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Process management

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CONTENT

1 PREFACE

The world is currently undergoing significant changes related to the revaluation of ways of thinking, management and understanding of essential context. The time, in which we find ourselves, is marked as transitional and for which is, at an increasing rate, characteristic completely different way of management. The motto of our society are continual changes and associated uncertainties. Changes of such nature that it is virtually impossible to carry out any long-term predictions (it is talked about a period of discontinuity or turbulent period). Discontinuity (turbulence, chaos or turning dynamics of external development of companies) complicates management [13,14,20].

Currently many companies worldwide within the system of management use the principles of functional management, which originates from hierarchal arrangement of organization with emphasis on the definition of superiority and inferiority. The basis for the application of this concept is the hierarchical organization and application of principles based on the division of labor. Those principles were deeper elaborated within the framework of classical management and perfected by H. Ford's application of assembly-line production [11].

Nowadays this concept does not guarantee success to companies because of the aforementioned dramatic changes to the business environment. Those changes are closely related to, among other things, the changing demands of customers. They expect non-compensatory product, i.e. one that meets all the required parameters at once and at the same time provides sufficient added value for which customers are willing to pay. Another aspect is a global competition that is able to deliver the described product to the market [61].

For the reasons above, changes are happening in the basic paradigms of management in terms of implementation of the new direction, which is the process management. The intent of these changes is to increase the flexibility of companies in relation to the ability to adapt to changing conditions. The essence of process management is application of integration of activities in the management of companies. If compared to functional management (adopted division of labor), there is an opposite process, namely the unification of individual operations into business processes, which are managed by procedural teams and directed by their owners. The main criterion for measuring the performance of each process

is the created value for a customer [66]. Within process management, in addition to things described above, there also is considerable emphasis on human capital, use of the corporate vision, cultivation of enterprise culture, teamwork and development of information, knowledge and the ability of continuous learning [62].

2 PROCESS MANAGEMENT

Historical development of enterprise management systems themselves can be simply expressed as the transition from functional management to the procedural management whose origin is assigned to the 1990's, although some signs are already apparent in earlier stages of development of thought-based management trends.

The essence of process management is the focus on streamlining processes, which are more or less specific for each company. Process management represents the systematic identification, visualization, measurement, evaluation and continuous improvement of business processes using the methods and principles, which are based on the procedural approach [68]. Processes can be defined as interrelated sub-activities that transform in their sequence inputs into desired outputs. Inputs are the various resources and outputs are goods or services intended for customers [62]. In order to implement the described transformation there still have to be enough energy, supporting materials (i.e. e.g. machines, equipment, tools, etc.) and knowledge [68].

During the application of process-management there is a considerable emphasis on adequately controlled information systems (provision of information in the required quantity) and the level of human resources. Especially second requirement is crucial, and we could even shift it up. Each process can be so special by its nature that it is difficult to find a single procedure in their creation. However, the same formal logical page can be traced, which is common.

Hammer [7] understands the process management as an assurance that processes operate at the highest possible level of their potential, whereas there is a search for opportunities that lead to the improvement of said processes and subsequent implementation of these opportunities into reality. Process management can also be defined by using the following definitions:

„Business process management (BPM) is a systematic approach to making an organization's workflow more effective, more efficient and more capable of adapting to an ever-changing environment. A business process is an activity or set of activities that will accomplish a specific organizational goal"[52]

Process management (Business Process Management) is according to McCoy Sinur et al[47]a highly productive discipline of management. Companies that follow his rules have, according to the author, a competitive advantage over other companies.

2.1 Principles of process management

Process management is, more than other directions, based on the use of principles that are applied in the modern management methods. We distinguish the following basic principles that bind to [62]:

Work	**1. Principle of integration and work compressing** **2. Principle of delinearization of work** **3. Principle of most advantageous place for work realization**
Process	**4. Principle of application of teamwork** **5. Principle of process-oriented motivation** **6. Principle of responsibility** **7. Principle of the variant concept of process** **8. 3S principle - self-management, self-monitoring and self-organization**
Company	**9. Principle of elastic autonomy of process teams** **10. Principle of accessibility of information and knowledge**

The essence of the **principle of integration and work compressing** is thickening and conjoining the previously distinct and separate works into one process. This is done in both the horizontal and vertical direction. According to the approaches of process management this process is always handled by one team.

The purpose of the second principle (**delinearization of work**) is not performing the work in a linear sequence but simultaneously. This leads to shortening of the time between the beginning and the end of the process. This principle can also be fulfilled by teamwork, especially because each and every individual member of the team is substitutable.

Work must be carried out where it's best, regardless of the organizational structure. To ensure the implementation of the **principle of most advantageous place for work realization** transference of work from the inside out is used (this is the integration the customer into production), or vice versa outside to the inside (this is the integration of suppliers into the process of the manufacturer).

To fulfil this principle one can trace these following levels:

a) production level means that the customer is involved in product design. Production is carried out to customer requirements.

b) motivational level is built on customer involvement and thus determining his value metrics.

c) the strategic level shows the changes in predictions. In places with frequent changes predicting is problematic and therefore it is necessary to know exactly what the needs of our customers are.

The basis of the **principle of application of teamwork** is the preparation of process teams that have considerable powers and the result of their activity is evaluated according to maximisation of the added value for the customer.

The **principle of process-oriented motivation** is based on the principle that staff motivation in teams is tied to the outcome of the process and therefore to the amount of added value for the customer.

For the process according to the **principle of responsibility** is responsible the owner of the process. Owner's task is to lead the process and to be responsible for the fulfilment of its ultimate goals.

The **principle of the variant concept of process** is based on fulfilling the individual needs and requirements. From this perspective the applied concept of mass production is now obsolete. Each new variant of the process is used to ensure the needs of different markets and customers.

3S principle - self-management, self-monitoring and self-organization can be applied in the work of individual team members. However it assumes complete mastery both over

employee training and increase of their knowledge. Each team member must be accountable for their work, and there must be a direct motivational link to the results of the process. Self-monitoring takes place within process teams based on value metrics (value added to customer). Individual employees are also sufficiently independent to ensure the possibility of self-management. Self-organisation is then applied (and also occurs) in companies, in which specific organizational structure such as amoeba are applied [45].

The basis of the **principle of elastic autonomy of process teams** is reducing the cost of individual operations by appropriate use of centralized and decentralized management approach. Teams are flexibly assembled on the basis of customer requirements and certain activities are controlled "centrally" (such as e.g. buying in large volumes for the whole company). Implementation of this principle is allowed by the application of information technology and the creation of a unified database which all the teams have access to.

Application of the **principle of accessibility of information and knowledge** leads to the removal of deep-rooted information transmission (typical for functional management) which is based on the fact that the subordinate knows exactly what "must know" he has to know to be able to perform the commanded act. In new concept everyone in a company has the right to know all information and everyone can decide which of them they will need for their work. For this it is important to remove barriers of work interfaces, barriers of knowledge and information barriers.

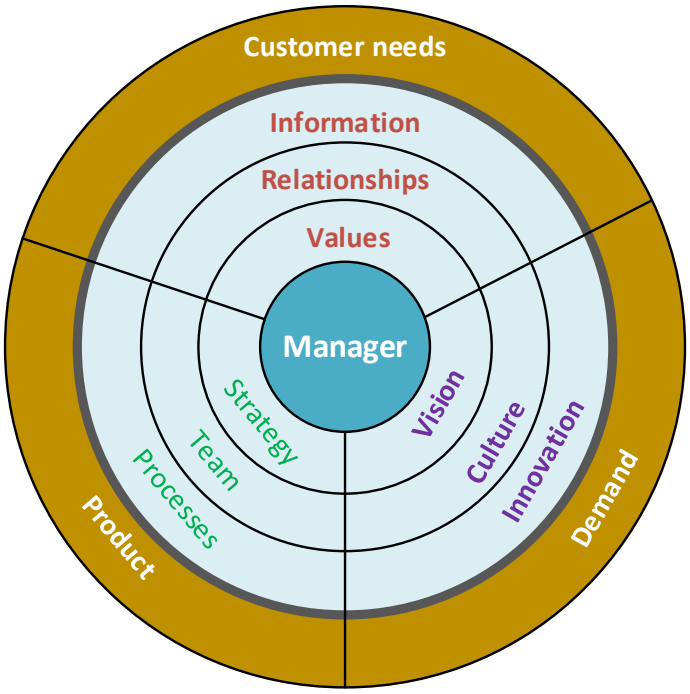
2.2 Aspects of process management

Process management represents, on the basis of the listed principles and of the essence of its implementation in accordance with the 3R methods, an integrated complex of activities, elements and relationships that represents a new perspective on management. The Rolínek et al.[51] have tried using mind mapping to define the important aspects. The outcome of this is the process management model shown in **Figure 1**, which is based on the concept of process management as a new direction of management and it incorporates modern management approaches.

Key elements of successful companies are, according to the opinion of the authors of this publication, knowledge of the most important values of key interest groups, definition the

mission and choice of proper strategy. These things should be followed by an effort to establish relationships both inside and outside the company (e.g. CRM system, strategy of cooperation, etc. are used). This is not possible without the development and cultivation of corporate culture and implementation of the principles of cooperation through teams. For the functioning of companies there is the necessity to ascertain information, especially on the competition and on the customer demand. Based on this information and with the use of creative potential innovation can be found and processes can be adapted and improved. The final output and the purpose of the whole system is, based on customer needs, to create such a product that they are willing and able to buy[51].

Figure 1: Model of Process Management Elements[51]



The model of the process management (**Figure 1**) is based on the principle of management from inside to outside (or one first increases the level of the internal environment, and then tries to influence the external environment). This principle is implemented through the following sequential steps[34]:

- in the first stage it is necessary to energize the internal environment of the company. This is possible to implement with the gradual improvement of its relative degree of complexity that is dependent on the value of reduction of entropy (disorderliness).

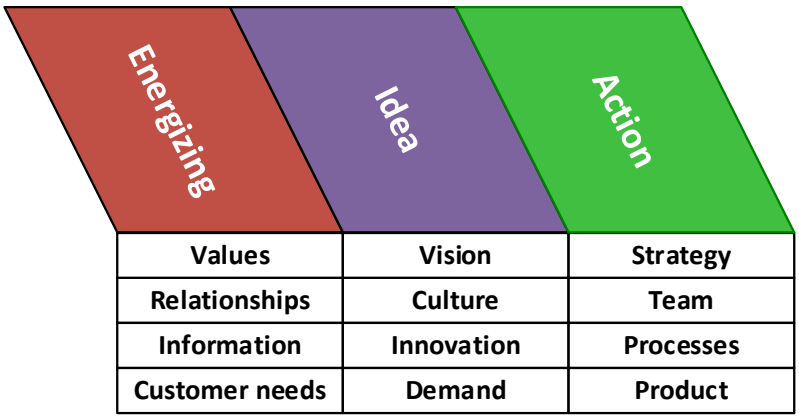
- in the second stage it is necessary to find and accept a certain idea of transition and change existing paradigms, which are applied in the company management (which can mean establishing new objectives, strategy selection, etc.).

- in the third stage the execution of the action or the introduction of new concepts follows (e.g. it can be an implementation of strategy and subsequent evaluation with the aid of feedback).

The individual stages (energizing, finding ideas and execution of the action), which form the essence of company management are difficult to separate from each other in many aspects because the boundaries between them are significantly blurred.

Process management elements shown in **Figure 1** can be assigned to individual stages of company management (energizing, finding ideas and execution of the action) as shown in **Figure 2**. This means that if management e. g tries to successfully define and apply the strategy it will need to firstly identify, understand and express values. It is necessary to express the values in the mission. And also for a successful creation of teams the management will need to describe relationships and work with the corporate culture as a set of ideas and so on.

Figure 2: Elements of Process Management[51]



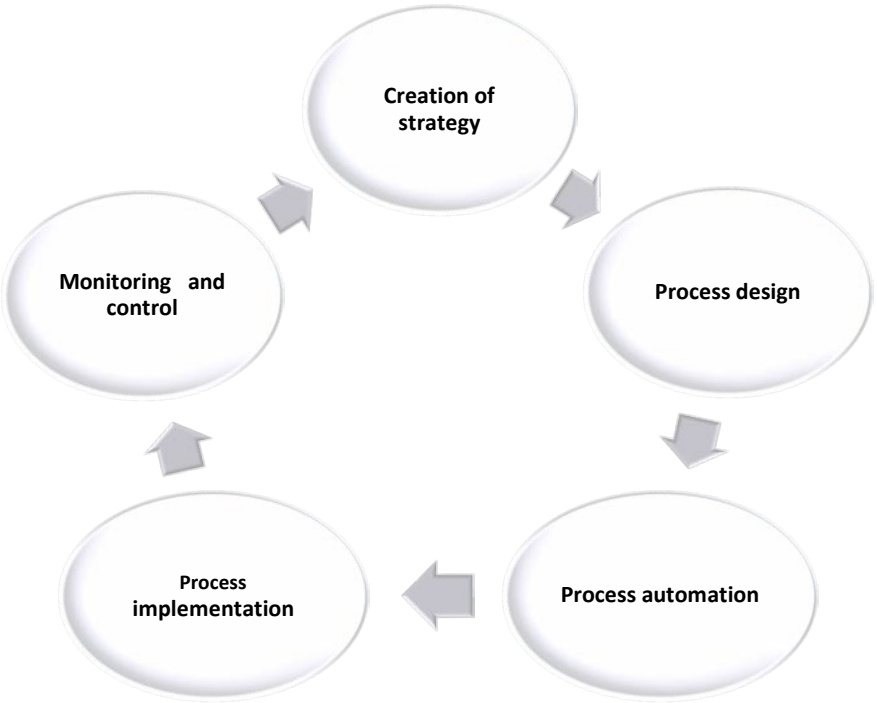
2.3 Phases of process management

The essence of process management can be expressed by the model of its individual phases (**Figure 3**). These listed phases can, when appropriately implemented, provide the necessary steps in the design (prospectively description), implementation, automation of processes, and determination of process performance[37].

The first basic phase of the model of the process management is the design and selection of appropriate strategy in relation to the business model and its development up to the level of the key performance indicators (KPIs) so that it can be used for process management (e. g. with using the BSC method).

The second phase is the actual definition and design of business processes based on the identification of sources and conditions for their implementation in relation to the factors of external and internal environment, the strategy chosen and designated key performance indicators. Part of it is also the draft of performance indicators for evaluation of process performance i.e. determination of the method of measurement and the subsequent configuration of the system for worker performance evaluation.

Figure 3: Phases of proces management[37]



The third phase is characteristic for automating the designed company processes.

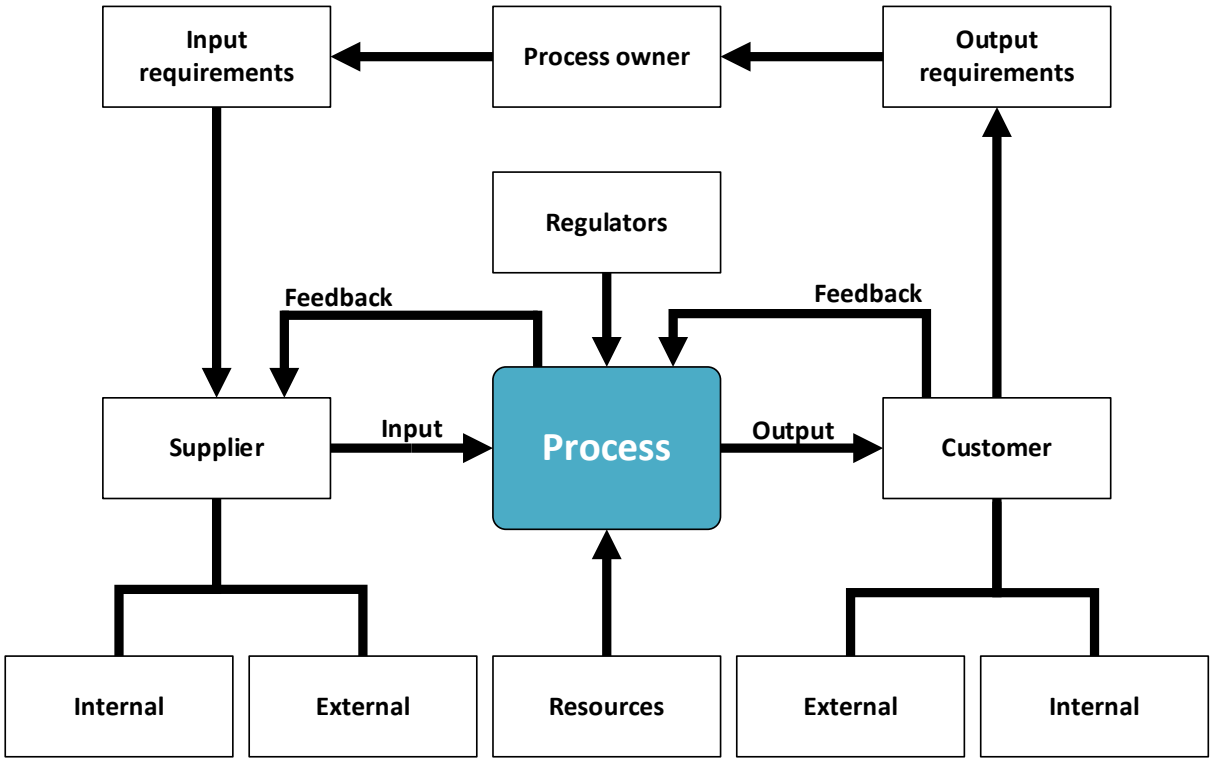
The next stage is the implementation of processes with the possible use of IT infrastructure. Within the last phase management deals with monitoring of performance of processes, identification and analysis of deviations and addressing and removing deficiencies.

3 PROCESSES

Basis of the methodology of process management is the orientation on the most effective operation of processes.

They represent a set of activities that are logically separable, interrelated and transform inputs into desired outputs. These are defined as a set of activities that are logically separable, interrelated and transform inputs into desired outputs (**Figure 4**). The term process can be defined in many ways. Process is defined similarly e.g. in the ISO 9001 standard, in which it represents a set of interrelatedly interacting activities which transform inputs into outputs.

Figure 4: Process diagram [8]



Process is a word derived from the Latin word “procedere” which translates into “proceed”. It is thus a sequence of certain events or events that occur in succession. "Every action we take is a mixture of inputs, actions, and outputs - the classic definition of process. Some of these processes are simple: The input is an old piece of paper, the action is wadding

and dropping, and the output is trash disposal. (...) Others seem simple, but are infinitely complex. The input is sound, the action is hearing, and the output with the enjoyment of a fine piece of music " [8].

Řepa [55] defines it as follows: "Company process is generally understood as objectively natural sequence of activities held with a view to achieve the objectives of the objectively given conditions". In her publication, Svozilová stated [60]: "A process is a series of logically related activities or tasks through which - if they are gradually exerted - a predefined set of results should be created" and in Grasse's publication [21]: "A process can be characterized as a structured series of follow-up activities which describe the work flow - process of creating the added value - progressing from one employee to another, providing measurable service/ product to an internal or external customer, assuming the conversion of inputs to outputs and the utilisation and consumption of resources". However, it is possible to meet with many graphical visualizations. As an example a diagram from publication Processionally-managed organization can be mentioned in which process is introduced both graphically and verbally. "The process: it is a set of interrelated activities, changing inputs into outputs while consuming resources under regulated conditions. In the application of process management it is unique for each organization on how will they decide which things should be considered as a process and which as activities or sub-processes" [1].

For processes the sequence of activities is important since each is performed in a different time, which also means that you can put these activities into a timeline. Process management therefore describes the temporal, not spatial structure. This definition implies that the most important things are: goal, intention, dispassionate naturalness of the process and objectively given conditions.

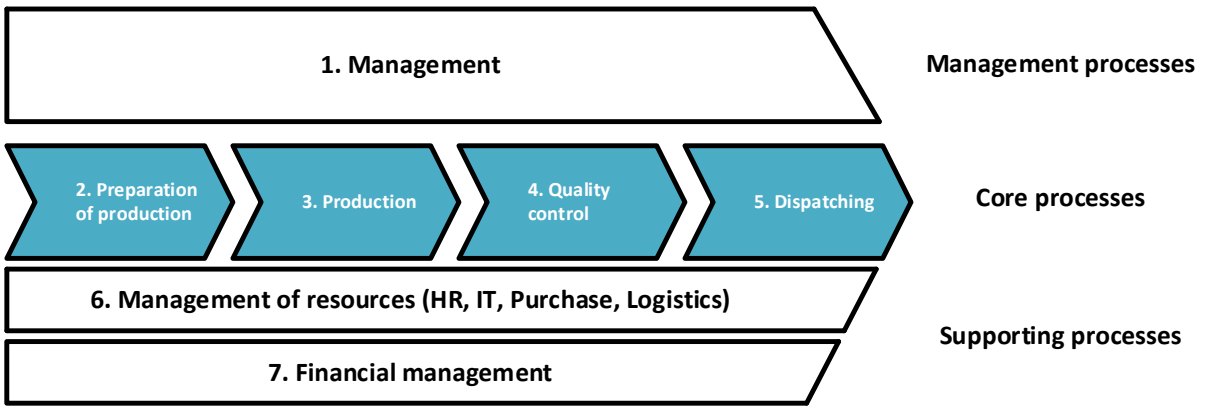
When processes are addressed in the company there is an often occurrence of concepts such as action, task or activity. E.g. Svozilová defines these as follows [60]: "The activity, task, or activity is measurable unit of work whose purpose is to transform the input element intto a predetermined output". Grasse writes in the book Process management in the public sector [21]: "The functionality of the process is a comprehensive sequence of operations (work tasks) performed by one type of worker or within a single unit in continuous time and mostly in one place and whose output is a measurable product (service /

commodity)". It is therefore the smallest measurable unit of work, with a certain duration and with the connections to other tasks of process, entailing costs for the conversion of inputs to outputs.

3.1 Types of processes

During the application of process approaches the management, core and supporting processes are defined (**Figure 5**).

Figure 5: Types of processes[31]



Core processes

Core processes are usually associated with products or services and add value for customers. Their goal is the fulfilment of customer requirements, which include providing services, manufacturing products, as well as mapping the entire chain of these activities. We can say that the core processes fulfil the mission of the organization. According to Grasse [21]: "The core (key) processes are value-creating processes designed to fulfil the organization's mission, by which the added key value (key output) is secured, which leads to the satisfaction of the needs of external customers". Core processes include demand, sales, implementation, service, product development, promotion of implementation or trade promotion implementation.

Supporting processes

Supporting processes are used to support core processes (e.g. providing resources). These are the processes that ensure the operation of the organization. Thus, "they are the processes that ensure that the organization is able to provide the services and products required to ensure its functionality. Services and products emerging from these processes are inputs to the core and managerial processes (they have an internal customer) "(Grasse et al., 2008). They support the core processes, but are not their direct part. The operation of the organization, finance and human resources are all included here.

Management processes

The third type of processes that are defined within the process management, are the management processes. Although they mostly are processes that could be included in the supporting processes, management processes have a range of peculiarities. For example their product cannot be clearly determined. These processes are also cross-cutting and often their output contains setting of indicators and measurement methods of other processes.

They are sometimes also known under the term managerial processes and are designed to manage development of the organization, its strategy, quality, and also have to check whether the framework processes operate in accordance with the rules set in advance. In other words: "The management processes are processes that are designed to translate the strategy into management of the organization or to directly change the strategy. They are, therefore, processes of strategic and operationally-tactical character that ensure the organization is moving in the right direction " [21] . These can include, for example, planning, control etc.

Mentioned division of processes is yet only one of many. Business processes can be classified on the basis of their period of existence (permanent or temporary, i.e. nonrecurring), repetition frequency (high or low repeatability) or even the structure of the process (data, i.e. programmed or knowledge-based, i.e. creative, changeable) etc. [21].

We measure the actual efficiency of the processes with a set of indicators reflecting the level of the final value that is provided to the customer. Truneček[62] indicates that this

value metric cannot be used generally for all processes, although it usually is a selection from the following four groups of indicators:

- customer perceived quality;
- services provided to customers;
- costs;
- time parameters of the supply;

These values metrics are, according to author, especially important for management, monitoring and subsequent process improvement.

An important part of the implementation of process management, which differs from other approaches to management (such as strategic management, change of corporate culture, change in the organizational structure etc.), is the use of process analysis, enterprise model and in particular the process maps [62,68].

3.2 Process maps

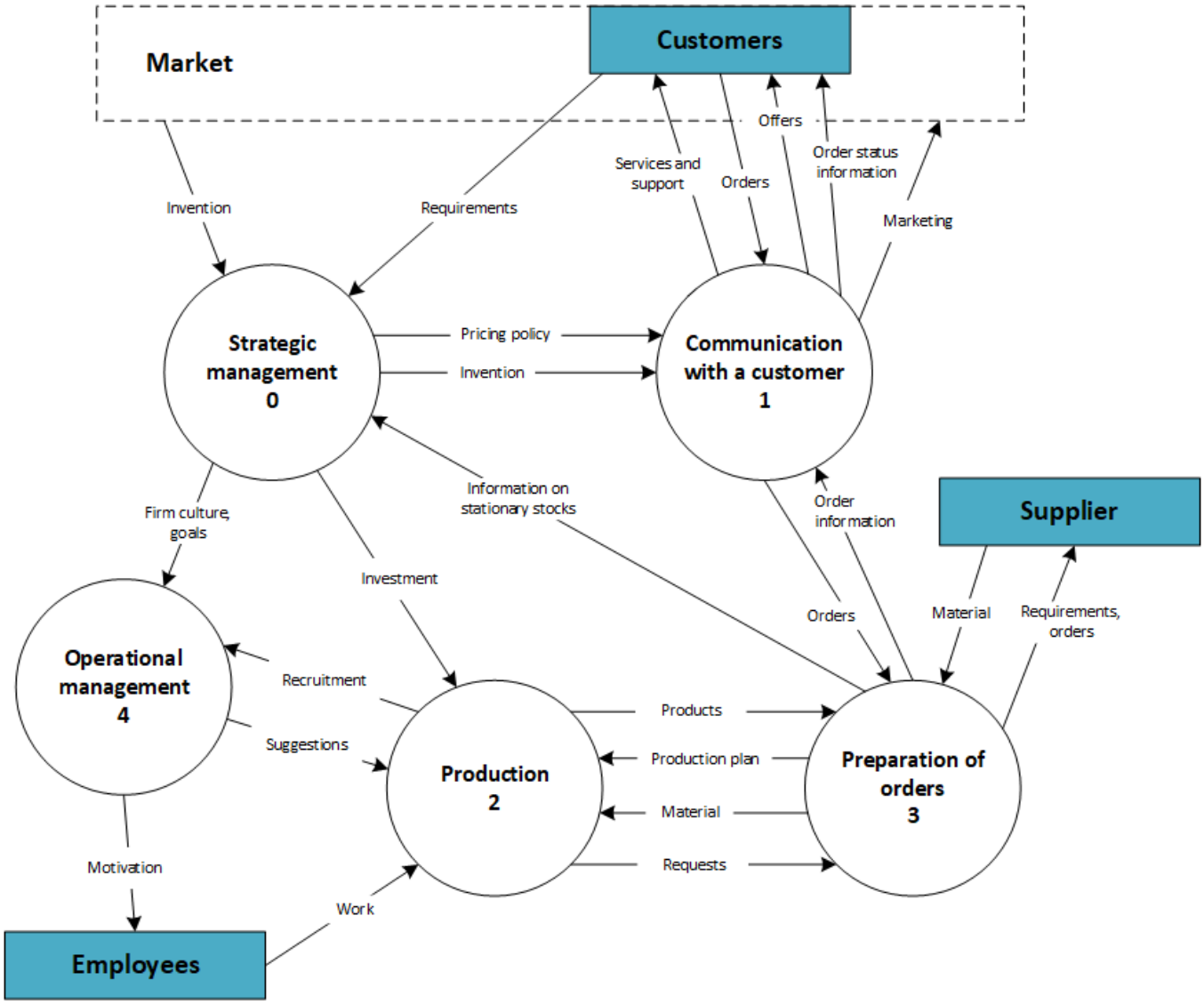
Process maps are used to record the processes, which take place in the company, both the production and management ones. The main requirements during the course of their representation is the simplicity and completeness. For a graphical representation and a record one can be use a variety of tools that in many cases actually are complete systems for process modeling, such as. ARIS or ProcessGuide Power Designer [54]. Self-description of the processes and their differentiations from general to detailed (and also the meaning of the segmentation of process maps) can be performed according to the principles of the process analysis [18,62].

Figure 6 shows the process map of the zero stage of the selected company. It is a description of the current situation. The company implements a functional organizational structure and basic elements of functional management are being used.

To illustrate the creation of process maps the fairly widespread system ARIS is further described. The author of the ARIS system is Prof. Dr. August Wilhelm Scheer. In comparison to to other modeling systems [54] such as e.g. methodology of Hammer and Champy [23], T. Davenport [9], Manganelli and Klein [46] ARIS represents a more comprehensive instrument which stems from the broader conception of aspects of company management. In addition to

recording processes ARIS also covers eg. organizational structure, data sources and performances.

Figure 6: Process map [62]

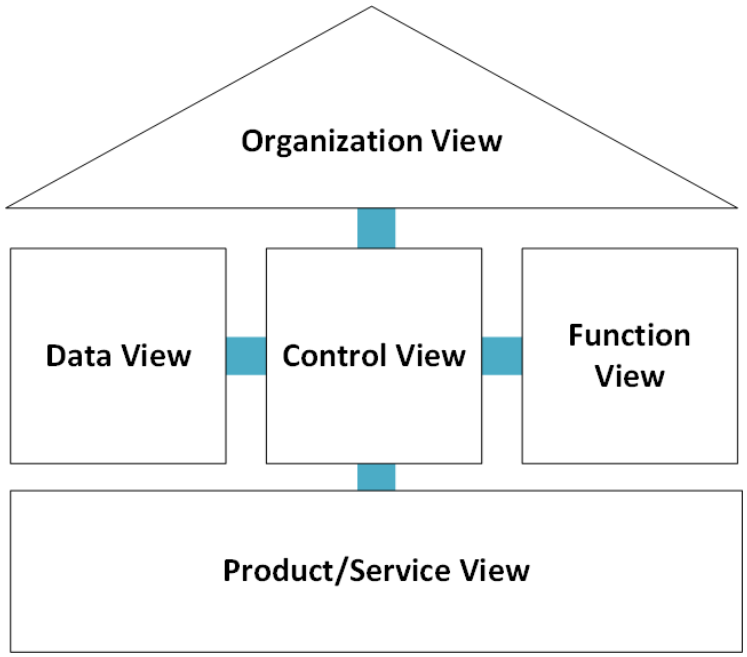


These different perspectives are interconnected and provide a source of information for company management. The basic views of ARIS include (**Figure 7**):

- Organizational view which represents the record of the organizational structure within which the positions of the workers and their assignment to organizational units are captured.

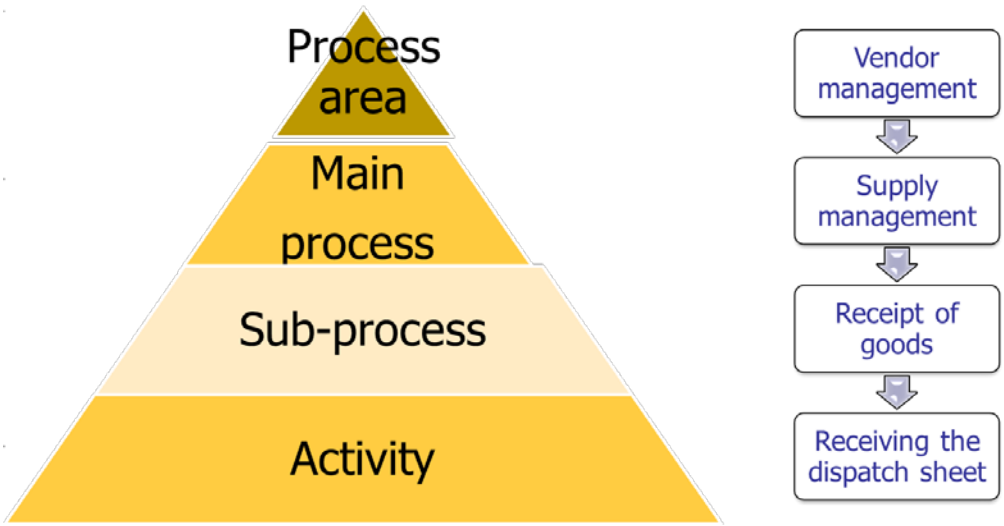
- Data view within which the stages of states and events are recorded.
- Functional view which focuses on defining functions (in ARIS function is understood as an activity) and the relationships between them.
- Process (control) view, whose essence is the determination of processes and relations between them. According to the system processes represent the basic and integrating element in company management.
- Executive view which defines the characteristics of outputs (i.e. the type of an output, and metrics definitions).

Figure 7: Aris House[57]



The essence of the application of this system is using an approach based on respecting the concept of stages. In the most common position processes are recorded in the processing area. These processes are furthermore described in detail in the stage of main processes, sub-processes, and in the most detailed view in the field of activities. This mentioned hierarchical approach of recording the processes from the general to the detailed is characteristic of recording the processes even in other systems (**Figure 8**).

Figure 8: Process maping - concept of stages [29]



When assembling the process maps in ARIS the following procedure can be observed the most frequently (**Figure 9**). First, the processes are recorded in the so-called process map with the main processes of MPTH which consists of three basic types, namely management, core and supporting processes. Each of these processes is then further developed in the so-called stage of main processes. In the notation the principle of the same name of processes at different stages of the notation is to be adhered to. The most detailed level of notation is the formulation of the so-called EPC (Event-driven Process Chain). Within the EPC workflows are represented in a way that the chain of processes describes how interrelated the data, process steps, information systems, organizational structure elements and products are [29].

In terms of naming conventions, the processes within the MPTH map are represented by the symbol used in the context of value management with a name that should be derived by one or more nouns or prospectively extended by an adjective, prefix or suffix (e.g. Strategic planning, Order processing, Payments, Addresing the potential customers, etc.). Models that are hierarchized to an object take its name (**Figure 10**).

Figure 9: Process landscape *(modified [29])*

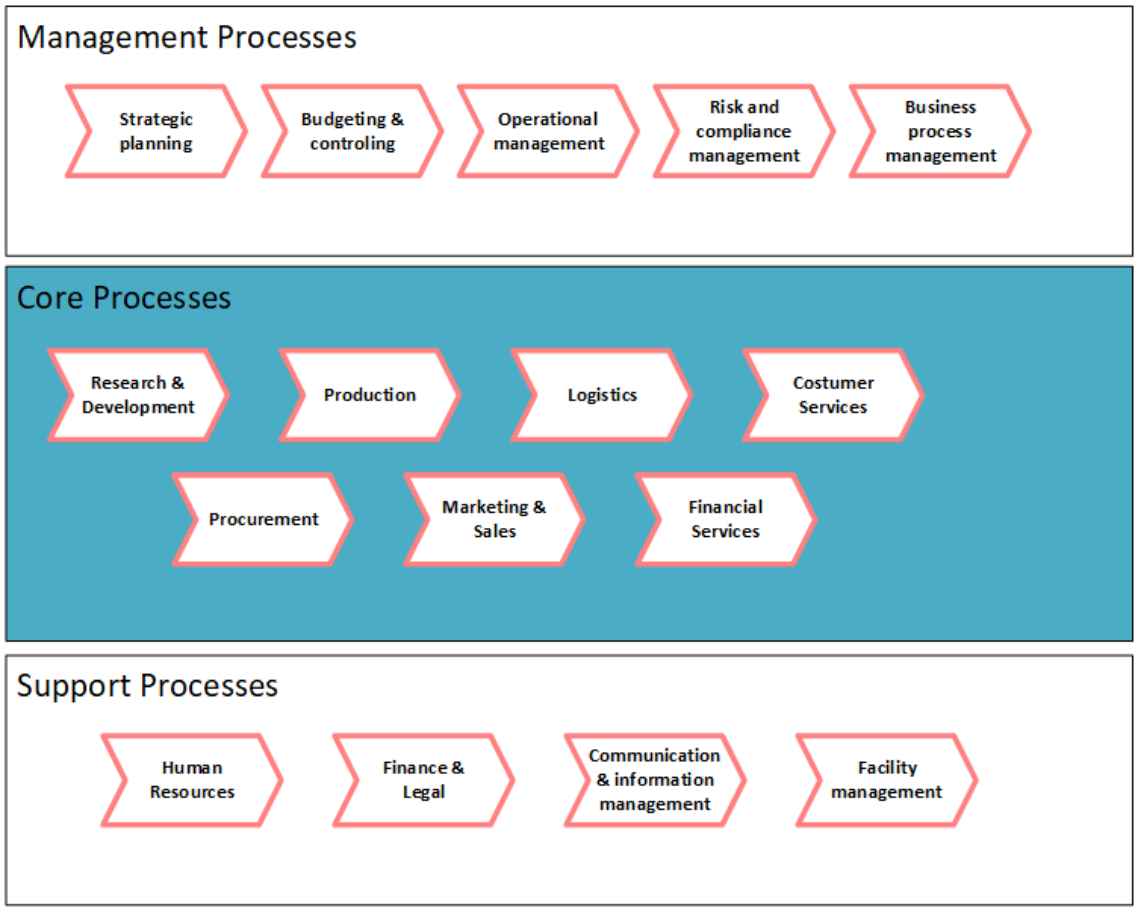
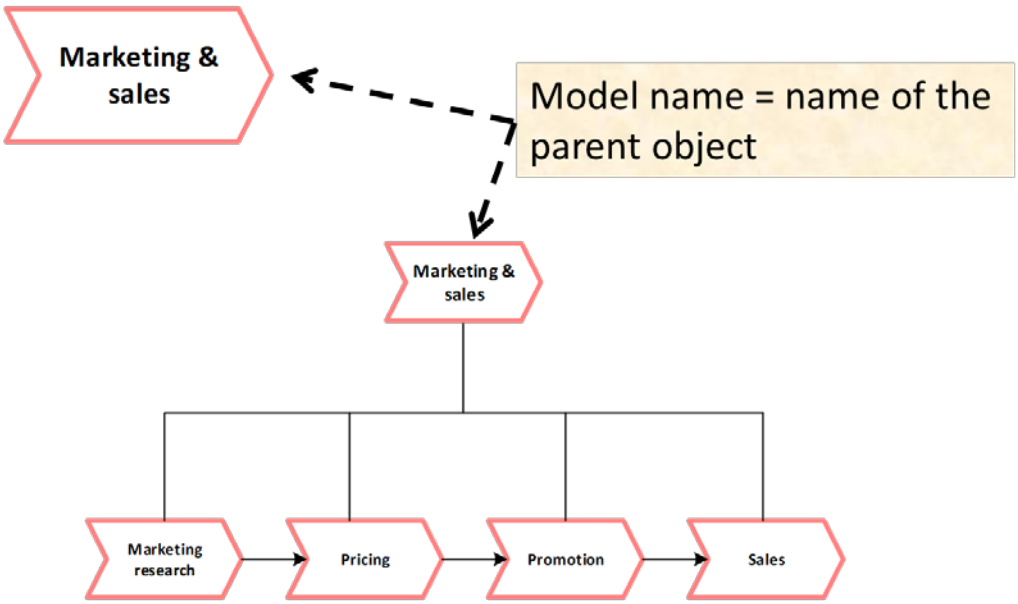
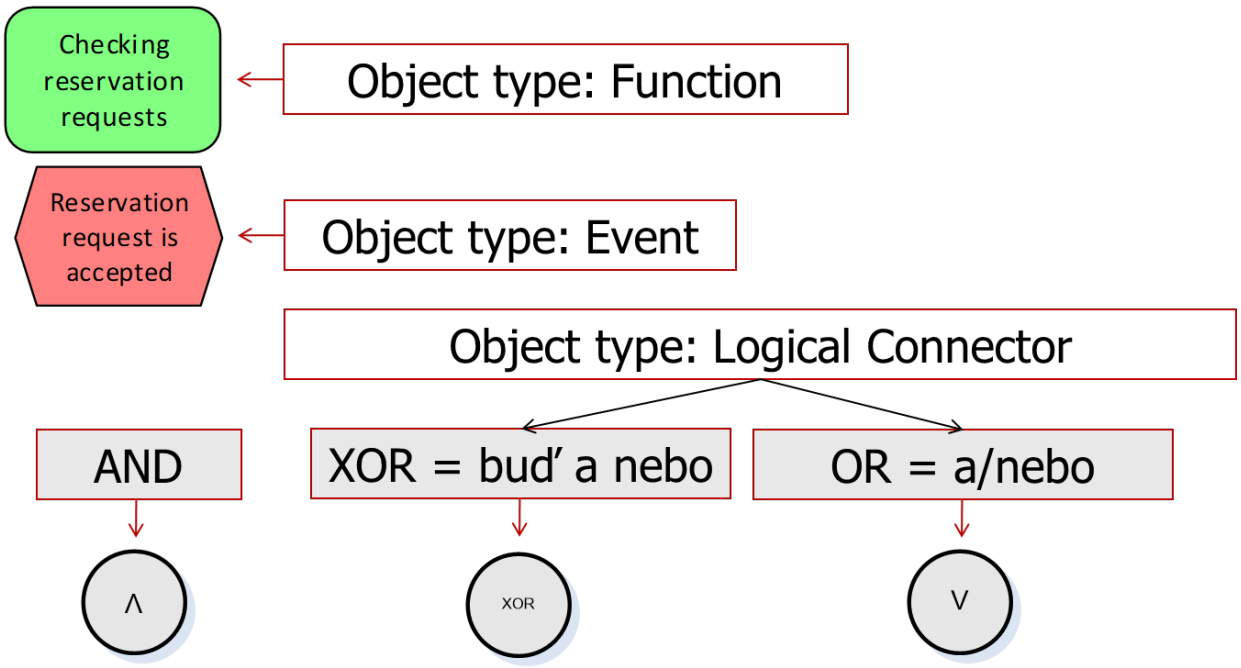


Figure 10: Example of naming conventions *(modified [29])*



In the modelling of EPC naming conventions are used in differences according to the types of objects (**Figure 11**). The most commonly used types of objects include functions, events and rules (logical operands).

Figure 11: Types of EPC objects *(modified [29])*



Functions (synonymous with activity, process step and procedure) in the ARIS system are construed as professional task that is performed on the object which supports the realization of one or more goals. In terms of naming convention, the name of the function operation (usually a noun in the nominative singular of the activity name plus an infinitive) and information object (usually noun in the accusative singular). Event object describes the state of the commercial relevancy of the information object which controls or influences the subsequent course of the process. A naming convention of event represents the information object (usually noun in the nominative singular) and the change of state (past participle). In addition to these, some other elements related to organizational structure, information systems (Data-stores) and products are also used within the EPC.

In the compilation of the EPC diagrams the following rules are abided (IDS Scheer, 2005):

- Each EPC starts with at least one trigger event (or process interface).
- Each EPC ends with at least one terminal event (or process interface).
- Event is followed by either function or operand (the exception is the final event).
- Function is followed by either event or operand.
- Each function has one input connection and one output connection (except for the terminal or the input event).
- Each event has one input connection and one output connection (except for the terminal or the input event).
- Operand either has more than one input connection and one output connection or one input connection and more than one output connections.

4 IMPLEMENTATION OF PROCESS MANAGEMENT

Implementation of process management represents mainly a particular restructuring of the system of company management. This can be done by utilizing the 3R method, which is based on the following steps: Rethinking, Redefinition and Redesign.

In the first stage of rethinking it is necessary to find a new corporate vision, assess and possibly begin to change corporate culture and undoubtedly also make the necessary personnel changes (and in many cases in the management of the company). It is also necessary to identify the critical success factors of the company and also determine the values for the customer.

In the implementation of redefinition we can trace the following procedure which is the development of company strategies (e.g. using a BSC system[25]), the application of process analysis with plotting of process maps and a draft for a new organizational structure.

In the last stage of redesign we conduct a change of individual processes. For that we use the application of individual principles of process management and focus on eliminating the unnecessary activities, filling missing activities in, innovating inefficiently performed activities, effectively arranging architecture processes and also integrating the suppliers and customers into our processes [62].

This process is similarly, albeit in a modified form applied in other methodologies of implementation of process management (or process reengineering) such as methodologies by Hammer and Champy, Davenport, Manganelli and Klein, Kodak and DoD[54].

4.1 Implementing Project

Transforming of the business culture from functional to process-based is considered the most challenging and difficult task of planned changes. Company restructuring cannot be done without a certain predetermined methodical procedure and the necessary documentation. Implementing project elaborates and specifies, in relation to the above methodology, all the necessary activities that need to be done for successful implementation of changes.

It has the following stages [17]:

0. Initial analysis of changes

Initial analysis aims to determine whether the enterprise needs or does not need to change. Case study is processed in which it is necessary to substantiate the costs and benefits of the planned action and to justify the need for change.

1. Provision of resources for the change

We must determine what resources we will need for the project mainly in three areas: people - creating a team, information system and information technology, and financial security. The owner of the process is the manager who is responsible for the progress of a particular process. The manager ensures the implementation of a process that he will lead in the future. He also obtains resources, supports other team members, represents and protects the entire team. The implementation team is a group of people who actually carry out the project and bring it to life. The team should not have a leader but a coach, who is the first among equals. It is recommended that the team structure is sufficiently flexible. There should be specialists in the fields of finance, information systems, manufacturing and marketing.

2. Knowledge eligibility of the company

This step assumes both provision and implementation of the plan for the management of the process knowledge and initiation of the corporate culture change.

3. Conceptual task

The output of this step is the project statement that contains the following:

- causes of the current situation,
- answer to the question of what will happen if we don't implement the project or what the risks of the project are, or what happens if the project fails,
- specification of the progress of the project, its various stages and timing,
- creating the vision of the project.

4. The formulation of the project purpose

This step is mainly about vision (whether current corporate vision meets the new objectives of the project and whether it is necessary to create a new vision), goals (this involves clarifying objectives, given the limited resources that we have available) and values (clarification of values has the character of controlling the progress of the planned knowledge objective and startup of a new business culture). The output of this stage is the Policy Statement.

5. Critical Success Factors

In this step, we need to identify the factors that are critical to the success of the organization. CSF usually involve:

- customers, suppliers and internal staff
- environment factors,
- method and system of company management.

6. Process Map

Goal of this phase is to develop a process map of manufacturing and control processes. A key requirement is the simplicity and completeness of representation of the progress of the processes. Compilation of the process map is a creative work and requires a thorough knowledge of the management of a company.

7. Determination of priorities of processes

Based on the process map one should assess the performance of each process individually and classify them according to performance in five categories:

A - excellent efficiency,

B - good efficiency,

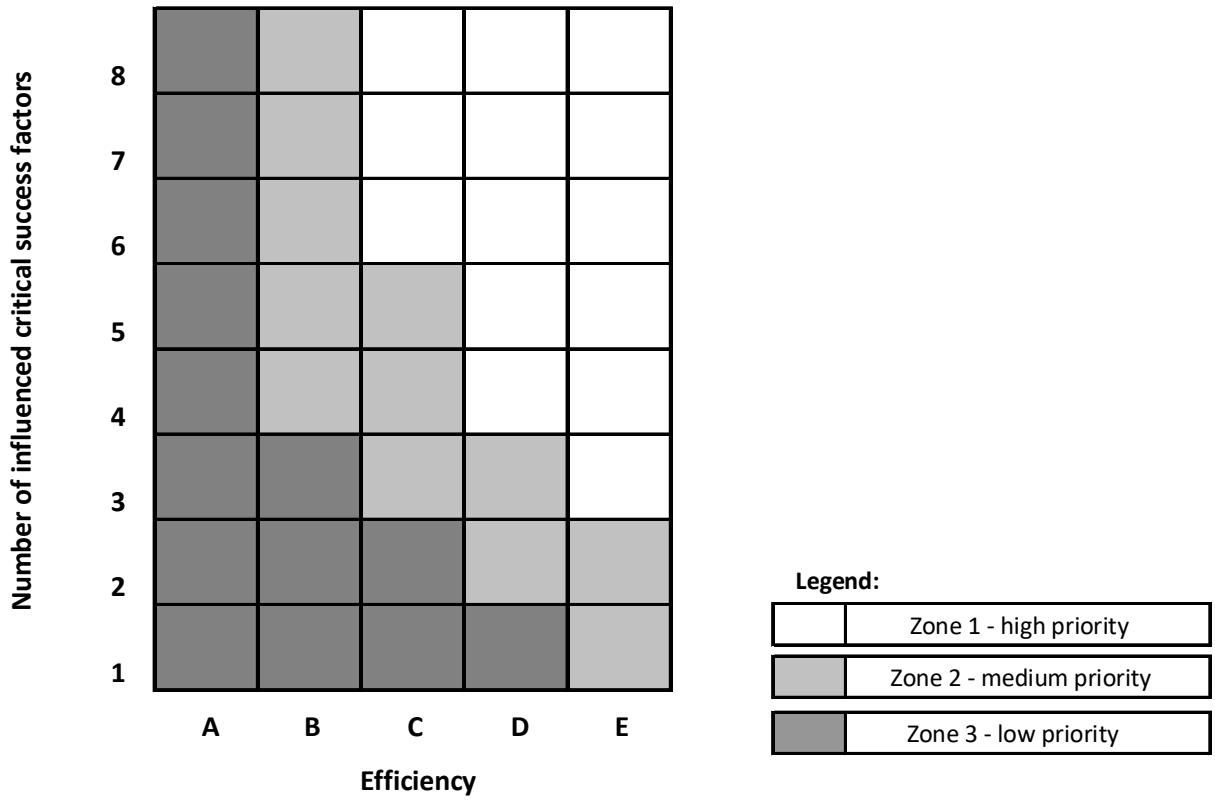
C - passable efficiency,

D - inadequate efficiency,

E - poor efficiency.

Then the map of priorities is laid down. Those processes that affect the most critical success factors and have the worst efficiency, gain high priority for redesign. The more processes get into the zone of high priority (top right), the more they are in need of redesign.

Figure 12: Priorities of processes *[17]*



8. Selection of order of processes selected for redesign

The team should collectively discuss and clearly agree on how the boundaries of each zone should be set out so as to be able to select a group of processes (or even only one main process) which will undergo redesign. Three zones (**Figure 12**) can be characterized e.g. like this:

- Zone l: Strategically the most important processes for the company, but their performance is relatively poor.
- Zone 2: Processes with less opportunity to influence the performance of the organization, but improvements can significantly affect processes in the zone l.

- Zone 3: These processes have either minimal impact on organizational performance, or are provided efficiently. They provide relatively little space for redesign. They should be monitored, but their redesign should be approached after securing foregoing zones 1 and 2.

9. Application of principles to processes

The purpose of this step is to apply the following to the processes:

- basic principles of process management,
- selected recommendations for the creation of processes,
- methods to improve processes – e. g. **Analysis of the added value**, which focuses on the concept of the whole process and which all steps are subdued to in order to examine how which activity adds the added value. Each step is analyzed in terms of: how much it adds to the actual and business value or if it adds zero value and is therefore unnecessary.

10. Redesign of processes

The objective of this phase is to redesign processes in order to achieve the corporate vision. It is a crucial stage, so it is necessary to devote the necessary care. Instrument for the implementation are seminars and meetings. Work will be attended by representatives of various departments, experts and external consultants. The output of this stage is a document called the **reform project**, which has three parts:

I. Technical part mainly contains characteristics and the description of the existing organizational structure and also the proposed new procedural maps, including the redesigned processes.

II. The infrastructure consists of:

- draft of a new strategy to support declared vision
- value metric that shows how well is measurement of performance mastered,
- remuneration system, weighted on the proposed new organization and performance measurement.

III. Soft management components comprise mainly informal structure of the management and its impact on the overall business management, and a description of the new corporate culture and characteristics of its introduction to practice.

11. The plan of implementation

It should particularly respond to the following questions:

- How to involve the individual organizational units in the new process environment?
- How to cope with the reduction of job positions?
- How will the customers be involved in the project?
- Which stages will we implement the project in?
- Will the project be implemented all at once or in parts?

12. Managerial approval

Main output is a summary report which should contain a concise conclusions from all previously processed documents. The summary report shall primarily include:

- Progress of ensuring the process capability.
- Report on the vision, values and goals.
- Complete project of change.
- Estimated and accurate statement of benefits.
- Implementation plan.
- Provision and allocation of necessary resources.

13. The actual implementation

It is about ensuring the correct procedure, orientation and implementation of work. Business process improvements should be visible and measurable. Every 6-12 months progress should be evaluated and possibly corrected. The output of this stage are the realisation measurement results.

14. Permanent improvement

Improving redesigned processes is permanent matter [62].

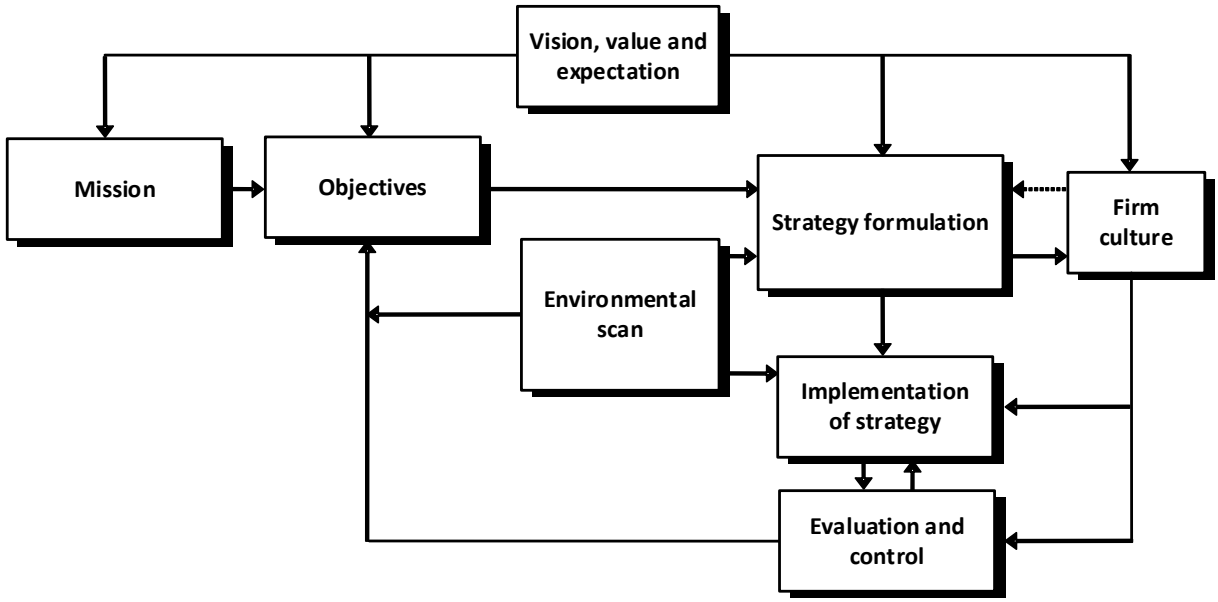
5 STRATEGIC MANAGEMENT AND PROCESSES

Strategic management can be characterized as *"the process of determining the long-term goals and objectives, adaptation to environmental conditions and allocation of resources for the organization in relation to the set objectives."* Another possible understanding is *"focus on the scope of activities of the company in the long term, which ideally creates a harmony between corporate resources and the ever-changing external environment - especially market and customer"* [27].

Strategic management is focused on identifying the key factors of the development of the company as a whole in a longer term. Its main output is to design a strategy and determine the KPI (key performance indicators). Implementation of the strategy then directly determines in which way the individual company processes will be set and managed.

Basic principles of strategic management can be demonstrated using a variety of models. One of them, the advantage of which is a representation of the process of strategic management as the concurrence of individual activities, is an integrated model of strategic management processes (see **Figure 13**).

Figure 13: Integrated process model of strategic management [27]



Integrated process model of strategic management consists of elements which may be defined as follows[27]:

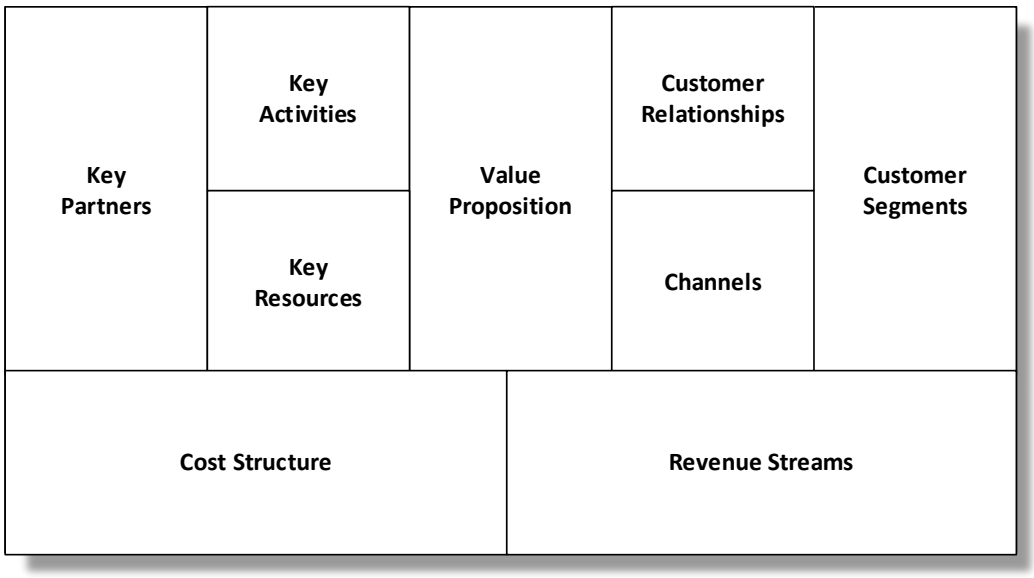
- Definition of the subject matter of activities (***the mission of the company*** which depends on vision, values and expectations of key implementers - interest groups or stakeholders). Management should define the area of business, answer questions about e.g. the nature of the company, on which markets the company will move, who is our customer, etc .;
- Assessment of ***strategic and performance goals*** (in the model, intentions and goals are important) Goals could include e.g. the assessment of future position on the market, annual profit, achieving the value of the selected financial indicator, etc .;
- ***Strategy formulation*** (assessment of strategy alternatives, their evaluation and selection). We look for the answer to the question of how to achieve future goals. The basis of it is to use the results of analyses of internal and external business environment (analysis of the situation) and devise detailed plans of actions;
- ***Implementation and realization of the chosen strategy*** (strategy implementation). This phase is associated with the formation of organizational structure, employee motivation and among other things it also touches on the level of corporate culture;
- Evaluation of results and proposed amendatory measures (***strategic control***). Control serves both to determine the success of the chosen strategy and is also a signal for necessary changes at any stage of its implementation.

5.1 Business model

Relatively modern tool that is currently used in the strategic management of the company, is the creation of i.e. business models [19]. Business model describes the basic principles of how an organization creates, transmits and receives value from the perspective e.g. economic, social, corporate culture etc. [50]. Among the building blocks of a business model are, according to the author, customer segments, value propositions, channels, customer relationships, revenue streams, key sources, key activities, key partners and cost structure (**Figure 14**). This

model can be divided into two parts, the left half representing the structural elements which provide the efficiency and the right elements which ensure the value.

Figure 14: Business model a and its elements[50]



The design process model usually consists of the following four phases: *mobilization, understanding of the context, design, implementation and management of the business model.*

Mobilization is the first step, in which the objectives of the project are determined, the preliminary entrepreneurial ideas are tested, the project team is put together and various activities are planned. A significant part of the first phase is also defining a common language with the use of canvas of the business model, which serves as a tool for recording ideas and it promotes mutual communication.

The second phase, which is the ***understanding of the context***, is aimed at understanding the nature of potential target markets, observing the environment with the use of e.g. marketing research, interviews with experts and the like. The result should be a deeper knowledge about the customer.

For the ***design*** phase it is characteristic to form variants of business model designs, to research all the variants and determine the best one. Designs of the models are usually implemented through cooperation with people from across the company and are used to

eliminate stereotypes in the creative problem solving systems such as e.g. brainstorming. In the event that it is necessary to test the proposed options, business models are converted into stories and those stories are presented to external experts or potential clients. This approach ensures feedback.

The last phase, which is ***the implementation and management*** of the business model, is the implementation of the adopted business model and whose nature is essentially a description of related projects, identification of milestones, organization of all legal structures, preparation of budget and project plan, etc. [50].

5.2 BSC

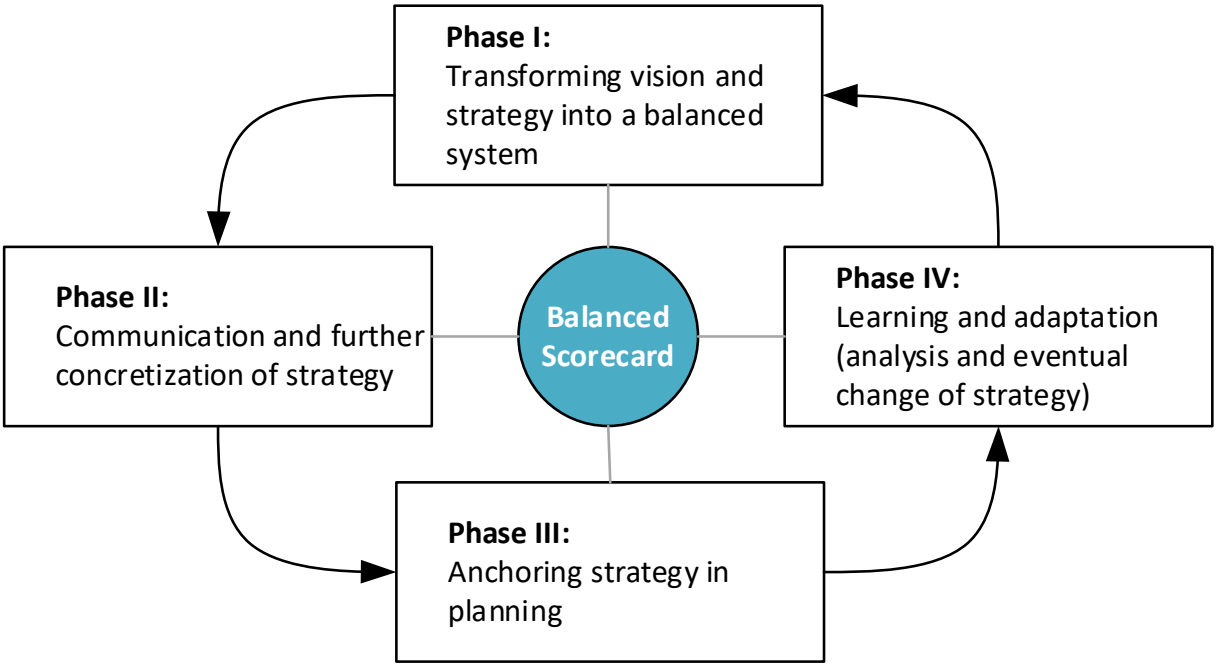
The importance of business model for the strategy creation, arises from its essence, which is the expression of the logic of a functioning company or in other words how the company creates value. Strategy then represents a way of how to implement chosen business model(s)[7].

The second important tool, in addition to the creation of a business model, that has recently been applied more, is the BSC system. This concept was developed in the early 90s by Kaplan and Norton [32]. The reason for its creation was to extend the system of indicators, with which companies and possibly even their processes could be better managed. The main basis was the perceived inadequacy of the, then widely used, one-sided assessment of companies with a set of financial indicators. The problem of using them is that they are primarily based on the assessment of past events and are not always suitable for predicting future trends. The word "balanced" can be understood as a balance between short- and long-term objectives, between financial and non-financial benchmarks, between external and internal performance factors. The original intention to create a system to measure the performance of the company soon grew into building a management system that provides the following functions (**Figure 15**): *to clarify, to convert the vision and the strategy, to connect the communications between vision and the strategy, to plan, to set goals, to write down strategic feedback and the learning process.*

The process of clarification and conversion of the vision is realized in the first steps by the teamwork of the senior management, which shall specify the strategy through the

delimitation and the definition of strategic objectives. These goals are set for four basic BSC areas, namely finance, customer perspective, internal business processes and perspective of learning and growth (**Figure 16**). For each goal its own benchmarks are determined and thus developed system is published within the company (e.g. through company newsletters, bulletins, etc.). BSC promotes dialogue among stakeholders (e.g. leadership and individual departments) and facilitates the implementation of strategies and the sharing of responsibility of those involved.

Figure 15: Balanced Scorecard - Strategic Management System [25]



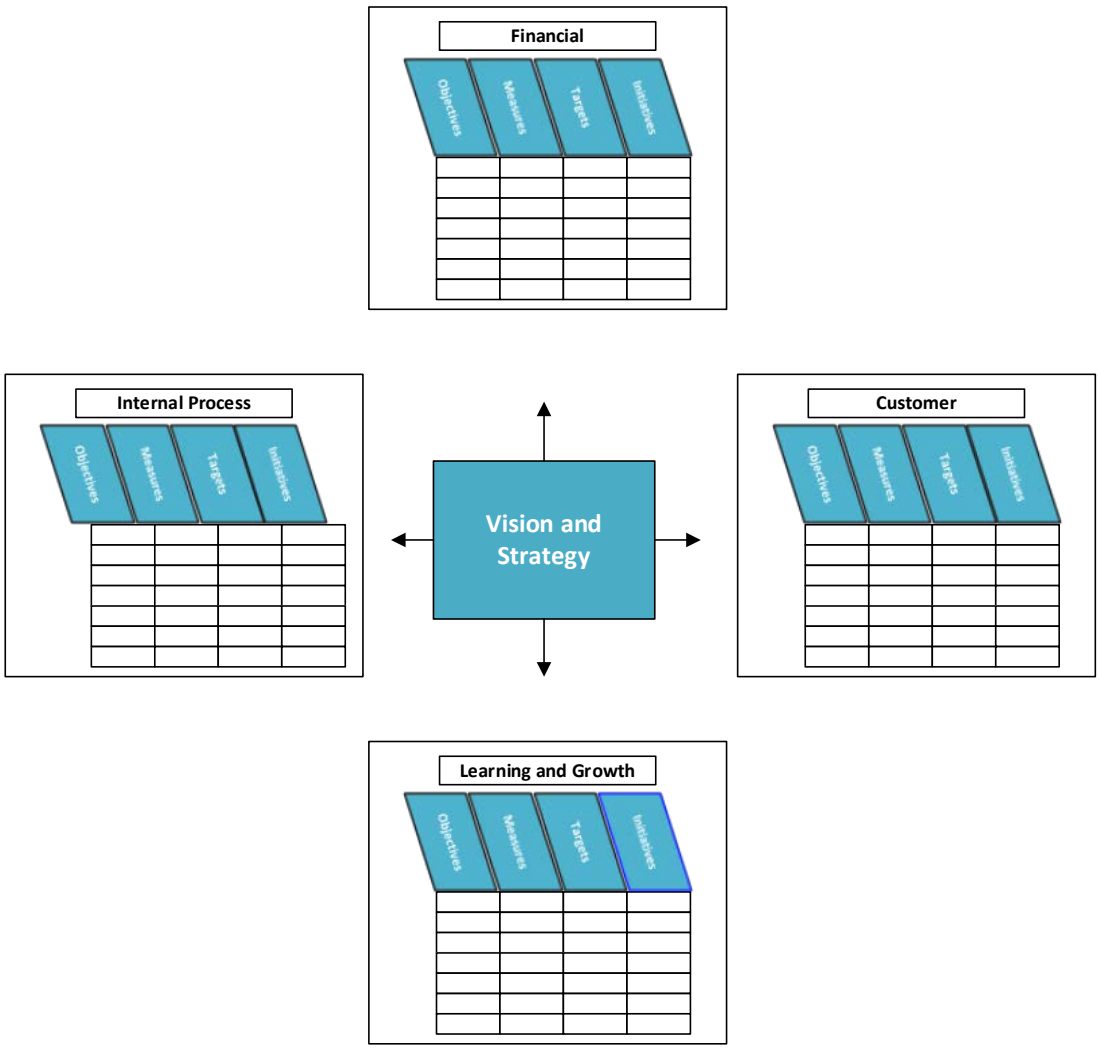
To specify the goals in various areas, managers can also determine the order of their importance. However, it is important to realize that well-conceived goals represent an integral system, in which they overlap and complement each other.

The process of defining the goals and the subsequent planning allows us:

- to quantify the long-term outcomes, that the company wants to achieve;
- to identify mechanisms, to provide the resources needed to achieve these outcomes and to determine short-term goals for financial and non-financial criteria of BSC.

The benefit is also the improvement of the learning process (mainly due to the positive effects of teamwork on improving the communication among employees), improvement of the motivation of employees and improved feedback obtaining (BSC allows us to compare the desired performance goals with those reached so far and thereby measure the changes and BSC also is the subsequent balance factor for differences and serves for encouragement)[33].

Figure 16: Framework for transferring strategy into operational tasks *[33]*



From the perspective of process management BSC system and business models usage leads to the facilitation of their definition, the definition of performance measures and thus leads to a more efficient management.

6 MONITORING, MEASUREMENT AND PERFORMANCE IMPROVEMENT PROCESSES

6.1 Life cycle of the process

Performance Improvement in the global market currently applies to all companies. Because, in order to ensure the company's competitiveness, it is necessary to measure and monitor processes. Process development, just like the development of the market cannot be ignored, so it is essential to continuous improvement and adaptation process requirements of the company and customers. General development processes can be represented in seven basic stages that are influenced by four main elements:

- Market - the pace of market development, modification competition and changing customer requirements;
- Technology - the availability of new technologies and the development of substitutes;
- Life stage companies - development of organizational structures, together with the corporate culture;
- Limits - various resource constraints and regulatory restrictions.

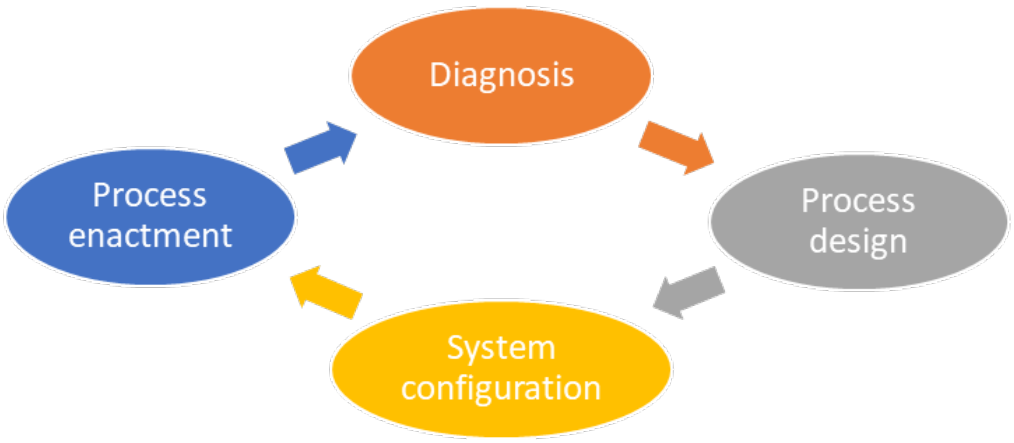
I properly set up a stable process with its established monitoring must undergo inspection and modification. Within process cycle is not considered piloting a new process experiencing, stabilization tuning process and anchoring in corporate culture [21]. All these steps include the design and the creation of processes that are separate areas associated with more innovations and reengineering.

In the paragraphs below various models aimed at the life cycle of a process, which were comprehensively characterized by Morais [44] and which are also the basis for the authors' model at the end of this chapter, are described.

One of the most important authors who deals with BPM (business process management) cycle is Van der Aalst [1], who divided it into 4 phases. The first phase is process design, which focuses on the correct understanding of the process within the organization and subsequent draft. The second phase is system configuration, which ensures control and correct process

flow. The third phase of the process is process enactment in the already established system and the last phase is diagnosis (control of the monitoring), which focuses on finding errors and opportunities for improvement. The entire process is cyclic as shown in the diagram below.

Figure 17: Van der Aalst's model [1]

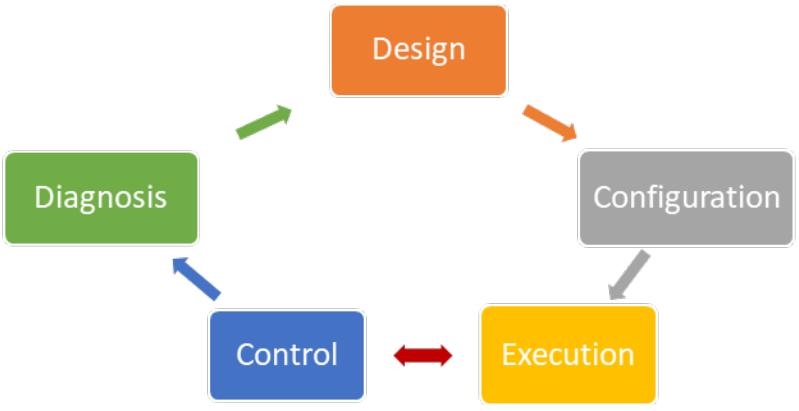


An interesting approach to the model of the life cycle is shown in the BPM resource center, which specializes in process optimization. Here is not like in other models of the main areas which will have to go through, but there are major issues on which the company has to respond during the upgrade process. Contrary to other models, this approach is based around main questions, which the company has to answer during the process innovation, instead of focusing on areas to go through. The first is the question concerning the description of the process: How is it done today? What are the different activities hiding under the process and what is its relation to other processes. The next phase is the question: Why do we do it that way? It is aimed at finding the causes and causalities associated with the process. As a sub-question the focus for improvement is present. Can we do it better? Or can we eliminate this activity, transform it, automate it? The third phase is: Fix it. This is where we are trying to find ways to improve the process, as well as improve various activities inside. Followed by a phase focused on the process monitoring and its changes, and if the desired results were actually achieved or not. The last phase is: More? This is where we discuss what else can be improved. The scheme is shown below [28].

Figure 18: BPM resource centre model [28]

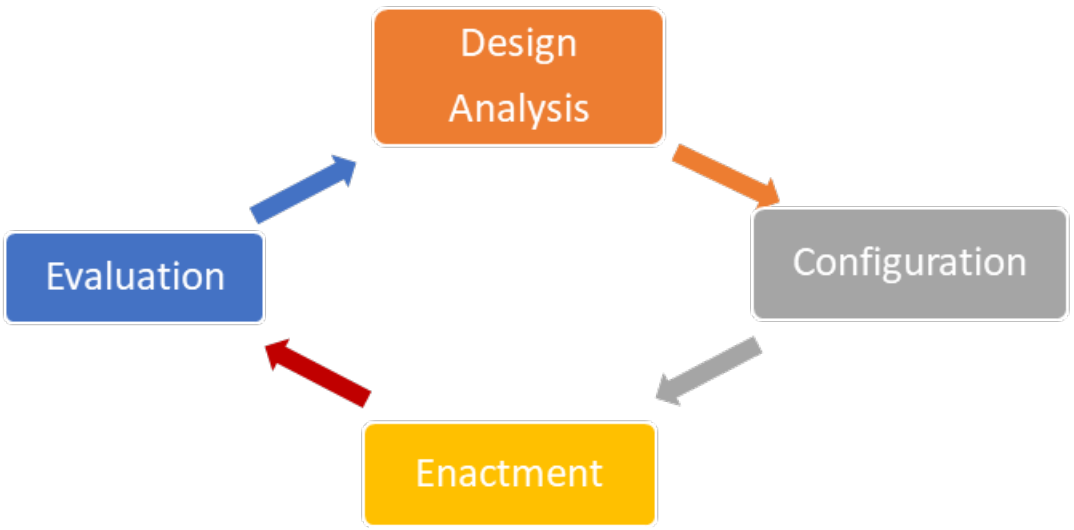
Another important model for the process life cycle is the model presented in 2006 by Netjes [49]. This model consists of five phases, the first of which is the actual process design, where the emphasis is on proper analysis of all involved and the resources needed for the process. This enables the team to make the appropriate simulation of the planned process and consequently debug many mistakes. The second phase is the configuration, where the emphasis is on selecting the right system for the functionality and performance of the process. The third phase is execution and as well as in the previous model, there is an emphasis on monitoring and configuration of work-flow. The penultimate stage is the control, which should provide sufficient information for possible improvements. There is also an interesting reverse between control and power, which gives space to incorporate errors. The last stage is the diagnosis important for future process improvement, mainly because of the identification of critical points within the process. The actual scheme is shown below.

Figure 19: Netjes model [49]



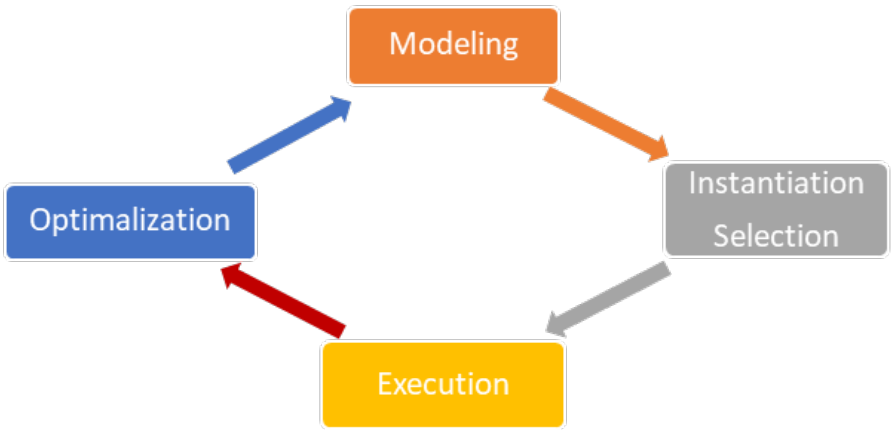
Weske [67] tied his model to the previous two models, in which he focused on four main phases of the process life cycle. The first phase is design analysis, in which the analysis of available information is included, also with the arrangement of their importance. Subsequently through simulation the design is created. The second phase is the configuration of process, which includes the right system configuration for process management and its implementation. The third phase like in the previous model is the actual enactment, in which the author fully agrees with Netjes [49]. The last is the evaluation aimed at monitoring and process performance monitoring. Model interest groups, together with the administration, are included inside, as shown in the figure below.

Figure 20: Weskes model *[67]*



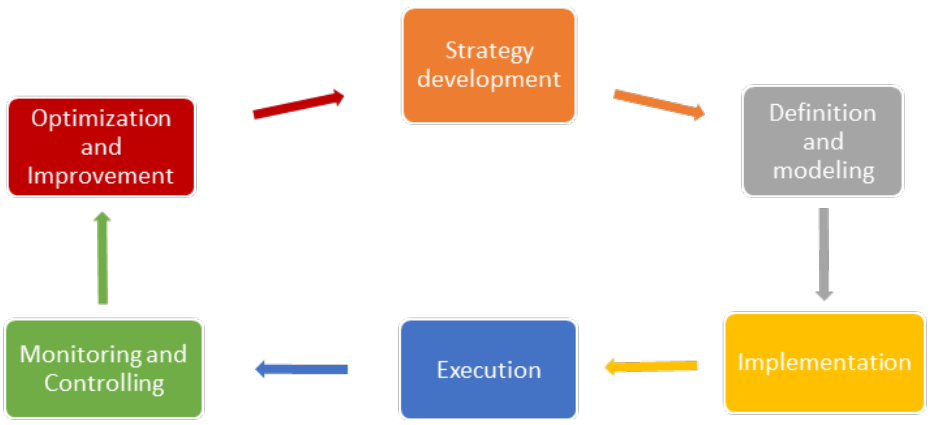
Another model is Hallerbach's model, which consists of four phases, where the first is the modelling and has a similar meaning as the design in previous models. Compared to previous models, the emphasis is on the proper selection from the proposed options and process configuration, ergo this step is devoted to one phase (Instantiation selection). The next phase is the execution of the business process and its monitoring. And the last phase is the optimization, which brings the whole cycle again to the first phase. As shown in the figure below.

Figure 21: Hallerbachs model [22]



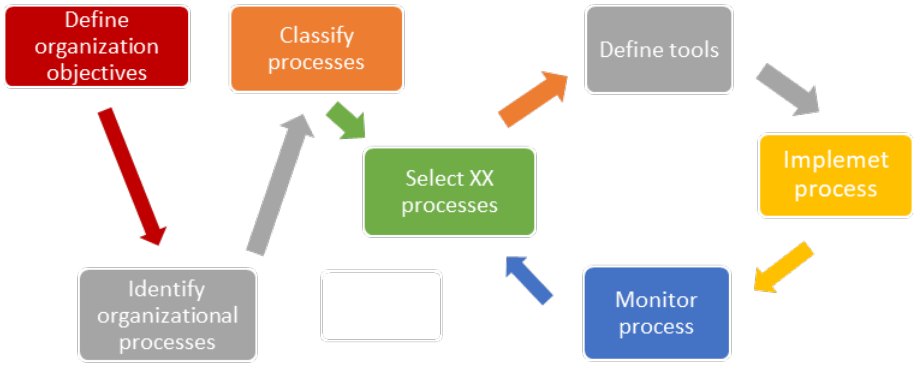
Another important author dealing with the model process life cycle is Houy [26], who described the cycle in six phases. The model is based on the strategy and its development, which builds on the proper definition of process and new process modeling. In the third phase the process is introduced into the company, then the stage called execution follows, which is identical to majority of the models, together with the phase of monitoring and controlling, where the emphasis is on the correct configuration of indicators, which should measure what we really want, without the possibility of this indicator to be bypassed by unwanted activities. The last stage is the optimization and improvement, which is emphasized in all models. This model is shown in the figure below.

Figure 22: Houys model [26]



Unconventionally conceived model is from Verma [65], which is not fully circular like the previous models, but the first three phases are independent. It is a specification of the company's objectives and analysis, from which then comes identification of processes, which are subsequently categorized and sorted by importance (key, major, minor, supporting) and then comes the cyclical phase in which the author deals with the process selection (here it often is the ratio between the importance of the process and its possible influence), proper definition of the tools for change, implementation of design changes to the process itself and monitoring of the process with benefit analysis. Diagram is shown in the figure below.

Figure 23: Vermas model *[65]*



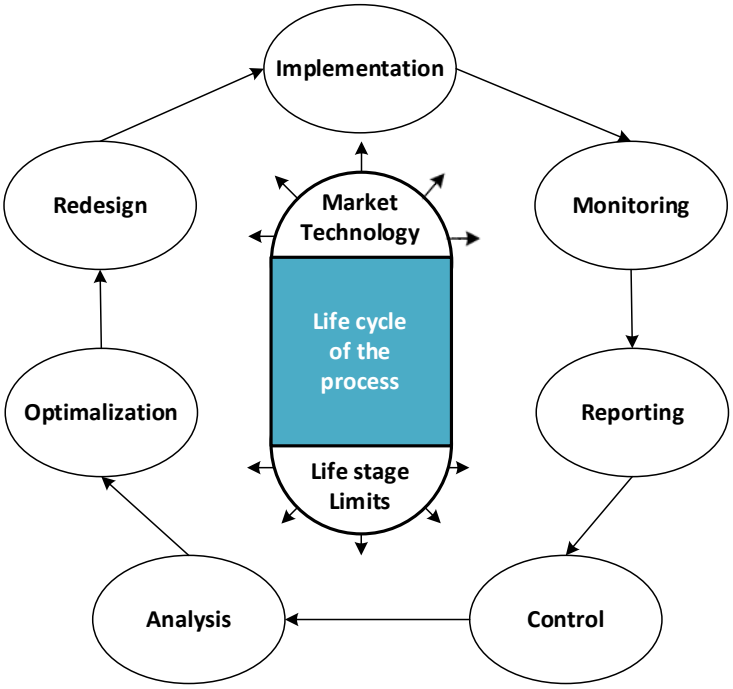
Summary of life cycle models was made by Morais in his work [44], who summarized a number of other authors. Enumeration of individual models is shown for easier orientation in the **Table 1**, where the columns represent the most significant authors dealing with process life cycles and each row represents the phases of these cycles. ¨

Table 1: Summary of individual views on the life cycle of the process *[44]*

	Authors						
Cycle steps BPM (ABPMP)	Hallerbach *et al.* (2008)	Netjes *et al.* (2006)	Houy *et al.* (2010)	Zur Muehlen and Ho (2006)	Van der Aalst (2004a)	Verma (2009)	Weske (2007)
Planning and strategy			Development of strategy	Specification of objectives and analysis of environment		Define objectives	Administration and Stakeholders
Analysis		Design	Definition and Modeling	Design	Design	Identify process	Design and Analysis
Design and modeling	Modeling	Configuration	Implementation	Implementation	Configuration	Classify Process	Configuration
Implementation	Frequency and Selection	Execution	Execution	Monitoring	Execution	Choose process	Operation
Monitoring and control	Execution and monitoring	Control	Monitoring and control	Evaluation	Diagnosis	Define tool and implement process	Performance Evaluation
Refining	Optimization	Diagnosis	Optimization and Improvement			Monitor process	

In terms of individual phases of the process (**Figure 24**), the first phase mark already created a new process, which emerged from the preceding version of the process, or be formed directly within the business process reengineering, as part of the newly designed system's operations. It is precisely defined, are with him set monitoring indicators, process owner, current status, priority, etc.

Figure 24: Life cycle of the process



Monitoring, as well as periodic reporting on the results, in most companies is ensured through spreadsheets associated with monitoring software (Aris BPM, Concorde), which in addition to monitoring, compared with previous versions (the first and second stage of the development of ICT for businesses) can work systems for modeling and editing processes across the organization. Such software infrastructure known as workflow and are currently the most widespread in SMEs. In terms of ICT development-oriented processes and monitoring (ERP) exists for larger, typically multinational companies, the fourth developmental stage (BPMS - Business Process Management Systems), which in addition to the aforementioned features multiple database systems, which can be in real time to compare with actual data acquired companies. This approach is known as business mashups. Monitoring, in contrast to reporting regularly performed and recorded his ordinary

employees. Reporting is done by setting process, weekly, monthly, or quarterly, and is conducted by a person responsible for fulfilling the objectives of the process.

Within the reporting it is necessary so as not exported only data, but to date, which in most cases deviate eg. By more than 10% of normal, provided a brief commentary ordinary employees (illness, vacation, error at the supplier, etc.). Controlling is ongoing in relation to other processes and is performed by a manager who assesses the individual processes within their organizational unit. If at this stage the process parameters deviating from the planned values, is a team (usually 3 membered) creation of a detailed analysis is intended to detect any discrepancies and suggest possible optimization process. The subsequent optimization process should be approved by a manager, and there should be a redesign process. At this stage of the cycle and closing occurs again for the introduction of the modified process.

A key prerequisite is a correct definition of the problematic activity in the process. This is often based on the method called Bottleneck, which in the context of BPM (Business Process Management) says that the process is as fast as its slowest part. The second used method is the fishbone diagram (Ishikawa diagram), which helps to pinpoint the causes and consequences and often also to correctly define the weak part of the process. Consequently, there is a search for a solution, when the team often gets from transparent, simplex solutions to methods of idea generation and finding creative, comprehensive solutions.

The subsequent optimization of the process should be approved by the manager on the basis of generated designs solved beforehand by a team. Here the teams often provide comprehensive designs, including not only the solution itself, but also the expected benefits of the options and costs associated with their implementation. Manager often decides based on their own experiences, or can prospectively choose any method of analysis for the decision. In terms of costs and benefits the cost-benefit analysis (CBA) is often used. Based on the chosen solution the perfect simulation, or a digital twin if you will, of the entire process and of its debugging is often used in modern companies with Industry 4.0. On the other hand most of the other companies allows the proposed solution to be opposed by the employees involved in the process, which leads to some minor changes.

In the redesign of the process, the original process is already modified and ready for its introduction. This is where the cycle ends and forms, on the basis of monitoring and reporting, space to find another weak point.

6.2 Monitoring

Individual processes is important to monitor, but also at individual indicators need to respect the principle of a maximum of 20 scales within a single department, hence one of the main process to avoid flooding personnel administration. In most cases, the monitoring process uses specialized software that helps in benchmarking, modeling and historical reports. For businesses that do not use specialized software and work mostly with shared spreadsheet, it is necessary to define the card separately and subsequently set benchmarks calculations and linking source and output documents. The general content of each process cards for the process is shown in **Figure 25**.

Figure 25: Process card

Name	**Sales representatives**			**State: R 111%**			**Price: G 50%**	
Code	P-012			**Priority (1-5)**			3	
Description	Monitoring the performance of individual sales representatives							
Part of the processes	Business Processes							
Sub-processes	Receipt of orders, complaints, new customers, customer satisfaction							
Risks	Seasonal fluctuations, new trends, competitive offers, human factor							
Expands	Sales network, Partner network, Brand awareness							
Collaborating projects and entities	Marketing campaign "Summer" Modernization of the fleet							
Scales								
Destription	*State*	*Current value*	*Perfor-mance*	*Optimal value*	*Permissible deviation*	*Weigh t*	*The last period*	*Frequency*
Number of newly contacted partners	R	6,0	75%	8	20%	20%	7,8	týdně
	A brief justification for any deviation							
Sales volume	G	1200	120%	1	20%	60%	1100	týdně
	Stručné zdůvodnění případného odchýlení							
Costs	G	6000	50%	4000	10%	-	3200	týdně
	A brief justification for any deviation							
Sales volume from newly ranked customers	G	60	120%	50	10%	20%	62	týdně
	A brief justification for any deviation							
Person responsible for the measurement				Sales Representative of ČB				
The person responsible for the process				Sales Representative of JČ				
Process edit date				1.1.2017				
Record date		2.4.2018		**Date of control**			14.4.2018	

The header processing cards is a brief name and code name that is used for easier orientation within the system. At the same time there should be noted the current status of filling process, which is usually expressed in terms of percent, or a different color. Green indicates the manager that everything is working properly, orange indicates a negative deviation of the derogation, which is defined by the individual scales. The red color indicates a troubled operation process. Some companies use a wider color range and to increase process performance, stopping the process, etc. An important indicator that tracks the manager, the direct costs of the process, which is one of the major scales and are often separately isolated from each other because of the other metrics.

There follows a brief description of the process and defining the processes and procedures parent. In some processes are also briefly described the risks posed by this project, along with extensions that represent activities and activities related positively to the functioning of the process. Within detailed description are listed for each process in the Process tab also cooperating entities and projects where the activities and entities that are linked to this process.

An important part of the process cards are standard. According to the practice recommended process to follow only one measure to avoid misrepresentation, aimed in one direction only. Optimal is a possibility of color scale resolution state that the manager did not have all the data difficult to read. The following are the actual data that is entered into the system, the person responsible for measurement. Then automatically adds the percentage level of performance indicator based on the optimal value. Due to the large variability metrics and relatively complicated compliance value is accurate at scales tolerance. At the same time, there is given the weight of the individual measures, because different data tend to have a different priority for the process. Based on the percentage of performance and weight scale is determined by the overall performance of the process. Scale are sometimes even extended to data from previous reporting periods, or by monitoring the frequency, if the frequency is not determined, the general regulation. Furthermore, for each scale space for a brief justification for deviations, for example due to illness, delayed deliveries, incorporation etc.

The last part of the process for card indicates the person responsible for the measure, while the person responsible for the process. It also identified potential data checks that are in paper versions signed, together with the date of the most recent changes in the process.

6.3 Indicators KPI, KRI, CSFs

The actual monitoring can be divided into two types according monitored preachers, which are the KPI (Key Performance Indicators) and KRI (key result indicators). The difference between these groups of indicators over time increasingly blurred, as the time needed to assess key indicators of the result after the process is constantly shortened and therefore in most cases get the latest economic data still easier.

KRI can have both financial and non-financial character, and are measured at regular intervals (annually, quarterly, monthly). They also do not record the results of only one activity or activities of one working team, but they instead summarize the sub-indicators into more complex units that form the main results. The main disadvantage of those main outcomes is often their complicated decryption. Other disadvantages include slow response of these indicators to the current changes in the company, making it extremely difficult to radically alter their value in a short period of time. Contrary to this the KRI are among the most popular indicators for the shareholders.

KPIs are measured in shorter intervals than KRI (daily, weekly, monthly, quarterly), and are primarily focused on non-financial indicators of individual processes, projects and activities of individual teams. Their main advantages are the simplicity and ease of understanding for individual employees and they lead to greater motivation to fulfil the indicators. On the other hand if not properly set, they can displace targeted behaviour of employees at the cost of circumvention practices in order to improve indicators. Another advantages are their topicality, they quickly respond to changes and thus increase the commitment and positive approach to change.

Compared to the aforementioned indicators, the CSFs, or even KRAs (key result area) and KSFs (key success factor), are expected to comply with the main objective of the company and its vision and mission. It often consists of one to three factors thus defined. Their main disadvantage is their complicated measurement and determination of current status, ergo they are often simply referred to as completed x uncompleted.

Much more and more popular are the KPIs. With increasing efforts to measure more and more detailed processes we must not forget the classic "Twenty is plenty." In terms of individual processes it is recommended to implement such a number of indicators, which can secure the necessary overview of the entire operation of key processes and which simultaneously does not significantly increase the routine activity of individual employees.

In addition to the importance of KPIs for process and company management, the KPIs also have secondary importance of verifying the correctness of previous decisions, of justifying the correctness of previous decisions and ultimately helping us determine the point suitable for correction and corrective actions. KPIs are often divided into different areas, where in addition to the financial sector, the other sectors are the costumers, marketing and sales, operational process and employee. The corporate social responsibility is also often mentioned.

For the needs of publication KPIs from fields of operational process and supply chain perspectives will be selected. These indicators are used for all projects, regardless of the field of company businesses. The most often used method is EVM (Earned Value Management), which enables comprehensive look at the cost side of project management, the costs associated with its development, current status, future development, and related predictors that allow cost optimization, risk minimization and cost reduction during development with clear possibility of their remuneration. The following indicators, when compared with each other, indicate a comprehensive overview of the project [17].

Primary indicators:

- PV (Planned value): this is a financial measure of the planned output of the project, which should be done at the current moment. In the eighties the term "budget cost of work scheduled" was used. You can visualize it as the sum of what should be done at the moment.
- EV (Earned Value) is a financial measure of the planned output of the project, which was actually done at the current moment. In the eighties, when this methodology was used in US government agencies, this term was commonly replaced by: "budget cost of work performed". We can define it as what is actually done at a given time.

- AC (actual cost) actually spent costs to the current moment.

One of the secondary indicators that is formed by a combination of the aforementioned values, is also the cost variance (CV), which is calculated as the difference between earned value (EV) and actual cost (AC). It represents the difference between the actually created value of the project and spent costs. Statistical research shows that 70% of the projects exceed their costs and more than 52% of the projects end with a twofold increase of budget. For this reason, regular monitoring of KPI is important. In terms of frequency it mainly depends on the size of the project. Monthly tracking is the average frequency for the projects. The advantage of this type of indicator is, that the data are usually downloaded automatically either directly from specialized planning software, or from a combination of the plan and accounting software. If the CV is greater than 0, the project is fine, although we can assume an unnecessary creation of reserves and poor project planning. If the CV is less than 0, in terms of costs the overrun of budget happened and we need to look for the reasons for the deviation (poor planning, emergency situation). Either way beyond the financial aspect, projects should always be evaluated also in terms of quality and time. Other secondary indicators we can include:

- CPI = EV / AC (cost performance index)
  - This is a ratio indicator similar to the CV
  - If the resulting value is greater than or equal to 1, everything is as it should be. If it reaches values below 1, budget will be exceeded.
- SV = EV - PV (schedule variance)
  - This is an indicator, which tracks the difference between the actually created value and the plan.
  - In the event that we achieve positive values, the project is in optimal condition. In the case of negative values delays in terms of work occur (planned value is greater than actually generated one).
- SPI = EV / PV (schedule performance index)
  - Like the CPI and SPI it is a ratio index doubling the SV,
  - If it goes into values greater than 1, the project is in the norm. For projects reaching values of less than 1 a delay occurs.

- BAC (budget at completion) represents the total planned costs of the project at the beginning of this project.
- ETC (estimate to complete) this is an estimate of costs that will have to be spent in order to complete the project.
- EAC = AC + ETC (estimate at completion) estimated costs at the end of the project, carried out during the project implementation.
- PC = EV / BAC (percent complete) the percent representation of the amount of work done on the project.

TCPI = (BAC - EV) / (EAC - AC) (to complete performance index) expresses the ratio between remaining work and remaining costs, in other words, whether we have enough resources to complete the project objectives. If we reach values higher than one, compliance with the budget is unrealistic

7 CHANGE MANAGEMENT

We live in a world, where it is important to put pressure on continuous improvement through change. We include here some new methods of management and technology improvements that will help us stay ahead of the competition - these things keep coming so it is important to manage the process of the whole change. In the process of change it is necessary to build a good plan of change and then successfully carry it out with all the necessary resources of the organization. One of the biggest risks of the process of change, that might jeopardize the whole existence of the organization, is the resistance to change itself [53].

Change management is a procedural matter. Some people and companies cope with the change management much better than others. Companies that are successful at managing the change, have an advantage over other companies and their competitiveness is increased. The company should not wait to be forced to make a change, but it should find the appropriate moment, when to make the change. Managing changes is one of the key challenges for managers and executives. Regardless of their size or lifespan every company currently has to undergo the process of change to maintain its viability [2]. As Veber [64] mentioned, it depends on the managers, on how to cope with the existence of changes and whether they can be used for the benefit of the company or can even be consciously developed. To achieve visible effects the organization needs to manage the process of preparation and implementation of changes well, because they cannot simply rely on the development of spontaneous changes and the initiative of employees, regardless if the changes are unexpected or initiated. If the risk of a change and the risk of changelessness reach the same level or if the organization or individual enters the so-called bifurcation point or a point of decoupling if you will (see **Figure 26**).

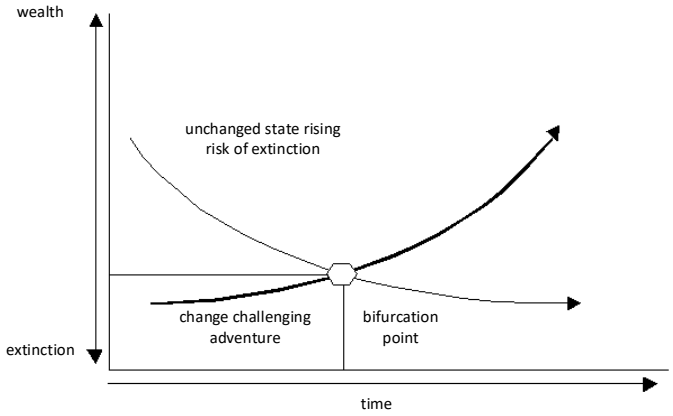
At this point, management must consider the following facts:

1) To implement the change, because change is less dangerous for the future or even more promising than the unchanging state.

2) Not to implement the change, because the change is risky in the given moment, while the constancy represents certainty.

Generally, it is possible to say that delaying changes in bifurcation point is convenient in the short term, but in the long run it may mean demise [34].

Figure 26: Bifurcation point of change [34]



The Change Management Process is the key to successful change. Understanding and following the process guarantee success in any personal or business change people choose to manage. All too often, people involved or affected by change don't have a clear understanding of what's happening. The fail to see where they are, where they are going, and when the transformation will be complete. That's a recipe for disappointment [42]. This is the reason, why this process really requires a clear communication plan including key messages, relevant communication channels, appropriate media types, e.g. newsletter, Intranet, platforms, frequent contact, binding time schedules and the possibility for feedback. This allows for the involvement of all employees, ensures a high quality of change and increases the level of acceptance [56].

Before starting the process of change, the following questions should be answered:

- HOW does the desired state, which the company wants to achieve, look like? - At the beginning of the process the desired future state must be clear.
- WHAT are these factors, HOW intense are they? - Any change is triggered by certain factors.
- WHO will support it, WHO will boycott it? - The process of change is carried out by people, so it must be known who will support the process and who will boycott it.
- WHERE will the intervention happen? - During the whole process, some of the company's systems will be influenced by (e.g. interference in the organization, human resource management etc.).

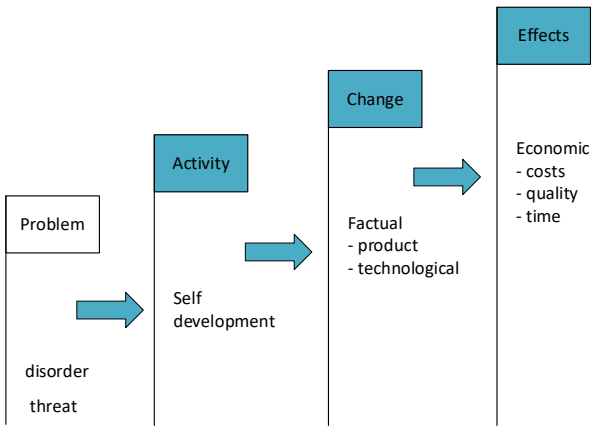
- HOW to make this intervention? - The proposed action must be implemented in a certain way.
- HOW did the process end? - The results must be evaluated and conclusions must be drawn [36].

7.1 Process of change phases

Process of change can include several steps. It is important to know what kind of change it is and what information and knowledge on the issue we have. This is related to whether we have carried out such a change in the past, whether it was successful or unsuccessful, what will cause the change, how will the employees perceive the change, what techniques will we use for the introduction of the change and which internal and external forces can influence the change [3].

The very process of change can be divided into several steps. The purpose of this division is to divide the entire complex process into separate smaller sections, which can then be cared for separately and sequentially [24]. The general principle of change management is provided in the following **Figure 27**.

Figure 27: The principle of change management [64]



Change management process consists of the following sub-stages:

1. Defining, resp. redefining the target state of a company before starting its own process of change.
2. Analytical stage.
3. Design stage, the core of which is the creation of a model of the change.

4. Determination of the change agent.
5. Determination of the individual processes of the company (subsystems), which will be affected by the planned change.
6. Implementation stage.
7. Feedback based evaluation of the performed change.
8. Modification resp. freezing of the current process of change [36].

The whole procedure of the process of change in society can be, according to Vaculík[63], divided into several consecutive phases.

1. Identification of the need for the change.
2. Determination to make the change.
3. Processing the design of the change.
4. Implementation of actions to cause the change.
5. Fixing the new state.
6. Evaluating the achieved change.

Within the ISO 10007 standard (Guidelines Configuration Management) the process of change management is quite generally defined in three stages [10]:

1. Stage 1 - Identification of changes:
    - Impetus for the change or the need for the change - customer request, entry into force of standards, laws, directives etc.
    - Preparation and submission of a request for the change - the answer to the question "WHAT, WHICH criteria and possibly WHY?"
    - Analysis of the change - processing the options and selection of optimal variant
    - Approval or disapproval of the change.
2. Stage 2 - Implementation of the approved changes:
    - Introduction of the change
    - Monitoring the change.
3. Stage 3 - termination:
    - Evaluation of changes
    - Conclusion.

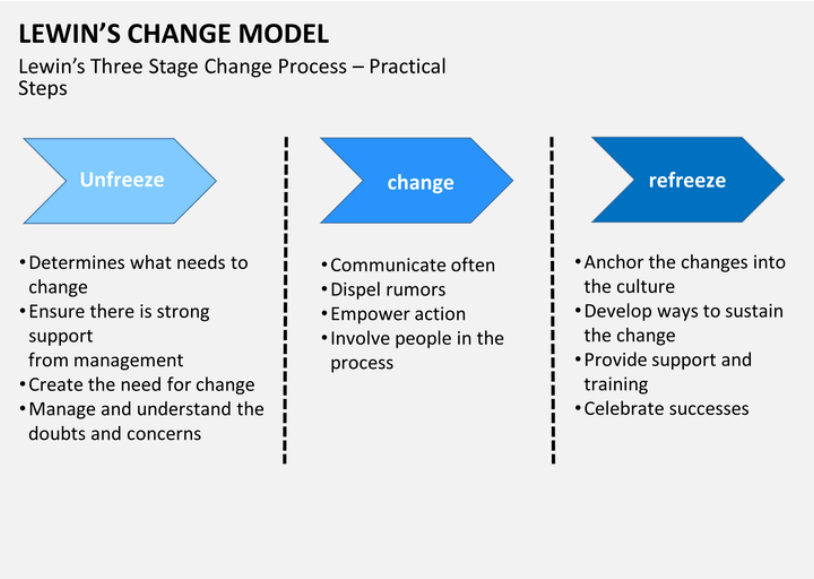
7.2 Models of the process of change

To enhance the success of the change management many models were, and constantly are, developed. They have much in common, consist of different phases, which often overlap. Each of them, however, was designed for a different situation in the organization and its environment. Each process of change is simply unique and to find a universal and unified approach is almost impossible.

Lewin's three-phase model of changes

Work of Kurt Lewin has controlled the theory and practice of change management for more than forty years. Lewin's most cited work is his contribution to organizational changes known as the three-tier model [43]. His model symbolizes the change in three steps [41]. Despite its simplicity the Lewin's three-phase model of changes is really elegant and practical (**Figure 28**). It is helpful in solving complex and sometimes confusing issues arising from the process of change [40]. This model is based on the principle, that change requires a shift from a previous state, through the state of activity, to the current static status [63].

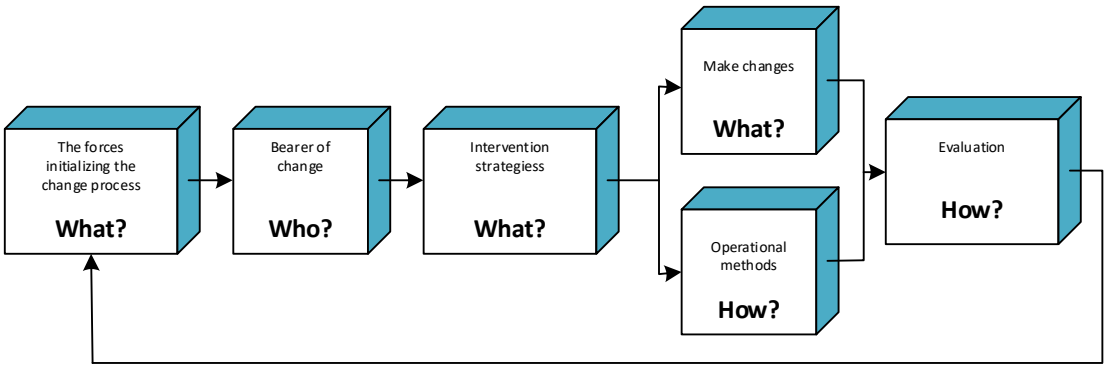
Figure 28: Lewin's change model



Lewin pointed out that each of those three phases are governed by their own issues and problems [16]. Changing the behaviour of an individual in isolation should not result in a change in the behaviour of the whole group. Effort to encourage changes should be directed to the group, since only in it the effort leads to interaction and socialization processes [5].

Besides the determination of individual activities, which needs to be made in the context of changes, correct timing and proper alignment of activities is important. Phases of change management in the company (questions, which you need to find the answers for) are essentially the steps in Lewin's model [59] (see **Figure 29**).

Figure 29: Lewin's model of controlled change [59]



According to Lewin the process of implementation of successful change thus consists of three phases:

1) Unfreezing the current level / situation, sometimes also called preparation for the change,

2) Transition to a different level (phase of change),

3) Freezing the new level (fixation or freezing the change) [63].

Kotter's 8-Step Change Model

John Paul Kotter is a major Harvard professor who is considered the foremost expert in the field of change management. The eight steps describe operations that are essential for organizations to successfully make a change. Kotter´s model is one of those models that emphasize the logical sequence of activities, which can help with a successful organizational change [35]. Great emphasis is placed on the fact, that if one of the given steps is skipped, it should bring serious consequences for the organization. Based on the analysis of successful and unsuccessful efforts for change in varying organizations Kotter emphasizes, that during

the implementation of the process of change its management is very important [48]. Prerequisite for a successful change and for implementation of Kotter's model is adaptable management with the ability to change and adapt according to needs [58].

The model is strategically focused and is designed to help managers to avoid mistakes when implementing a change. Two key findings of the model is that the change goes through a series of phases, each of which takes time and critical errors in these stages can have a negative impact on the dynamics of change [38].

The model addresses some of the performance issues, which occur, when you make changes. It also highlights the importance of feeling the need for change in the organization and stresses the need to communicate about the vision and to maintain an extremely high level of communication throughout the process of change [6]. The individual steps of the process of change will, therefore, focus on targeted communication with employees, so that the process of change can go smoothly, and so staff can be maximally involved in the changes [12].

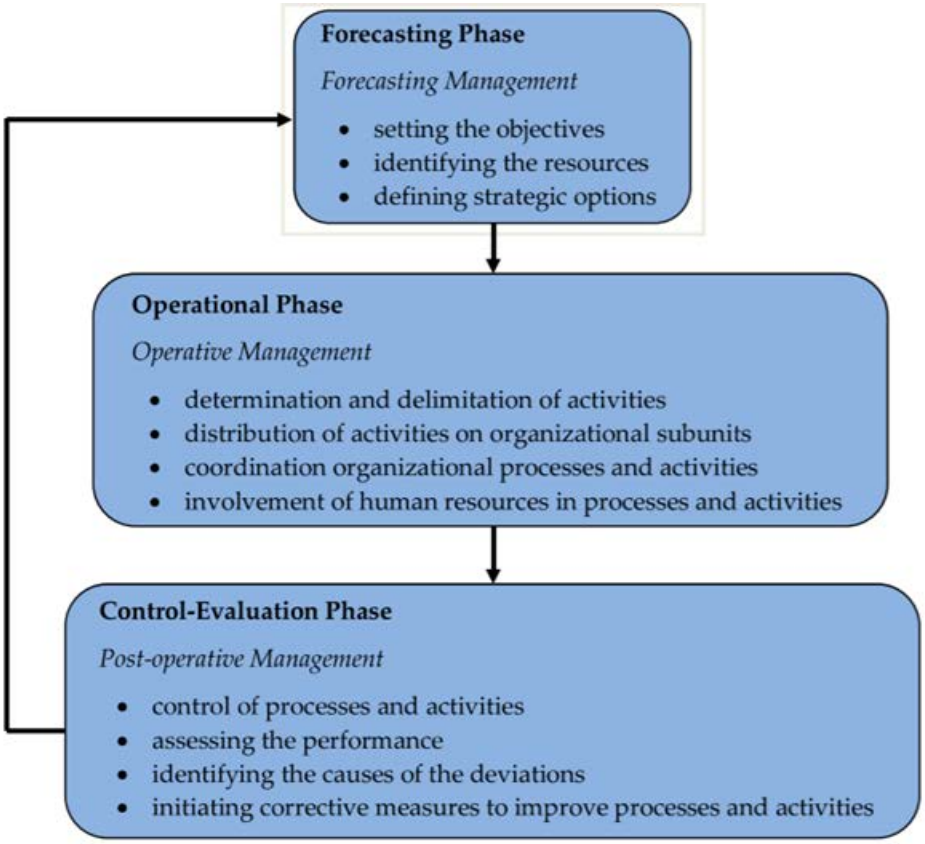
For the change to be carried out certain conditions must be established. John Kotter defines the basic steps of change in his model - see **Figure 30**.

Figure 30: Kotter's 8-Step Change Model

Change management process model

The other authors Ionescu Vladimir-Codrin & Cristina Bolcas [30] come up with a little bit different Change Management Process Model, but the key message is still the same as previous model has. This model consists of three phases – forecasting, operational and final measurement and interpretation of results. The model is captured in **Figure 31**.

Figure 31: Change Management Process Model [30]



The first phase, in which a **forecasting management** is manifested, involves setting the objectives, identifying the resources and defining strategic options through which the objectives can be achieved, given the resources of the organization.

The **Operational phase** of the change management process, in which an operative management is carried out, includes four steps:

1. Determination and delimitation of activities

2. Distribution of activities on organizational subunits
3. Coordination organizational processes and activities
4. Involvement of human resources in processes and activities.

The third **Control-Evaluation phase**, the measurement and interpretation of results, in which management is post-operative, essentially consists of:

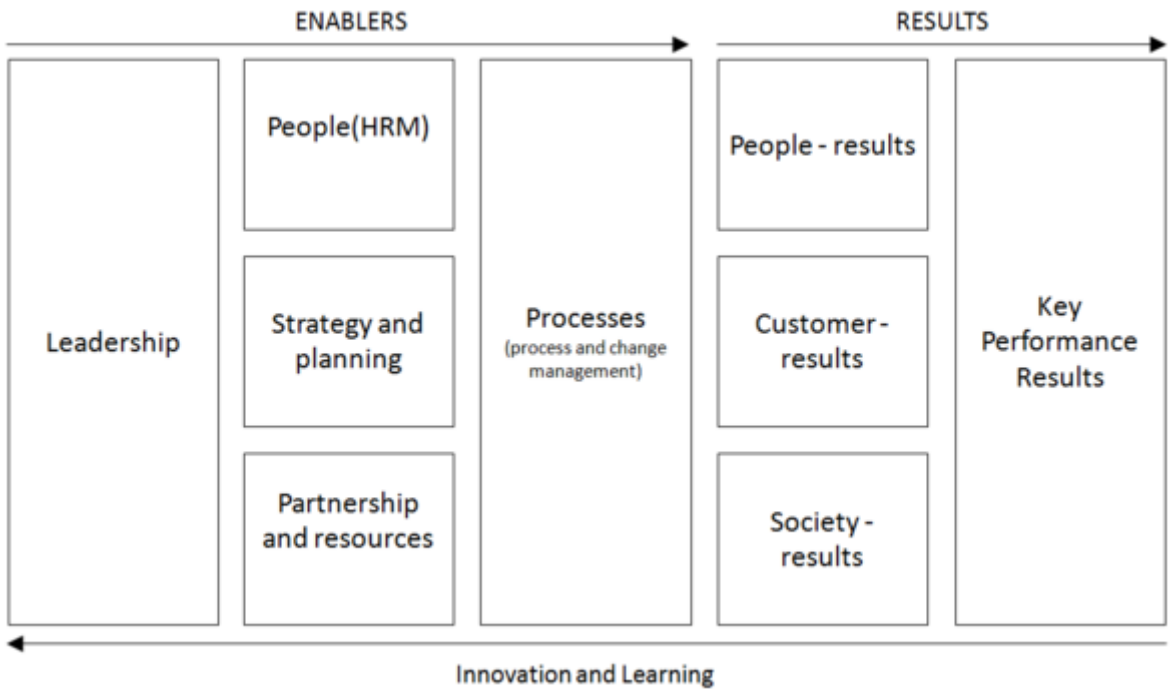
1. Control of processes and activities
2. Assessing the performance by comparison with the level of forecast objectives
3. Identifying the causes of the deviations
4. Initiating corrective measures to improve processes and activities in the next managerial cycle [30].

Model EFQM

The objective of the EFQM model changes must be the achievement of a pre-defined goal, we must, therefore, be successful in implementing the change [36]. The quality of the change management process in the organization and their successful implementation are one of the basic criteria for success measurement of the company. Ability to effectively and purposefully manage change is among the most important managerial skills. The European Foundation Quality Management (EFQM), founded in 1988 by European companies (e.g. German VW, Italian Olivetti, Swedish Electrolux), was significantly involved in the creation of the EFQM excellence model for company management. The model is thus a tool for company management. This does not concern the management of production quality, but attention is mostly given to the quality management and performance of the company [59]. The model is based on nine criteria. It discovers areas that could be improved within the organization and provides the basic framework for the managerial system in the company. The model shows the relationship between predictions and results, or in other words the criteria that make up each region [4]. It helps the organization achieve long-term benefits and identify areas for improvement and achievement of stated objectives [15]. **Figure 32** shows the structure of the EFQM model and the relationship between the elements of the quality system. These

elements and their assessment are annually reviewed in the process of continuous improvement. This versatile model can be used e.g. as a tool for self-assessment or evaluation of third parties, like using it as the basis for applying for the European Quality Award [39].

Figure 32: EFQM Excellence Model



Lang [39] reported that a total of five components in the model form prerequisites for the company's results. These are:

- Leadership - includes procedures, on how should executives develop and implement a vision, articulate the values for a long-term success of the organization, and then implement these in practice.
- People - a measure that is used to develop the knowledge and the potential of employees at all levels of the organization.
- Policy & Strategy - includes procedures that are aimed at defining a strategy of organization focused on interested parties.
- Partnerships & Resources - how the organization utilizes partnerships and internal resources.
- Processes - how the organization improves and designs processes. The aim is to provide an increasing value for consumers.

The results provide information about which goals did the organization achieve.

- Employee satisfaction (people results) - what does the organization do for the satisfaction of their employees.
- Customer satisfaction (customer results) - what does the organization do for the satisfaction of its external customers.
- Society results - society evaluates the organization in terms of its approach to quality of life, protection of the environment and the preservation of global resources.
- Financial results (key performance results) - this criterion compares planned and actual results of the organization [39].

7.3 Reengineering

We understand the concept of reengineering radical change or re-evaluation system, so that there has been a significant shift in the quality or performance of the company, mostly due to the introduction of new services, improve customer relationships, introducing a new product or cost reduction. Companies that opted for reengineering can be divided into three groups. The first group can be thought of as the passengers who had just crashed into the wall. Such companies to stay in business, has no other option than to take a radical change in processes and systems. Their behaviour often ends unsuccessfully since late responded to market changes, such as. Kodak. The second group includes companies where the crew is already on the horizon to see the wall and management decides for reengineering, which in most cases is successful, e. g. Dell. The last group consists of companies that are forced to reengineering the market, but as the crew of the car they decide to slow down and build a wall, thereby greatly complaint conditions competition. This is a typical example Apple.

Generally reengineering divided into three levels. The most important is the total business reengineering (TBR), which affects not just the organization that it performs, but also the entire market, with emphasis on the supplier and then over the customer also competition. The next level is the business process reengineering (BPR). These are changes that affect the entire enterprise, the main products relate to them and set processes, adapting organizational structure. The last work process reengineering (WPR). This is the most common type of

reengineering especially for SMEs, where there is a change only part of the company. In the last period of this last type of reengineering focuses primarily on administration and gradual transition to electronic communication and administration.

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