alternatives are often no longer available at a later point in time (e.g. products, but also applicants, job offers or life partners). In situations where the search for further alternatives takes more effort (e.g. costs in terms of time and money), especially, *fast and frugal heuristics* based on a specified level of performance are often superior to more complex strategies. One possible heuristic for a sequential decision-making problem is **beat the first**. This chooses the alternative which beats the first-chosen alternative in terms of the decision criterion selected. Neth et al. (2011) proved in simulations on the choice of partners that very simple strategies lead to a good balance between choice of satisfactory alternative and costs for the decision.

The *fast and frugal heuristics* described here are already proving their use is also possible in the corporate world. In many decision-making situations they, or variations upon them, certainly influence unconsciously the decisions of controllers and managers. In order for *fast and frugal heuristics* to be beneficial, they need to be applied in defined situations according to

No company can conduct in-depth interviews with all candidates

clear rules. The choice of suitable situations and the supply of information needed for successful decisions must lie in the remit of the controller.

A Look at the Real World

Defensives decision-making as strategy of justification

It is difficult to prove that the *fast and frugal heuristics* described above are being used in the corporate world. While managers and controllers agree that simplification strategies are used for difficult and complex decisions, it is very difficult to describe them precisely. In many cases, the dominant phenomenon is one known as *defensive decision-making*. Here, decision-makers do not choose the best alternative (“What does my gut feeling tell me?”) but the alternative which is the easiest to assume responsibility for (“Based on the available information, what can I justify?”).

Concentration on the important parameters in a decision

Despite this, we were able to identify tendencies towards using *fast and frugal heuristics* in the interviews for this study. One of the tasks mentioned for controllers was choosing the “relevant levers” which are of particular importance for assessing a decision. This is a step in the direction of take-the-best heuristics. Not all criteria can be considered in complex, difficult situations, so instead controlling should prioritize criteria and make the decision based on the most important.

Indications of *fast and frugal heuristics* were also revealed in when it came to risk management. As we saw in Chapter 3, estimating the probability of uncertain events occurring is incredibly difficult and often our intuition plays tricks on us. It is almost impossible to estimate the risk of individual business decisions. Instead of focusing on the question “Which risks are associated with this business transaction?”, companies are concentrating on the question “What impact would the failure of this business transaction have upon overall profits?”. Afterwards, projects are not assessed based on their individual risk profile but on whether the risk portfolio of the company can sustain a further “risky” deal of that respective type. This sustainability is not given if the existence of the company is endangered when a series of projects in the portfolio fail.

Simple estimates are more effective than analytical optimization

Similar reports came from several interviewed companies concerning their incoming orders. The expected number of future orders is very important information for manufacturing companies in order to ensure they make sufficient but not too much capacity available for production. Instead of using complicated analyses of time series or exponential smoothing models, the number of orders expected for the coming weeks was estimated using simple mathematics based on average incoming orders for the past weeks. When bandwidths in production capacities made possible by flexible working hours were taken into consideration, these naïve estimates were sufficient in past years for planning production capacities. There were neither production stoppages due to under capacity nor unnecessary idle times as a result of under-utilization.

Decisions trees as the basis for systematizing the solution space

We were also able to observe the use of decision trees in business practice. In one company, a decision tree is used to decide whether to accept special orders. The first question here is whether the order is technical feasible or not. Afterwards, details of whether the department has the necessary know-how and the resources to complete the order in the required time. Only when these two hurdles have been overcome does the company deal with the question of whether the order is profitable or not.

Decision trees can help to reduce complexity by giving structure to a decision-making problem. Only one aspect of the potential solution space is dealt with on each level. Often it is not necessary to scrutinize each problem microscopically. If the order is not technically feasible, considerations on its profitability become obsolete. What can happen, however, is that decisions made at an earlier stage (“technically feasible”) must be revised (“find different technical solution”) due to later decisions (“not profitable”).



4.5 Intuitive design - A challenge for the controller

One general characteristic of *fast and frugal heuristics* is that potentially **useful information is ignored** as it does not alter a decision or improve it significantly. Although there are numerous indications that successful experts (e.g. sportspeople, managers or judges) regularly act successfully on the basis of *fast and frugal heuristics*, their use is not recommended for all decisions across the board.

There is no generally applicable answer to the question of whether *fast and frugal heuristics* are superior to analytical methods, or vice versa. Each situation must be looked at individually to see the conditions under which simple rules with low effort can lead to good results. It is not only possible to rectify possible defects in the fit between solution strategies used, human abilities and environment structures by changing the strategies. **Intuitive design** is a process of facilitating ecological rationality through the specific modification of strategies, the ongoing development of human abilities and the active shaping of the environment.

Defining rules for the use of *fast and frugal heuristics* should be a job for the controller. Here, it is necessary to analyze typical decision-making situations in the company. Decisions must be identified which cannot be taken optimally with the help of analytical methods and the costly use of resources but where a satisfactory, efficient solution is possible through the use of *fast and frugal heuristics*. Examples of this are the prediction of incoming orders for the coming weeks given above or an estimation of the future willingness of past customers to make further purchases.

Rules are important to ensure the use of fast and frugal heuristics does not lead to pure arbitrariness or self-serving decisions. It is particularly in the case of negative decisions that a company runs the risk that the decision-maker tries to escape responsibility by using intuition to explain away his actions. In order to prevent this problem arising, controllers must use **intuitive design** to create rules about how (human abilities) which *fast and frugal heuristics* (strategies) can be used in which situations (environment).

How *fast and frugal heuristics* can be found or developed for specific situations is the focus of current research efforts³. One possible, very promising approach is to analyze the methods used by people with many years of experience in corresponding problem-solving situations, especially when there is no optimal solution for the respective situation. For a practical example, please see the investigation by Seiter (2009) on the use of *heuristics* in the context of target agreements in management by objectives.

Homo heuristicus is the alternative concept to the classical term of rationality, which assumes the unrealistic maximization of a benefit function through the use of all available information. Homo heuristicus is adept at selecting strategies from an adaptive toolbox and can in good conscience also rely upon his intuition in uncertain decision-making situations. Research in the field of fast and frugal heuristics and numerous examples from the real world show that heuristics can achieve effective and efficient results with low levels of effort.

We have summarized the first approaches on how fast and frugal heuristics can support the work of managers and controllers based on the details given in this chapter in the recommendations 9, 10 and 11 in the next chapter.

The choice between fast and frugal heuristics and analytical methods depends on the specific situation

Job of the controller: Define situations and guidelines for using fast and frugal heuristics

Summary

³ The IPRI Institute, for example, is investigating possibilities for predicting the quantities of spare parts needed with the help of heuristic methods in the research project "HEUREGA".

5 Recommendations for Improving the Cooperation Between Controllers and Managers

As mentioned in the previous chapters, it is becoming clearer and clearer among controllers and managers that the issue of behavior is taking on an increasingly important role in the cooperation between controllers and managers. That cognitive biases arise is sufficiently well known in theory, yet measures to counter those biases in practice and in literature are to date few and far between.

In this final chapter, we would like to provide you with recommendations on how the cooperation between controllers and managers and the impact of the work of the controller can be improved. To do so, we will follow the structure of the chapters so far. The first three recommendations describe how cognitive diversity in the company can be used positively. Subsequently, we show how managers and controllers can be sensitized to cognitive biases in their decision-making behavior. Finally, there will be recommendations on possibilities and requirements for using the *fast and frugal heuristics* described in Chapter 4 in the world of corporate practice.

An introductory comment on the recommendations should serve to focus the controlling hierarchy in companies: Controllers of lower levels base their behavior, or at least they should do, on the next highest controlling level. Hence, the heads of controlling in a company must also pay attention to this philosophy in their own actions if a stronger behavioral orientation is desired. Only then can it be ensured that the controllers throughout the whole company will act accordingly. In order to live up to their role as model and leader, the highest controlling level should also ensure that the desired behavioral patterns are transferred to the company and that different departments or divisions within the company do not develop their own understandings of the functions and tasks of controllers.

Advice 1: Foster cognitive diversity

Differing cognitive perspectives represent a potential for innovation and success which can be utilized as a competitive resource. In order to tap into this potential, a company needs to successfully manage its diversity, beginning with the selection process for new employees. Above all, a distinct willingness to learn and team spirit are important selection criteria. Team spirit, in particular, fosters employee knowledge about the expertise of their colleagues which they can also tap into.

Promoting individual skills and competencies of employees by means of training and education courses also helps to empower top performers and deploy them successfully. Shared values, the assumption of responsibility and fair bonus systems can ensure employees' long-term loyalty to the company.

- Attractive workplaces, e.g. through
 - shared values,
 - early assumption of responsibility, and
 - fair bonus systems.
- Acceptance, appreciation and the fostering of differences in the company.
- Tapping and promotion of individual skills of employees, e.g. through
 - training and education courses,

Advice

1

Foster cognitive diversity

- trainee programs, and
- tandem and mentoring programs.

Advice 2: Avoid barriers to communication and cooperation

Diversity can create barriers to communication and cooperation which limit the extent to which diversity potentials can be tapped or prevent this entirely. What is needed to master this tense environment is intelligent diversity management which actively supports positive diversity effects while avoiding barriers such as conflicts.

In order to take advantage of the benefits of a workforce with diverse cognitive abilities while at the same time avoiding communication barriers, stereotyping and undesired conflicts, groups must have mutual trust, shared goals, joint and livable values, and frequent and direct communication based on understanding.

- Open communication structures in teams and in the organization,
- A corporate culture based on trust, and
- A strong awareness of diversity, e.g. through
 - training sessions and talks,
 - communication workshops, and
 - team-building measures.

Advice 3: Include controllers in the strategy and decision-making processes

Stronger inclusion of controllers in the strategy and decision-making processes can result in the company being better able to take advantage of the differences between managers and controllers. As shown in Chapter 2, integrating different perspectives in management teams gives rise to more efficient strategy and decision-making processes. *Zoni and Merchant (2007)* were able to show empirically that this has a positive impact upon the success of a company.

However, cooperation between manager and controller needs certain rules. It is not the goal of a stronger inclusion of the controller in the leadership tasks of the manager to create a second manager who can take on all the managers duties and thus render the first obsolete.

Our recommendations for successful cooperation between manager and controller are:

- Formation of teams with complementary work styles, mindsets and approaches,
- Stronger inclusion of controlling in strategy processes,
- Stronger involvement of controlling in decision-making processes,
- Distinct and clearly communicated expectations and definitions of the goals of top management,
- Regular communication to managers and controllers of their tasks and goals,
- Promotion of open, cooperative and unbiased communication based on understanding between managers and controllers, and
- Acceptance and appreciation of the different mindsets and roles of managers and controllers in the company.

Advice

2

Avoid barriers to communication and cooperation

Advice

3

Include controllers in the strategy and decision-making processes

Advice 4: Prepare information to suit the needs of the recipients

The way in which information is portrayed and described always has an influence on how it is perceived by its recipients. It is not possible to transfer information in a neutral fashion. Controllers must not only consider which information they provide to support decision-making but also how they provide it. Depending on how they are portrayed, facts can be seen from different angles and can lead to different decisions. Let us take the example of a decision on whether a project should be continued or aborted. Portraying the loss of the capital already invested has a specific influence on the decision; showing the cost savings of an early termination of the project as opposed to continuing it has a very different one. The controller needs to prepare the information in such a way that it makes the perspectives with the most relevance for the decision transparent.

In order to ensure that portraying the different perspectives does not lead to information overload for the manager, it is helpful to integrate him when designing the report. The type of portrayal – graphs, tables, figures – should meet the needs and the preferences of the recipient. Moreover, when controller and manager work together to design reports, this leads to the manager having a better understanding of the causal relationships in information. This fosters his ability to take on information and helps prevent daily information overload.

Advice

4

Prepare information
to suit the needs of
the recipients

Advice 5: Objectify motivation and personal interest

Decisions are also always influenced by the decision-maker's own interests and preferences. In addition, decision-makers or indeed people in general tend to suffer from the very human fault of overestimating their own abilities and skills. The consequences is alternatives which are rated and portrayed too optimistically.

Controllers must try verify and validate the estimates and assessments of managers by discussing them with the managers.

- "How did we get to these assumptions about future business developments, causal effects and finance streams?"
- Why is alternative A better than alternative B, or why is there no alternative B?"

Here, it is helpful to assume the perspective of your competitors.

- "Why is our company better than the competition?"
- "Why should succeed at doing what our competitors have not tried to do or failed at doing?"

This critical questioning of the assumptions leads to an objectification of problems and is particularly suited to exposing preferences based on emotional ties.

The standard economic answer to self-interest and employee motivations which contravene corporate goals is a remuneration system based mainly on financial aspects. Findings from psychological economics, however, give rise to concerns that extrinsic rewards can damage or destroy intrinsic motivation. Rewards can be counter-productive and lead to a situation where only easily observable and measurable tasks are completed (cf. *Osterloh* 2011, p. 932). Incentives always lead to a channeling of activities. If high output is rewarded, the quality of the activity will suffer. Remuneration systems should be considered carefully and address internal incentives

Advice

5

Objectify motivation
and personal interest

alongside external ones. People with a pronounced motive to achieve strive for success as a result of positive effects and increased competences. In order to activate the motive to achieve, the demands must be high yet still attainable and those affected must be able to see a certain degree of self-responsibility (cf. *Rheinberg* 2011, p. 929).

Advice 6: Shed light on alternative perspectives

Advice

6

Shed light on
alternative
perspectives

People apply simplifying heuristics increasingly in situations of greater complexity or where they lack specialist knowledge. Decisions are taken based on existing data (availability bias), explicit information is used which supports the decision made intuitively in advance (confirmation bias), or available points of orientation are used to forecast future events (anchoring effect).

Controllers can provide support for those with responsibility above all by structuring the decision problem. The WYSIATI assumption – what you see is all there is – applies to very few situations and needs to be countered. Check lists showing which information is particularly relevant for specific decision classifications can be useful. Asking the question which information would be needed if the decision had to be taken again in a year's time can lead to neglected information with decision relevance being “discovered” (cf. *Kahneman* et al. 2011, p. 52).

Alternatives are mainly assessed using performance indicators. An analysis of their origin – are these facts or are the figures based on estimates? – and a subsequent plausibility check of possible estimates can lead to greater objectivity of the assessment. If it is possible that anchors were used as an aid to orientation (e.g. the costs of a comparable project), then another anchor should be applied consciously and the estimation repeated. The aim is not to determine the objectively “right” costs but to view the assumptions from another angle.

Advice 7: Reduce fear of loss by sharing responsibility

Advice

7

Reduce fear of loss
by sharing
responsibility

People are afraid of failure. Accordingly, most people are unwilling to admit to having made the wrong decision. Aborting a project, however, is in general on a par with the admission of one or more wrong decisions. People responsible for projects are afraid of losing their reputation and see it as their abilities being questioned. For companies, though, in many cases it is more sensible to abort projects earlier rather than continuing them for months or years.

If the decision to carry out a project or an investment is taken by mutual agreement based on discussion in a decision-making body, this body should also assume responsibility for the decision. Should the project transpire to be less beneficial than originally thought, it is then easier to abort if the responsibility does not lie with one person. To ensure that abort decisions are not delayed through emotional or personal concerns of the decision-makers, decisions on the continuance of projects should not be taken by those directly involved but by committees or bodies higher up the hierarchy.

Measures which favor performance-based project management are (cf. *Mahlendorf* 2008, p. 204):

- The introduction of milestones which must be reached before subsequent project phases can be started,
- The definition of goals and abort criteria ex-ante before project launch,
- The definition of reporting standards to quantify project progress and costs still to be incurred, and
- The protection of the reputation of those responsible for the project if it is aborted.

Advice 8: Use the controller's knowledge of methods to assess risks

Advice

8

Use the controller's
knowledge of
methods to assess
risks

Most people have great difficulty in dealing with probabilities. Conditional probabilities and probabilities of events which are dependent on one another, in particular, cause problems.

In the last centuries, scientists have developed the calculus of probability, a tool which allows us to deal correctly with probabilities and risks. Controllers usually have the analytical capabilities and mathematical skills needed to use probability calculus. The difficulty lies in the proper communication of the results.

Human perception always depends on the personal characteristics of the recipient. People without an affinity for numbers and probabilities interpret the probabilities they are shown differently or see connections between events where there are none. *Gigerenzer* (2007, p. 103-108) was able to show that the Linda Problem discussed in chapter 3.2.3 has its roots in the way the question is phrased. If the question is modified, on average those questioned guessed that over 90% of the described people were bank employees.

As soon as probabilities form the basis for decisions, controllers must make it clear which cause-and-effect relationships exist between the different matters. They must show the impacts of the occurrence of one event upon the expectation that another will occur. Personal talks and shared discussions should create a joint understanding of the assessment of opportunities and risks.

Advice 9: Take intuition and know-how seriously

Advice

9

Take intuition and know-how seriously

Controllers have an extensive arsenal of methods at their disposal, some of them borrowed from other disciplines, from mathematically “simple” calculations like the TARGET-IS comparison and deviation analyses to highly complicated models and stochastic instruments such as the LEN model for analyzing *principal-agent* relationships.

Instruments used as aids to decision-making suggest a rational and understandable approach; after all, their use follows clearly defined mathematical and unambiguous rules. Every use of decision-making aids, however, also has subjective elements. Both the decision to use an instrument and the interpretation of the results and conclusions are influenced by subjective effects (cf. *Müller & Sauter* 2011, p. 38-39). The underlying assumptions and the fulfillment of requirements for using the instruments are also subject to subjective deliberations.

Decision aids are an inalienable element of the decision-making support for controllers and managers. Having said that, it pays to be a little bit skeptical when using them, especially when the conclusions arising from the use of those methods/ instruments contradict one’s own intuition and experience. Just because a decision can be justified based on the results of an applied methodology, this does not make it a criterion for the correctness of a decision or whether it makes sense. Blind trust in a method leads to individual experiences and subjective knowledge remaining unused.

Above all, we should not ignore our intuitions. There can be good reason why we get a “bad feeling” about a decision. Often, however, no further attention is paid to our gut feelings. After all, business processes should be transparent and comprehensible, which is apparently what generally accepted methods and instruments are. *Müller & Sauter* (2011) recommend we make the effort to discuss the experiences our intuitions are based on. In this way, intuitions can be explained and actions based upon them become more comprehensible, verifiable and transparent.

Advice 10: Prioritize decision-making criteria and concentrate on the essentials

Advice

10

Prioritize decision-making criteria and concentrate on the essentials

As already frequently mentioned in Chapters 3 and 4, the availability of more information does not necessarily lead to better decisions. A surfeit of information can possibly cause us to lose sight of really relevant details; this is known as information overload.

Controllers can help managers by making clear to them which of the parameters in a decision are really relevant. For each decision there is a great variety of criteria which, depending on the situation, can play roles of differing importance. If you rely on what in your eyes is the most important criterion, you can at least be sure you have made the best choice in terms of that aspect. If, however, you start to weight all criteria and use the weighting to come to a decision, you might find that the criterion with the highest relevance is compensated for by others, especially if we consider that the choice of weighting itself is a subjective estimation.

It is important that a decision made in this way does not lead to arbitrariness. Reasonable grounds must exist for the choice of each attribute. It is also conceivable that not only one but two or three criteria are considered, above all when there are a great many alternatives to choose

from. Here it makes sense to consider the use of decision trees, where one by one those alternatives are rejected which do not satisfy the minimum requirement of the first, second or third criteria, respectively.

Advice 11: Use decision trees and sequential decision-making rules

Advice

11

Use decision trees
and sequential
decision-making rules

Decision trees can be used flexibly in the business world. One example of this has already been presented in “A Look at the Real World” in Chapter 4. When deciding on whether to accept a customer order, the company first looks at technical feasibility. If this is given, questions on profitability come to the fore. By defining decision trees, controllers can structure the search for alternatives. This brings great clarity to the solution space and makes it easier to handle, thereby reducing complexity for the manager.

As they limit the number of potential alternative solutions, in the same way as sequential decision-making situations, decision trees help to optimize the consumption of resources necessary for decision-making. Rules for sequential decisions can be the maximum number of tenders to be requested for purchase decisions or abort criteria for the search for alternatives.

In this final chapter we have provided you with recommendations for the three topic areas discussed in the previous chapters. The first three recommendations should provide food for thought on how to take advantage of the potentials of cognitive diversity.

The main objective of the recommendations on cognitive biases is to sensitize managers and controllers to the decision-making anomalies and self-interest they are subject to in their actions. Merely creating an awareness of these biases is a first step towards reducing their impact.

Although applied research into fast and frugal heuristics is still in its infancy, the last three recommendations show which potentials lie in their use in the corporate world. Here, one should keep in mind that the rules for using fast and frugal heuristics can also contribute to improving and guiding their use, even when they are possibly being used unconsciously.

Summary

Appendix

A Overview of particularly relevant biases in the cooperation between managers and controllers

B Reading list for behavioral controlling

C Bibliography

A A Overview of particularly relevant biases in the cooperation between managers and controllers

Bias	Description	Relevance for controlling	Recommendations
Availability bias	Decisions are taken based on available or easily accessible data or explanations. There is no further analysis of data as a satisfactory decision can be made based on the available data.	A decision between different investment projects is guided by pre-selected data; employees of the decision-maker could try to make your preferred project appear better by supplying specific information.	Controller must provide relevant information and comment on it. They must also create an understanding of the importance of the information. Check lists showing which information is particularly relevant for specific decision types can help ensure that the most important information is used to reach a decision.
Halo effect	One aspect (mainly striking or readily obtainable) is used to draw conclusions for the big picture. There is no closer or further analysis. Everything is concentrated on the obvious.	Striking portrayal of information can result in other important information being seen as "less important", leading to wrong decisions.	Decision-makers should ensure at least one or two alternative solutions are prepared before a decision is made. Additionally, both the recommendation and the alternatives should be discussed in detail based on data and facts. Here it is important that the alternatives are not unrealistic and the facts and figures are scrutinized.
Confirmation bias	Information which opposes one's own decision is not considered. Only information which supports your decision is actively looked for and used for analysis.	The information which forms the basis for the decision reflects the preferences of the decision-maker. There is no active search for alternatives. Signs of failure are, for example, classified as special case and undermined.	

Bias	Description	Relevance for controlling	Recommendations
Incentives bias	False incentives tempt you to reach self-serving decisions and distort the targeted or intended result. Corporate goals take a back seat.	For example, project-based incentives are created which tempt the decision-maker to undertake a project regardless of all risks and/or alternatives even though there is no overall benefit for the company.	Set up incentives which are based on overall company success to help prevent self-serving decisions (e.g. equities or stock options).
Self-serving bias	Decisions are fundamentally shaped by self-interest	A preference for a decision/ alternative is always there, the question is only about the extent to which this impacts on the company.	Question critically the significance of the self-interest. Expand the decision-making bodies to reduce the burden of responsibility. Make explicit reference to risks in project reports to enhance sensitivity.
Reactance	If an option ceases to exist or becomes limited, it is seen as being more attractive.	Rational thought ceases when things become scarce. As a result, things are often not rated according to their price or benefits.	Have decisions taken by committee and use constructive discussions to help choose the best alternative.
Conjunction fallacy	The tendency to assume that specific conditions are more probable than general ones.	Comments and notes can have a significant influence on decisions and cause statistical probability of cause and effect to become blurred.	Sensitize those involved to adhering to basic probabilities before spontaneous conclusions are drawn.
Gambler's fallacy	Belief in the balancing power of fate. If black comes up three times in roulette, people assume that red is more likely to come up next.	If a decision has led to failure, then it is assumed that the next time the same decision will be right to balance things out.	Question decisions critically and analyze starting points as assumptions which are based on this effect have no basis in fact whatsoever.

Bias	Description	Relevance for controlling	Recommendations
Fear of loss	A loss weighs much more heavily upon one's emotions than a win. For this reason we tend to remain invested in a project for longer than would be objectively reasonable.	A loss weighs much more heavily upon one's emotions than a win. For this reason, managers can find it difficult to abort projects which are running badly and accept their losses. This gives rise to a false risk aversion. The lack of details from companies concerning their accepted levels of risk also foster this loss aversion.	<p>Demand precise details of the risk profile of the company.</p> <p>Spread responsibility for the decision across several decision-makers or groups.</p> <p>Include neutral/ independent decision-makers.</p> <p>Show initial losses in reports to ensure (mental) sensitization.</p>
Sunk-cost effect	Funds already invested are used to justify further investments.	Decisions are influenced by previously taken decisions and the costs associated with them. Further investments are made in loss-making ventures as a means of bolstering the chances of profit. Additionally, consistent behavior is seen as more positive than changing one's mind at a later date.	<p>Introduce milestones.</p> <p>Shift decision-making power to a higher body if targets are not reached.</p> <p>Involve neutral decision-makers.</p>
Liking bias	The more sympathy your counterpart projects, the more people will prefer his alternative and the more irrational decisions will become.	A positive tendency/ atmosphere is reflected in the decision. Benefits are stressed and disadvantages neglected. In this way, possible better alternatives can remain ignored.	Have decisions taken by committee and use constructive discussions to help choose the best alternative.

Bias	Description	Relevance for controlling	Recommendations
Overconfidence bias	This is when one overrates their own knowledge. The overconfidence bias measures the difference between actual knowledge and assumed knowledge.	The misconception of controllers and/ or managers to make better decisions than other based upon what they feel is better knowledge. This can lead to arrogance and false assessments, e.g. of forecasts for degree of target achievement, costs targets or also to false estimates of time.	Be generally skeptical towards estimates and prognoses. Acquire an awareness for overestimated data. Carry out plausibility discussions and critically question matters – play the devil’s advocate.
Illusion of control	The illusion of control leads one to believe he has control over something when in fact he has no objective power over it.	Simply knowing the underlying connections is usually enough to suggest optimism and the associated illusion of control to a manager. This leads to the overconfidence described above and its consequences.	Use comparable projects as benchmarks. Include the opinions of neutral observers. Introduce feedback rounds including an analysis of success factors.
Outcome bias	The tendency to judge a decision by its eventual outcome instead of based on the quality of the decision at the time it was made.	Assessment of performance is based on performance indicators and their interpretation and not based on prevalent decision premises (company success not due to decisions but to good market development).	Assess performance not only on the basis of performance goals but also on prevalent work ethics.

Bias	Description	Relevance for controlling	Recommendations
Information overload	The ability of involved parties to absorb information is overloaded – information is filtered and leads to false conclusions.	When information overload occurs, we use the information which we are most familiar with or which is the easiest to understand. For example, managers then concentrate on reporting content which they understand and neglect aspects which they do not understand but which might be important.	<p>Controllers must make decisions to select which information is communicated when and how (tables, graphs, KPI systems).</p> <p>The decision-maker should be included in the processes of selection and information preparation in order to raise transparency.</p>
Selection paradox	More choice stands for more progress, but only up to a certain point. Beyond that we have information overload and paralysis sets in.	Research can, for example, result in extensive data which is meaningful but too cluttered to serve as the basis for a decision.	Controllers must reduce complexity in decision-making and present the manager with a tailored selection of data.
Anchoring effect	In estimates/ reports, false anchors are set (starting points or baselines) which influence the results.	The more uncertain or undeterminable a value is, the more we try to find a starting point (anchor) from which to derive an estimate. This effect plays an important role, for example, when we use capital value calculations from last year as the basis for assessing decision alternatives. If, as a result of this effect, we pay too little attention to changing conditions, we run the risk of misjudging the situation.	<p>Controllers/managers must critically question the data to create sensitivity concerning data procurement: Exactly where do the figures come from? Which are facts and which are estimates? Were benchmarks used or comparable issues?</p> <p>Controllers/ managers must also use other and/or additional models, benchmarks or new analysis methods for guidance.</p>
Framing effect	How things are portrayed and discussed influences how we make our decisions.	Methods of portrayal such as highlighting, tables, graphs and free text can be positive, e.g. reduce complexity or have a signaling effect. They can also be negative and lead to a loss of cause-effect relationships or to information overload.	Controllers need to discuss methods with the decision-maker to create transparency and an understanding of the information.

B Reading list for behavioral controlling

Publication	Description
* Ariely, D.: <i>Predictably Irrational, Revised Intl: The Hidden Forces That Shape Our Decisions</i>	<i>Ariely</i> uses concrete examples to show the irrational behavior of people and how they can be influenced, and uses this to derive recommendations.
* Ariely, D.: <i>The Upside of Irrationality: The Unexpected Benefits of Defying Logic at Work and at Home</i>	This book investigates irrational behavior in working and private lives and comes to the conclusion that instinctive decisions are often better than rational ones.
* Dobelli, R.: <i>Klarer Denken</i>	The world has changed radically but the human brain has not, and this often leads to systematic errors in thinking. <i>Dobelli</i> documents this clearly using examples from daily life.
* Gigerenzer, G.: <i>Gut Feelings: The Intelligence of the Unconscious</i>	The book deals with intuitive intelligence which often leads to quick and good decisions. <i>Gigerenzer</i> , as co-founder of the theory of <i>fast and frugal heuristics</i> , provides a comprehensible introduction to the topic.
Gigerenzer, G., Todd, P. M. & the ABC Group: <i>Simple heuristics that make us smart</i>	The scientific counterpart to the previously described book " <i>Bauchentscheidungen</i> ". Here, a large number of essays provide a description of the theoretical principles involved.
Gilovich, T., Griffin, D., Kahneman, D.: <i>Heuristics and biases - The psychology of intuitive judgement</i>	This collection of essays is an excellent summary of the research program "Heuristics and Biases".
Hirsch, B.: <i>Controlling und Entscheidungen</i>	Examples of explanatory contributions to behavioral accounting research and further behavioral sciences are explained.
Kahneman, D.: <i>Thinking, Fast and Slow</i>	The latest work by the Nobel Prize winner for Economics deals with different human thought models: fast, impulsive decisions rife based on intuition and emotions are compared with decisions which tend to be more complex, deliberative and logical.
Kahneman, D., Lovallo, D., Sibony, O.: <i>The Big Idea - Before you make that big decision ...</i>	This article is a practical guide to identifying biases and to possibilities for minimizing their impact.

* These publications are particularly suitable for an introduction to the field.

Publication	Description
Kahneman, D., Tversky, A.: <i>Prospect theory: An analysis of decision under risk</i>	This article criticizes the expected utility theory as clear model for decision-making in the face of risk. The prospect theory is presented as alternative model; this states that people rate losses emotionally higher than they do wins.
Mahlendorf, M. D.: <i>Eskalation des Commitments bei scheiternden Projekten</i>	This dissertation analyzes the causes of delayed project abortion and provides recommendations on how to improve project control.
* Meyer, M., Weber, J.: <i>Controlling und begrenzte kognitive Fähigkeiten</i>	Cognitive and motivational rationality bottlenecks are analyzed and concrete applications shown for such a behavioral approach to controlling in the fields of investment, information provision and value-based reporting.
Mintzberg, H.: <i>Managers Not MBAs: A Hard Look at the Soft Practice of Managing and Management Development</i>	The book is deals critically with training managers to MBA-level while considering the demands upon managers in companies.
Page, S. E.: <i>The difference: How the power of diversity creates better groups, firms, schools, and societies</i>	The book shows the characteristics and benefits of cognitive diversity. It details why groups can achieve better results than single decision-makers.
Simon, H. A.: <i>A Behavioral Model of Rational Choice</i>	Traditional economic theories are based on rational actions in a stable system. <i>Simon</i> shows that this assumption does not reflect reality and develops the model of bounded rationality.
Simon, H. A.: <i>Rational Choice and the structure of the environment</i>	The structure of the corporate environment is analyzed and it is shown that under these conditions it is not possible to make normatively rational decisions.
* Thaler, R., Sunstein, C., Nudge - <i>Wie man kluge Entscheidungen anstößt</i>	Nudge is the formula for getting others to make the right decisions. It is necessary as people are not capable of rational action.
Tversky, A., Kahneman, D., <i>Judgment under uncertainty: Heuristics and biases</i>	This famous article from 1974 looks for the first time at the use of judgmental heuristics and the resulting perception biases of people's decisions.
Weber, J., Hirsch, B., Linder, S., Zayer, R.: <i>Verhaltensorientiertes Controlling - Der Mensch im Mittelpunkt</i>	The 34 th volume of the series "Advanced Controlling" shifts the focus of controlling onto people and their behavior. The goal is to sensitize practitioners to the existence of this new field of behavioral controlling.

* These publications are particularly suitable for an introduction to the field.

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