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A generic method for KPI design in organizations

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ABSTRACT

Introducing a dashboard or a scorecard system in an organization is a complex process that requires a number of design tasks to be carried out. The main task is to design the Key Performance Indicators (KPIs), which are the metrics used for measuring the performance of the organization. However, existing methods for designing KPIs are not easy to use for practitioners; their explanations of how to design KPIs are hard to apply and/or understand. Therefore, the research question of the thesis is: How a method for KPI design should be designed to be practically useful for an organization which aims to introduce a dashboard or scorecard system for measuring their organizational performance? The thesis presents a method for designing KPIs for practitioners. The method aims to fulfill the following requirements: it should be independence from business domain; precise and easy to understand; it should provide a step-by-step description of how to design KPIs; and independence from experts in performance management so that practitioner can use it without having much knowledge in this area. The utilized approach in this study is design science, which is characterized by the creation of artifacts (i.e. constructs, models, methods and IT systems) for addressing problems in a business setting. The method was designed based on earlier research (by combining and comparing the existing guidelines), and by obtaining experienced opinions through discussion with focus group (a group of people which are expert in this area). The method is demonstrated using a real-life case study, and evaluated by interviewing practitioners with experience of designing KPIs as well as using so called informed arguments..

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ABBREVIATIONS

- BI - Business Intelligence
- BSC - Balanced Scorecard
- PI - Performance Indicators
- SF – Success Factor
- CSF - Critical Success Factor
- KPI - Key Performance Indicator
- PD - Performance Dashboards
- DSS - Decision Support Systems
- OLAP - Online Analytical Processing
- MIS - Management Information System
- FG – Focus Group
- PM – Performance Management

1. INTRODUCTION

This chapter gives the general background of the thesis as well as addressed problem and a research question. This chapter also specifies the objectives of the proposed method for designing Key Performance Indicators.

1.1. Background research

Business intelligence (BI) is a popularized term introduced by Horward Dresner of the Gartner group in 1989 to describe a broad category of technologies for gathering, storing, analyzing and presenting data to support employees of an organization to make better business decisions [24]. Examples of such technologies are data warehousing, data mining, OLAP tools, dashboards and scorecard systems. Nic Smith stated in his research that “business intelligence platform puts the right information in the right hands at the right time” [8].

Two types of BI systems are dashboard and scorecard systems, both are in the focus of this thesis. Dashboard and scorecard systems aim at measuring the performance of organizations as well as visualize the result of the performance using gauges, maps, charts and other graphical elements. These graphical presentations help decision makers to receive a direct and clear picture of an organization’s performance and how it is related to the goals and objectives of the organization, Thereby, such systems can support decision making on strategic, tactical and operational levels [2, 19]. In general, scorecard systems aim to support decision making on the strategic level, while dashboard systems aim to support decision making on the tactical and operational levels [2].

However, introducing a dashboard or a scorecard system in an organization is a complex process that requires a number of design tasks to be carried out [2]. First, goals and objectives of the organization need to be specified in order to design an effective dashboard or scorecard system. Second, the core activities in the business processes need to be specified in order to know which activities to measure. Third, IT architecture for the dashboard or a scorecard system needs to be specified in order to efficiently make use of IT to carry out the measurement, as well as to do the transfer of the result of the measurement to the dashboard or scorecard system. Fourth, the graphical interfaces of the dashboard or scorecard system need to be specified in order to support the users of the systems. Finally, new tasks for groups and individual employees using the systems need to be specified. The latter is important since

effective dashboard and scorecard systems require supporting processes around the usage of the systems [2].

In the center of the design tasks presented above are the design of the metrics or indicators. These metrics or indicators are usually called “Key Performance Indicators” (KPIs) [2]. The designed KPIs should operationalize the goals and objectives of the organization so that they can be measurable. The designed KPIs should specify what to measure in the organization and, thereby, which data that are needed. This will be the base for the design of the IT architecture feeding the dashboard or scorecard system with data from existing IT system. KPIs are also the core element on the dashboard and scorecard systems’ screens on which the design of the graphical interface of the dashboard and scorecard systems are based. Therefore, designing KPIs is a main task when designing and introducing dashboard and scorecard systems in an organization.

1.2.Problem identification and motivation

Designing KPIs means identifying, specifying and selecting KPIs. It is a complex process since KPIs need to be related to the organizations goals, objectives and strategies to govern the organization in the right direction. If the KPIs are not related to the goals, objectives and strategies, there is a risk that the KPIs are sub-optimizing the organizations performance. Therefore organization needs to identify which business processes and activities in the processes need to be measured. The relation between the KPIs and business processes required to specify which data in the processes are needed for the measurement. Finally, the process of designing KPIs needs to involve different stakeholders in an organization in order to make use of their experiences and domain knowledge in the design process. Thereby, the designed KPI will be based on actual domain knowledge.

Most of existing methods for designing KPIs are fulfilling the needs mentioned above. However, they are not easy to use for practitioners. This statement is based on our experiences with practitioners in an organization in which we have designed KPIs, see chapter 4, 5 and 6. The statement is also based on a literature analysis of existing methods and guidelines for defining and measuring KPIs. The analysis is described in Chapter 3. The result from the analysis shows the following: First, the flow of steps in existing methods for designing KPIs is described in a very generic way. The users of the methods need to add additional steps by themselves to make use of the method in practice. Second, the steps themselves in existing methods are not always easy to understand because the descriptions of the steps

are unclear, that is, the descriptions are not precise and understandable enough, Third, the stated guidelines used in these methods are very generic as well, thereby, not providing detailed support for designing KPIs.

Since existing methods for designing KPIs are not easy to use for practitioners, there is a risk that non-effective KPIs will be designed. Furthermore, there is a risk that organizations will be dependent on performance management consultants, which can be expensive to hire, especially for small and medium sized organizations. This can lower the adoption level of dashboard and scorecard system in organizations. An easy-to-use method for designing KPIs can be more efficient since it targets vaster number of practitioners in organizations.

1.3. Research Question

The research question of this thesis is:

How a KPI design method should be proposed to be practically useful for an organization which aims to introduce a dashboard or scorecard system for measuring their organizational performance?

1.4.Objectives of the solution

Each method for designing KPIs aims at fulfilling certain requirements or objectives. The method presented in this thesis aims to fulfill the following objectives:

- **Generic**

The method should be independent of business domain, department and organization. The motivation for this objective is: all the departments in an organization or across organization could use the same method. Thereby, the organization employees do not need to learn different methods, and can share best knowledge among each other.

- **Step-by-step**

The method should consist of step-by-step description. This can be fulfilled by specifying input and output for each step in the method. The motivation for this objective is: The method should make it easy

to move forward and backward during identification as well as refinement of KPIs. It is very common in practice that KPIs are refined during their use.

- **Clear**

The method description should be clear, precise and understandable, be implementable in real environment. The motivation for this objective is: The method should not confuse the users during its implementation so that no extra time spent on trying to interpret the method. Thereby, also non-experts could be involved in the implementation of method.

- **Independent of Performance Measurement Experts**

The method should be practical for users not specifically experienced in the area of dashboard and scorecard systems. The motivation for this objective is: All domain experts should be able to participate in a method for identifying and selecting KPIs. Thereby, their domain knowledge could be used in full when identifying KPIs. The objectives will also make it possible for organizations to design KPIs without investing much in performance management consultancy.

2. METHODOLOGY

This chapter describes used research methodology as well as its implication in our research process.

2.1 Research Approach

The research approach used for developing the method for KPI design is design science (Hevner et al., 2004). Design science is an emerging research paradigm in the Information Systems area. Design science is characterized by the creation of artifacts (i.e., constructs, models, methods and IT systems) for addressing problems in a business setting. Hevner et al. (2004) contrast design science with behavior science. Behavioral science has its origins in natural science and aims at explaining and predicting both human and organizational behavior. Design science, however, has its origins in engineering disciplines and aims to create innovative artifacts for solving practical problems.

Peppers et al. (2007) have presented a process for design science research that consists of six activities. Below we describe these six activities:

- 1. Identify problems and motivate:** The first activity in the design science process is to identify a business problem that motivates why the artifact need to be designed and developed.
- 2. Define objectives of a solution:** The second activity defines the desirable requirement on the artifact. These requirements are based on the identified problem but specify more precisely in which way the artifact solves the problem. These requirements guide the design and development of the artifact and will form the basis for the evaluation.
- 3. Design and develop:** The third activity describes the final artifact, including how it was designed and developed.
- 4. Demonstration:** The forth activity aims at showing the use of the artifact in an illustrative or real-life case. The purpose is to show the feasibility of the artifact.
- 5. Evaluation:** The fifth activity determines how well the artifact solves the problem taking into consideration the solution objectives (i.e., the defined requirements)

6. Communication. The sixth activity is to communicate the research carried out to researcher and practitioners.

2.2 Research Approach Applied

In this section, our application of the design science paradigm is described. Peffers et al. (2007) six activities are the base for the description.

- 1. Identify problems and motivate:** The business problem addressed in our research is that existing methods for designing KPIs are not easy to use for practitioners, see section 1.2. An important task for formulating the problem description was a literature study in which existing methods for designing KPIs were analyzed. The result of the literature study is described in section 3.2.
- 2. Define objectives of a solution:** Objectives have been specified for the method, see section 1.4. The objectives were specified by us, based on the literature study in which existing methods for designing KPIs were analyzed. The objectives were: generic method, step-by-step method, clear method and the method's use is independent of performance measurement experts.
- 3. Design and develop:** The design of the method was carried out in two major steps. First a draft method was designed based on earlier methods for KPI design. Second, the draft method was refined in collaboration with a focus group, and verified by applying it in a real case. The result of this second step was a final model. The design of the artifact is described in chapter 4.
- 4. Demonstration:** In our research, the demonstration was carried out by applying the final method based on data from a real case. The real case was carried out in a bank organization.
- 5. Evaluation:** In our research, the evaluation was carried out by evaluating the method for KPI design based on the objectives of the method. The evaluation was carried out in two steps. First, the final method was compared with an existing method of a bank organization for KPI design. This evaluation was done together with business stakeholders, in a group interview, in the bank familiar with the existing method. Second, the final method was compared to the David Parameter's method

for KPI design. This evaluation was based on informed arguments by the thesis' authors; see [Hevner et al, 2004].

6. **Communication.** In our research, the communication of the thesis results has been carried out by meetings and workshops with the bank organization.

2.3 Alternative Research Methods

In each of the six design science research activities other research methods could be used. Therefore, we here describe which alternative research methods that can be used in each of the activity, as well as its benefits and drawbacks. We here also explicitly motivate our own choice of research methods.

1. **Identify problems and motivate:** In our research, we have carried out a literature review and analysis on existing methods for KPI design in order to identify drawbacks of existing methods. The benefit of our chosen method is that the main existing generic methods for KPI design were analyzed and used as a base for our method. An alternative method could be to discuss drawbacks of existing methods for KPI design to identify the problem. The benefit of using KPI experts is that they have practical knowledge of KPI design.
2. **Define objectives of a solution:** In our research, we have defined the objectives based on the literature review and on analysis on existing methods for KPI design. Again, an alternative method could be using KPI experts and ask them what objectives they think are important for a method of KPI design. However, this requires an extended investigation which, in turn, requires further resources.
3. **Design and develop:** In our research, we designed the method for KPI design by first designing a draft model based on methods in the literature and then refine the model during focus group interviews. The benefit of this was that the method was designed in an iterative manner, with continuous input from the business stakeholders in the focus group. An alternative method could be to refine the bank organization own method for KPI design.

4. **Demonstration:** In our research, due to time limitation, we have demonstrated the method for KPI design by applying the method on only one real case. An alternative method could be to apply this method in several organizations, which would have made a stronger demonstration.
5. **Evaluation:** In our research, we evaluated the method by comparing it to an existing method used in an organization and also to one of the methods found in literature. An alternative method could be to compare our method with more than one method found in literature as well as gather KPI experts from different organizations to carry out the evaluation.

2.4 Working method

The six design science activities presented by [Peffer et al, 2003] should not to be seen as sequential but can be carried out in any order. It is not uncommon in design science research that an artifact is created before the problem addressed is specified; see [Peffer et al, 2003]. Therefore, in this section we describe an overview of our working method. That is, the actual order of the research activities carried out.

Details about the steps can be found in chapter 4, 5 and 6.

Step 1: Designing draft method based on the literature review

Step 2: Refining draft method using a focus group

Step 3: Demonstration of final method

Step 4: Evaluation of the final method

2.5 Ethical Deliberations Regarding Research Methods Used

Ethical deliberations regarding the research methods used are mainly concerning the interviews. The interviewees were informed that their feedback will be incorporated in our research. We did not record the discussions, but we took the minutes of the interviews.

The demonstration of the method was based on data from one of the largest bank of Sweden. We mutually agreed to not mention their name in this thesis report.

3. Extended Background and Related Research

This chapter consists of two parts. First an extended background in which is discussing and defining theoretical concepts used in the thesis and Second a related research section.

3.1. Extended background

This section presents an extended background presenting the area of business intelligence, dashboard and scorecard systems, and includes a discussion about main concepts used in the thesis.

3.1.1. Business Intelligence

Business intelligence (BI) is a wide group of applications and technologies for gathering, storing, analyzing, and presenting data to help organization to make better business decisions. Therefore, BI applications are sometimes categorized as decision support system. Examples of BI applications are data warehouse, OLAP tools, tools for designing customized reports, data mining tools, scorecard and dashboard systems.

BI applications normally include functions such as query and reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining [1]. Two prominent features of the new generation of business intelligence applications are integration and visualization. Integration means support for integrating data from different IT systems. Visualization means that information is presented graphically for the users, such as using bar, charts and other forms of diagrams.

3.1.2. Scorecards and Dashboards systems

Scorecard and Dashboard systems [19, 23] are two examples of the new generation of business intelligence applications. They provide techniques to view data and information graphically.

The difference between a scorecard, dashboard, and report can be one of fine distinctions. Each of these systems can combine elements of the other, but at a high level they target distinct and separate levels of the business decision making process [2].

Dashboards systems are more focused on specific operational goals. It goes more on details compared to scorecard. Dashboard is used most by the operational managers to monitor the day-to-day operations [2, 18, 19].

Scorecard systems are more focused on business strategy [2, 23]. Scorecard systems are mostly used by senior management level to view the business performance on a strategic level.

3.1.3. Performance metric

A performance metric is a measure of an organization's activities and performance. Traditionally, metrics are financed based, for example, gross revenue by year. However, metrics may also focus on the performance regarding customer values, such as customer satisfaction, or regarding internal processes, such as number of customer meetings per month.

The actual term of metric refers to a direct numerical measure that represents a part of business data in relationship of one or more dimensions. If the metric is gross revenue by year, the business data would be gross revenue, the dimension would be time (year) and the measure would be a value in euro (gross revenue). It is feasible to manufacture an aggregate metric that uses the instance metric and applies a function (average, maximum, minimum, sum, or count) to get a useful result. [17]

3.1.4. Performance Indicator (PI)

A performance Indicator (PI) is a performance metric that represents the performance in one particular area, but may not necessarily be critical to the overall strategic execution [16].

3.1.5. Key Performance Indicator (KPI)

A key performance indicator (KPI) is a PI that represents a set of measures focusing on “those aspects of organizational performance that are most critical for the current and future success of the organization” [16]. It measures and monitors business goal achievement and creates an essential feedback to enhance the performance of the business [10]. They may have to be redefined or refined for specific organization requirements [7]. They basically help out an organization to define and measure progress headed for organizational goals and verifies how far a metric is above or below a pre-determined target which KPI represents [17].

3.1.6. Characteristics of effective KPIs

According to literature about KPIs there are several characteristics of effective KPIs. We have gathered a set of characteristics from literature and presented them in this section.

1. Aligned with enterprise goals

KPI should always align with enterprise goals and objectives. Each KPI is a metric that directly supports understanding how the company is performing relative to one or more of its goals [2].

2. Easy to understand

The KPI should be easy to understand, since employees must understand what is measured by the KPI [2, 14]

3. Measurable

The measures of the KPIs should be quantifiable so they can determine if the performance headed for an objective is getting improved or not [14].

4. Verifiable

The data used to calculate KPIs should be auditable both in terms of its accuracy and appropriateness for purpose [14].

5. Actionable

It should be possible to act on a KPI in order to improve performance. Leading indicators are usually more actionable than lagging indicators [2].

6. Owned

An individual or a group should be responsible for the result of the KPI, and know what to do when performance decline [2].

7. Few in number

The KPIs should be few in number in order for the employees to focus on a few high valued tasks [2].

8. Balanced

The KPIs should not undermine each other and /or sub-optimize processes [2].

9. Standardized

The KPIs should be able to be used throughout the organization, thereby, supporting aggregation and comparison of different business units and departments [2].

10. Accurate

It is important to get accurate values of the KPI in order to trust the values (i.e., the data quality should be high) [2].

11. Timely

It is important to get values of the KPI in right-time in order to act before it is too late [2, 14].

12. Affordable and Easy to collect

In the case KPIs cannot be easily gathered, they will sooner or later be disregarded. Consequently a KPI should not require a heavy investment of time and money [14].

3.1.7. KPIs and the Performance Management Process

In performance management, the KPIs are in the center for measuring the performance of the organization. The role of KPIs can be described in a performance management process (also called performance measurement process). The process described below and visualized in Figure 1. The process is our own design, but influenced by [2, 10, 20].

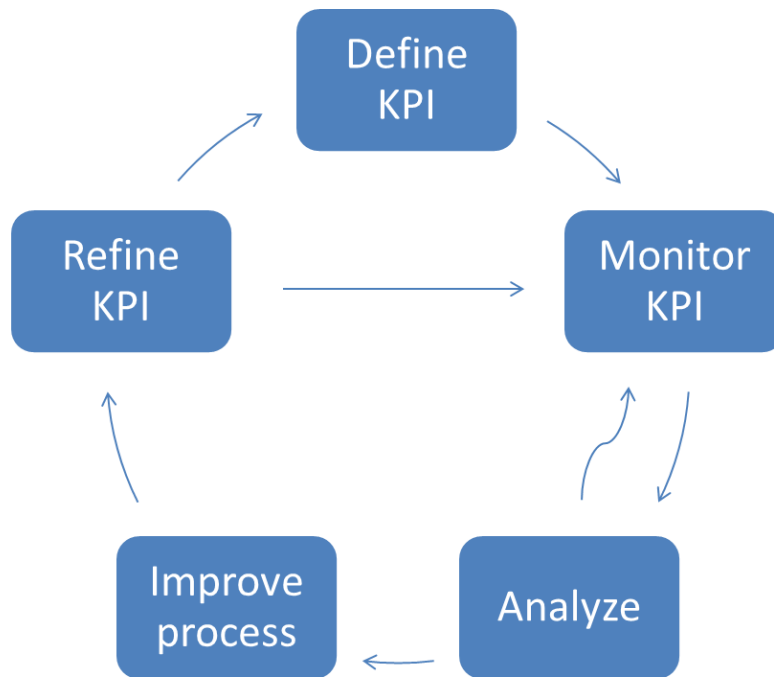


Figure 1. A performance management process

Step 1: Define KPI

In this step, the KPIs are defined. The target values for the KPIs are also needed to decide.

Step 2: Monitor KPI Compliance

In this step it should be controlled whether the KPIs target values are achieved or not. [20]

Step3: Analyze data

In this step the overall KPI compliance should be checked and analyzed in order to determine all problematic components. Then a list of component that needs to be improved should be created. If the result of the analysis will show that there is no need of improvements of the business processes, the next step will be to continue monitoring KPIs, i.e., go to step 2.

Step 4: Improve business processes

In this step, necessary changes in the business process are carried out if needed.

Step5: Refine KPI

The owner department should consider reviewing the KPI result based on regular basis. The KPIs should be reviewed any time when the critical success factors are reviewed. KPI also should be flexible in the term of any relevant changes in environment, processes and conditions [10]

3.1.8. KPIs and Critical Success Factors

A critical success factor (CSF) is an element (i.e., factor or activity) that must exist or be carried out for an organization to be successful. CSF is not an outcome of a process, but KPIs are. The relation between CSFs and KPIs is often that KPIs can measure performance against CSFs. Therefore, KPIs can also be derived from CSFs [22].

3.2.Existing KPI Design Method

There exist two well-known generic KPI design methods: Kaplan and Norton's balance scorecard method and Parameter's method. They are generic in the meaning of being applicable in any business domain.

3.2.1 Kaplan and Norton's on KPI design

The balanced scorecard is a strategic, planning and management framework (as illustrated in Figure 2) developed by Kaplan and Norton. The balanced scorecard is used in organizations worldwide to align business activities to the vision and strategies goals of the organization and monitor organizational performance against strategic goals.

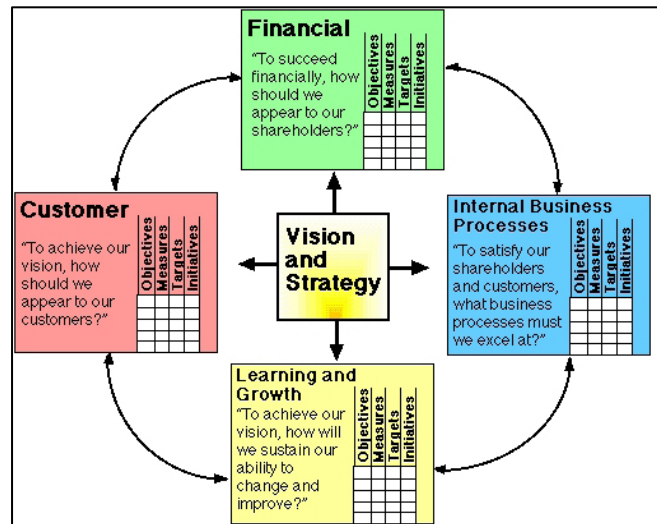


Figure 2. Balance scorecard framework

The balanced scorecard presents four perspectives, i.e., Financial, Customer, Internal Business Processes, and Learning & Growth. In each perspective some measures/metrics/KPIs are designed and maintained to determine an organization’s performance, while other measures/metrics/KPIs are designed and maintained to determine the long term factors of success. With the balanced scorecard, organizations are able to monitor their current performance (in finance, customer satisfaction, and business process results) using measures/metrics/KPIs and to improve the performance [15].

Many researchers have suggested alternative headings for these perspectives, and some also suggested using either additional or fewer perspectives according to organization culture and requirements. To apply the Balanced Scorecard, it is required to choose four or five solid measures/metrics/KPIs in each perspective. The most important measures/metrics/KPIs are called the “Key” measures/metrics or “Key Performance Indicators” [15].

We also used the balanced scorecard concept in our proposed method for KPI design, see chapter 4, where we described all the steps in details.

According to Kaplan and Norton, a working balanced scorecard with KPIs can be established in 16 weeks [15]. For each of the balance scorecard perspective, the implementer of the balance scorecard must choose KPIs, but there is no information how the user should identify and select the KPIs. That is, the balance scorecard does not specify how to go from goals (called “objectives” in [15]) in each perspective to a certain list of KPIs. Therefore, a major design challenge faced with balance scorecard is

justifying the choice of measures. In balanced scorecard design it is not easily possible to answer these questions: “How to identify the accurate measures?” or “Are the chosen measures accurate?” and “Why these measures have been chosen?” [21].

3.2.2 Parameter on KPI design

David Paramenter presents a method for KPIs design and implementation [22]. His book includes guidelines how to choose team members responsible for KPI selection and guidelines of how to manage all performance measure in a database and make them available to all teams. Especially, Parameter presented a method to manage the major design challenge in balanced scorecard, i.e., to select the performance measures/metrics/KPIs and to justify the choices of them.

In his research on “KPI selection”, there are several intermediate steps required to translate the vision/mission/values into KPIs as shown in Figure 3 below.

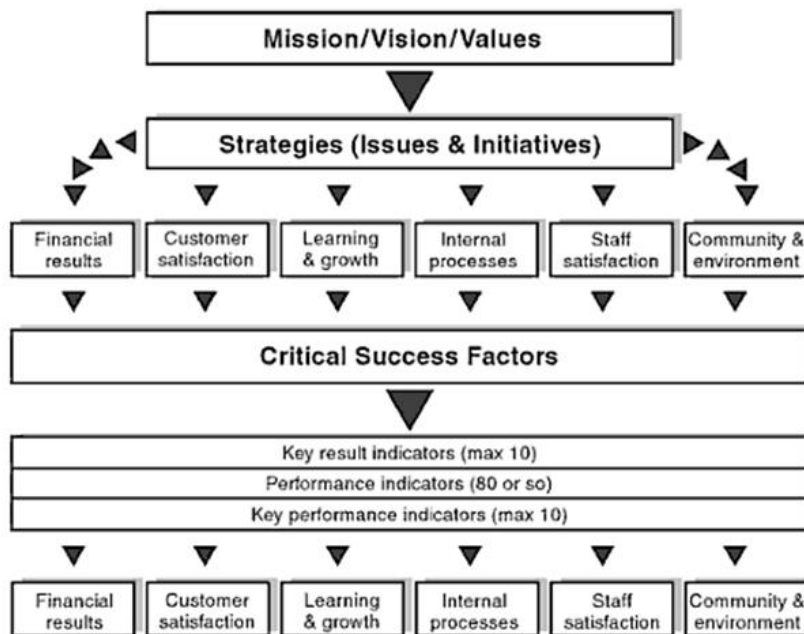


Figure 3. Foundation Stones for Implementing KPI

Parameter was inspired by the balanced scorecard concept to define the organization vision, mission, strategies and perspectives [15]. According to Parameter, these perspectives may not be applicable in all organizations and they might be varied depending on organization needs.

Parmenter provided some guidelines to identify Critical Success Factors (CSF) under the defined perspectives. CSFs are also the base for identifying KPIs, since the KPIs measure the CSF.

However, Parameter does not provide guidelines that are clear enough to reach KPI from CSF. That means that the success to identify KPI depends on the experience of team members. Parameter only discussed 10/80/10 rule for the identification of KPI, see Table 1. According to this rule, out of 100 identified measures within Critical Success Factors (CSF), the relations between KPI, PIs and KRIs are the following.

10 are Key Result Indicators (KRIs)	Tells you how you have done in a perspective
80 are Performance Indicators (PIs) & Result Indicators (RIs)	Tells you what to do
10 are Key Performance Indicators (KPIs)	Tells you what to do to increase performance dramatically

Table 1. The 10 /80/10 rule

3.2.3 The need for a method of KPI design revisited

The process of KPI design requires more clarification than the one given by Parameter and Kaplan and Norton. There is a need to simplify the process of KPI design by introducing more intermediate steps to break down the complexity of this process and make it simple to implement. This thesis provides methods for KPIs design and to overcome the limitations of earlier works in KPI design.

4. Design of a Method for KPI design

This chapter describes the method for KPI design and also describes how the method was designed. A draft method was first designed based on reviewing earlier research. The draft model was discussed in a focus group in an organization, And after further analysis and considerations by authors of the thesis, resulted in a refined method.

4.1.Designing of Draft Method for KPI design

In this section, the first part of the research process for designing a method for KPI design is described. The process was carried out by studying and combining steps from earlier research .Two main sources were used: Kaplan and Norton's balance scorecard [15] and Parameter's method of KPI design [22]. Parameter's method included ideas from the balance scorecard framework; therefor Parameter's method had the main influence on our draft model.

4.2.Draft Method for KPI design

A draft method for KPI design was designed based on reviewing earlier research, especially Kaplan and Norton's balance scorecard method [15] and Parameter's method [22]. The draft method is described in text below. The draft method is also described in Figure 4 and also compared to Parameter's.

Draft method for KPI design

Parameter's method

Step 1:
Define Vision/Mission/Values

Vision/Mission/Values

Step 2:
Define Strategy

Strategy

Step 2:
Define Perspectives

Perspectives

Step 4:
Define Goals

Step 5:
Design Means

Step 6:
Design Critical Success Factors
by using Mean Filtering 1 and
Mean Filtering 2

Critical Success Factors

Step 7:
Design KPI by applying KPI
characteristics

Key Result Indicators/
Performance Indicators/
Key Performamnce Indicators

Figure 4. Proposed draft model to design KPI in comparison to David Paramenter's method

Step1: Define Vision/Mission/Values

In this first step - define vision/mission/values - an organization has to identify its vision and mission statements, as well as its values.

A vision is where an organization wants to go. In other word It defines the desired future state of an organization in terms of its fundamental goals/objectives and/or strategic direction. Vision is a long term view. For example a charity working with the poor might have a vision statement which read "A world without poverty".

A mission is the purpose and aim of the organization. It defines what the organization is, what it aspires to be and serve as framework to evaluate the current activities.

A value is the approach and the manner in which an organization needs to perform in order to achieve the vision. It reflects the core ideology of an organization and defines how to carry out the mission.

Step 2: Define Strategy

In this second step - define strategy - an organization needs to define their strategies.

Strategy is the way an organization intends to achieve its vision. In a competitive environment, your strategy will distinguish organizations and their competitors. Strategy is usually seen as a subtype to the concepts of activity or action, and not a subtype to a goal. That means that a strategy is something that organization performs in order to achieve a desirable state of affair, such as a vision or a goal. A strategy could be represented as a statement but more common as a plan with activities on a high business level.

Step 3: Define Perspectives

In this third step - define perspectives - an organization need to identify the perspectives in which they need to identify KPIs. We used the balanced card's suggested perspectives but they can be defined by organization according to their needs and requirements.

A perspective is topic area. A topic area encourages the identification of relevant measures in that area.

Step4: Define Goal

In this forth step - define goals - an organization need to define goals under each defined prospective. These goals also iteratively decompose into several sub-goals to make them measurable and easy to understand.

A goal is a projected state of affairs that a plan is intended to achieve, and, when achieved, terminates the behavior intended to achieve it. Normally goals are suggested by stakeholders. Goals can be identified by studying of similar or current businesses or elaborating other goals, and in system requirements.

Step 5: Design Means

In this fifth step - design means - an organization need to design means to achieve the defined goals. Means are the activities, capabilities, instruments, devices, techniques or methods which help system to achieve the goal. That is, they can impact an enterprise in goals achievement. Afterwards we able to identify the critical success factor from means.

Step 6: Design Critical Success Factors

In this sixth step - design critical success factors (CSFs) - an organization need to design CSF with the help of mean filtering 1 and 2 (description below).

CSF is the term for an element that is necessary for an organization or project to carry out its mission. It is a critical factor or activity required for ensuring the success of a company or an organization.

We can identify CSF based on two sub-steps, mean filtering 1 and 2, described below.

Sub-step: Mean Filtering 1

CSFs can be designed by mean filtering 1, which aims to choose the means that support most of the goals and use these means to design CSFs. Mean filtering 1 is described in Table 2. The table consists of two dimensions, goals and means. In Table 2, Mean 4 is a mean which support four goals, and appear as the most appropriate case for CSF identification. The table is to be applied together with stakeholders of the organization that need to fill in the table.

	Goal1	Goal2	Goal3	Goal4
Mean1		✓		
Mean2	✓	✓	✓	
Mean3		✓		✓
Mean4	✓	✓	✓	✓

Table 2. Mean filtering 1

Sub-step: Mean Filtering2

CSFs can also be designed by mean filtering 2, which aim to choose the means that is the most urgent and use these means to design CSFs. Mean filtering 2 is described in Table 3. The table consists of two dimensions, means and a dimension consisting of two options: important and urgent. In Table 3, Mean 2 and 3 can be considered as more critical than other means. The table is to be applied together with stakeholders of the organization that need to fill in the table.

	Important	Urgent
Mean1		✓
Mean2	✓	✓
Mean3	✓	✓

Table 3. Mean filtering 2

Step 7: Design KPIs

In this seventh step - design KPIs – a list of KPIs is designed. First a list of candidate KPIs is designed based on the chosen CSFs. Then a sub-step, Apply KPI characteristics, is carried out in order to end up with a final list of KPIs.

Sub-step: Apply KPI characteristics

The lists of KPI characteristics, presented in section 3.1.6 and Table 4 can be applied on the candidate KPIs in order to identify the KPIs. There is no necessity for the selected indicator to cover all the characteristics; normally a good KPI is the one that covers most of these characteristics.

KPI Characteristics	
1	Aligned
2	Measurable
3	Verifiable
4	Actionable
5	Balanced and Linked
6	Owned
7	Timely
8	Affordable and Easy to collect
9	Standardized

Table 4.KPI characteristics

The main differences between the draft method of KPI design and the Parameter’s method for KPI design are the following:

- The draft model has included a step for defining business goals
- The draft model has included detailed description how to go from business goals to CSF via use of means
- The draft model has included detailed description how to go from CSF to KPI

4.3.Designing the Final Method for KPI design

In this section, the second part of the research process is described, resulting in a final method for KPI design. In this part, a focus group from an organization was used to gather information of how to enhance the draft method for KPI design. The focus group was met in several workshops and the method was refined after each meeting based on their comments.

4.3.1. Focus Group Research Method

A focus group is a form of qualitative research method in which a group of people is brought together for a more or less, open-ended discussion about a particular topic, issue or concern. A facilitator (in this case the researcher) provides a structure to the meeting, integrating open-ended questions to promote discussion. We have chosen to use the method focus group to provide multiple viewpoints or responses

on a specific problem. Furthermore, focus group are known to be efficient since multiple responses can be obtained in a shorter period of time as compared to individual interview with each participant [13]. Our focus group consists of people experienced in an area of Business Intelligence and also belongs to different industry domains. During the focus group meetings, multiple viewpoints were expressed that assisted in refining the model.

4.3.2. Focus Group Process

The research steps taken using the focus group were the following:

Prepare a set of questions to promote discussion

In this step open ended questions as well as literature on BI and KPIs was presented to the focus group.

The list of questions that considered in open discussion was:

- a. Is the proposed (draft) method applicable to all type of organizational structures and domains, or applicable to only certain organizational structures and domains?
- b. Ideally, how do organizations define and manage their goals?
- c. What steps need to be introduced to identify the KPIs from set goals?
- d. What steps to be introduced in order to maintain and refine the KPI?
- e. What factors make the propose framework more usable?
- f. What recommendations would you make that would enhance the success of the proposed framework?

1. Prepare a list of possible focus group participants and invite them to participate.

The people invited to participate in the focus group were experts in Business Intelligence, ERP implementations, CRM, Project Management, Business Analysis and financial forecasting. Total four people were invited and all of them attended the focus group meeting. The participants have implemented KPIs in projects and worked on many different roles in well-known companies.

2. Carry out the focus group meeting

The focus group meeting was held in a specially booked board room, from 3:00 pm to 7:00 pm, 29 May 2010. No digital recorder was used to record the focus group discussions but meeting notes were taken. The discussion was informal and provided a wealth of information.

The participants of the focus group improved the drafted model and finally all members agreed on the improved model.

3. Analyze the focus group discussion

The data analysis was purely focused on the data from the discussion of the focus group participants.

The analysis aimed to find important statements that could improve the draft method.

Following statements for improving the method were found as a result of the analysis of focus group discussion:

1. The process from goal to KPI is unclear and needs more clarification.
2. There is a need to add more steps to resolve the complexity
3. The “mean” concepts should be replaced with another concept or concepts
4. Each step in the method should have a defined input and output

4.4.Final method for KPI design

In this section we describe the final method for KPI design. The first four steps in the draft method was the same, but step 5-7 refined to two main i.e. steps 5, Define Performance Indicators (PIs) and step 6, Identify Key Performance Indicators, see Figure 5. The refinement was carried out based on feedback from the focus group on the draft method for KPI design.

Draft method for KPI design

Final method for KPI design

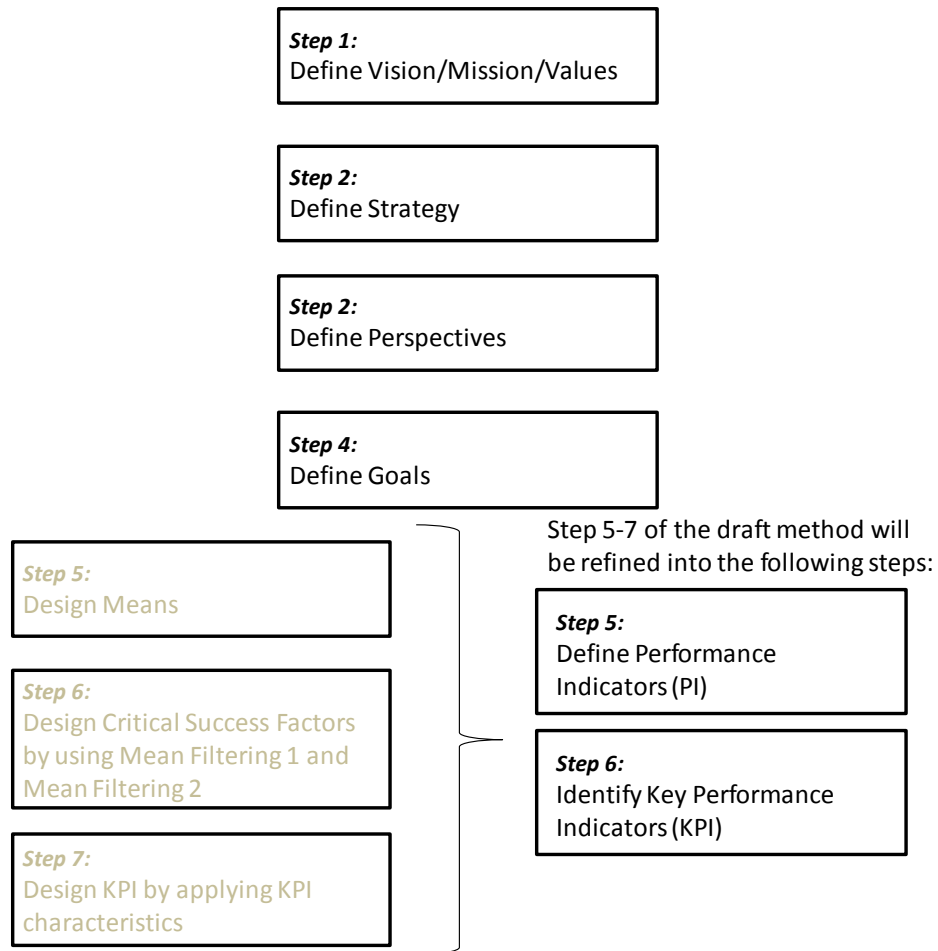


Figure 5. Step 5-7 in the proposed draft model will be refined in the final model to step 5 and 6.

Refined step 5 and 6: Define Performance Indicators (PI) and Identify Key Performance Indicators (KPI)

Step 5 and 6 in the final model are described in Figure 6, which also specify the input to and output from the steps.

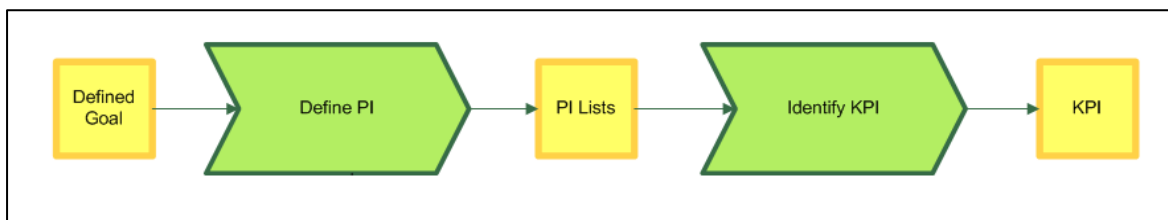


Figure 6. Step 5 and 6 and their input/output

There are two alternative approaches of the refined steps 5 and 6. The reason for this is that there are two types of goals as input to step 5, and they will result in two alternative approaches of how step 5 and 6 will look like. The first type of goal is target oriented goals. Target oriented goals are goals which define KPI based on how successfully an organization is performing to reach to their target. The second type of goal is maintenance oriented goals. Maintenance oriented goals are goals which define KPIs based on how successfully an organization is performing to choose the right track for maintenance.

Approach 1 of step 5 and 6: Target Accomplishment Approach

The target accomplishment approach is an approach in which organization aims to define KPI in order to measure how successful they are approaching to a certain target.

We are going to define each step and sub-step, including their input and output in approach 1, see Figure 7.

Step 5: Define Performance Indicators (PI)

In this fifth step - define performance indicators (PI) – performance indicators of an organization are defined.

PIs are metrics that represent the performance in one particular area, and can be both strategic and tactical, but may not necessarily be critical to the overall strategic execution [16].

- Input to the step: Defined Goal
- Output to the step: List of PIs

How to apply the step: The step will be carried out by another sub process which consists of following sub-steps: Identify success factor, Apply SF filtering, and Defining PI, see Figure 7.

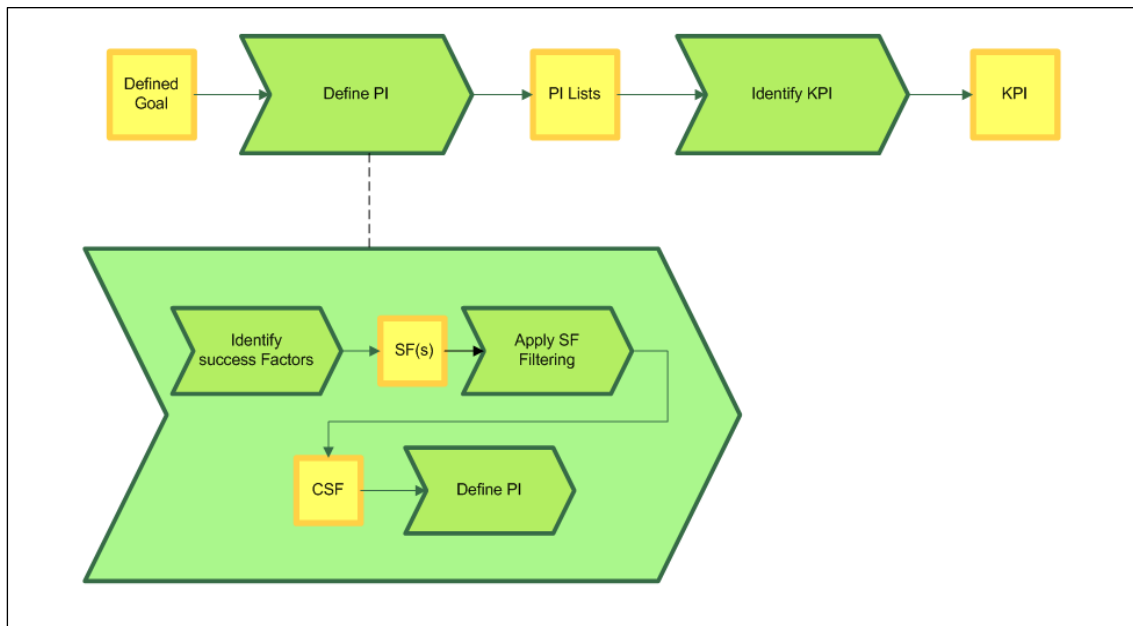


Figure 7. Step 5 and 6 of the Target Accomplishment Approach including sub-steps to step 5

Sub-step: Identify Success Factors (SF)

In this sub-step success factors (SFs) are identified

Success factor is any element (factor or activity) that is necessary for an organization or project to achieve its mission, goals and to ensure its success.

- Input to the sub-step: Defined Goal
- Output to the sub-step: List of SFs

How to apply the sub-step: During this process the success factors (SF) for the each goal should be identified. At the end of this process we will have the list of success factors.

Sub-step: Apply SF Filtering for identifying CSFs

In this sub-step SF Filtering is applied in order to identify Critical Success Factors (CSF). This means that we identify Critical Success Factors (CSF) by filtering SF(s) based on the different criteria followed by organization at hand. We should filter out the SF(s) which are more critical for achieving the goals.

A Critical Success Factors is a success factor is any element (factor or activity) that is necessary for an organization or project to achieve its mission, goals and to ensure its success.

- Input to the sub-step: List of SFs
- Output to the sub-step: List of CSFs

How to apply the sub-step: First of all we have to consider the goals which has higher priority or the goals which need to be urgently accomplished. In this approach, we filter SF using two alternative or complementing instruments.

First method to filter out SF: we filter out SF by sorting out the more the SF that is based on important and urgent relevant goals compare than other SF, see Table 5, In the case of Table 5, SF3 considers as the one which is more critical SF than other SFs. Based on the strategy of the organization at hand it is also possible all the success factors are taken into account

	Support important goals	Support urgent goals
SF1		✓
SF2	✓	
SF3	✓	✓

Table 5.Success Factor Filtering 1

Second method to filter out SF: we filter out SF that is more common among different goals, i.e., we select the success factors which regard as more common ones. For instance in Table 6, SF3 is an activity which is more common among four goals in system, and appears as the most appropriate case for CSF identification. Subsequently we can identify critical success factor (CSF) based on the SF which are more critical in Business process.

	Support Goal1	Support Goal2	Support Goal3
SF1			
SF2		✓	
SF3	✓	✓	✓

Table 6.Success Factor Filtering 2

Sub-step: Define PIs

In this step we will define PIs based on CSFs

- Input to the sub-step: List of CSFs
- Output to the sub-step: List of PIs

How to apply the sub-step: We will define PI(s) based on CSF. It may be more than one PI for each CSF. Each performance Indicator must be measurable.

Step 6: Identify Key Performance Indicators (PI)

In this fifth step - identify key performance indicators (PI) – key performance indicators of an organization are identified.

KPIs are metrics that represent the performance in one particular area, can be both strategic and tactical, and necessarily critical to the overall strategic execution [16].

- Input to the step: List of PIs
- Output to the step: List of KPIs

How to apply the step: There are some principal characteristics for KPI listed that can be used as support to identify the KPI. This is described in the sub-step below.

Sub-step: Apply KPI characteristics

The lists of KPI characteristics, presented in section 3.1.6 and Table 4 can be applied on the candidate KPIs in order to identify the KPIs. There is no necessity for the selected indicator to cover all the characteristics; normally a good KPI is the one that covers most of these characteristics.

Approach 2 of step 5 and 6: Maintenance Approach

The maintenance approach means an approach in which organization aims to define KPI in order to measure how successful they are currently performing. This approach does not measure how successful they are approaching to a certain target.

We are going to define each step and sub-step, including their input and output in approach, see Figure 8.

Step 5: Define Performance Indicators (PI)

In this fifth step - define performance indicators (PI) – performance indicators of an organization are defined.

PIs are metrics that represent the performance in one particular area, and can be both strategic and tactical, but may not necessarily be critical to the overall strategic execution [16].

- Input to the step: Defined Goal
- Output to the step: List of PIs

How to apply the step: The step will be carried out by another sub process which consists of following sub-steps: Identify success factors, Apply SF filtering, Identify Method (measurement functions) and Identify PI, see Figure 8.

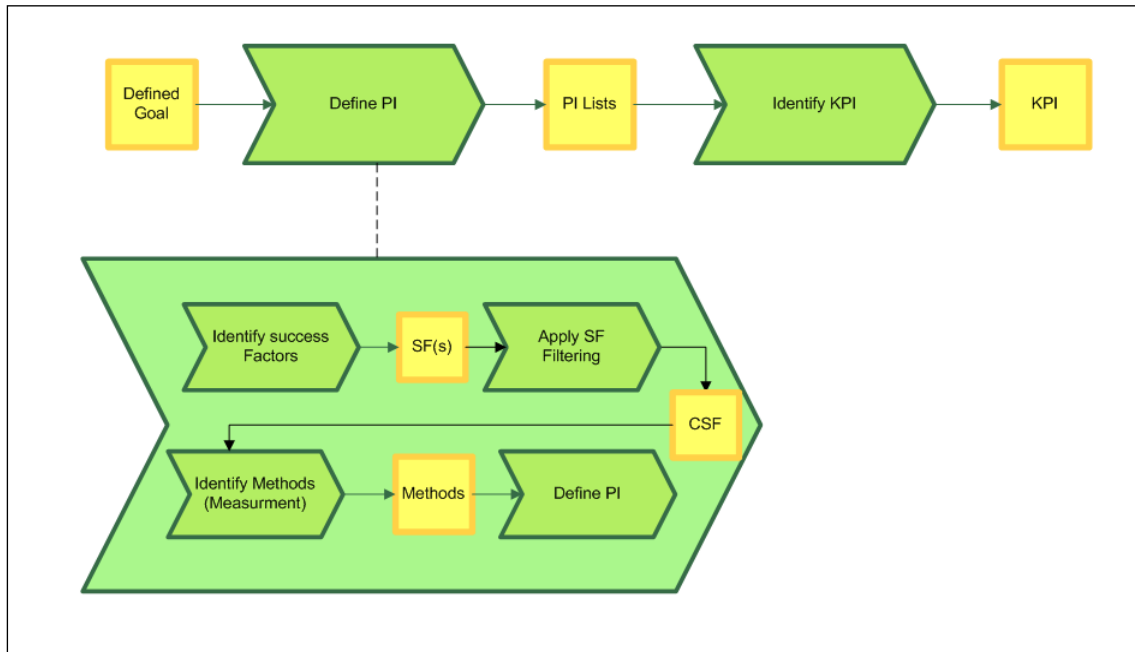


Figure 8. Step 5 and 6 of the Maintenance Approach including sub-steps to step 5

Sub-step: Identify Success Factors (SF)

In this sub-step success factors (SFs) are identified.

Success factor is any element (factor or activity) that is necessary for an organization or project to achieve its mission, goals and to ensure its success.

- Input to the sub-step: Defined Goal
- Output to the sub-step: List of SFs

How to apply the sub-step: During this process the success factors (SF) for the each goal should be identified. At the end of this process we will have the list of success factors.

Sub-step: Apply SF Filtering for identifying CSFs

In this sub-step SF Filtering is applied in order to identify Critical Success Factors (CSF). This means that we identify Critical Success Factors (CSF) by filtering SF(s) based on the different criteria followed by organization at hand. We should filter out the SF(s) which are more critical for achieving the goals.

A Critical Success Factors is a success factor is any element (factor or activity) that is necessary for an organization or project to achieve its mission, goals and to ensure its success.

- Input to the sub-step: List of SFs
- Output to the sub-step: List of CSFs

How to apply the sub-step: First of all we have to consider the goals which has higher priority or the goals which need to be urgently accomplished. In this approach, we filter SF using two alternative or complementing instruments.

First method to filter out SF: we filter out SF by sorting out the more the SF that is based on important and urgent relevant goals compare than other SF, see Table 5, In the case of Table 5, SF3 considers as the one which is more critical SF than other SFs. Based on the strategy of the organization at hand it is also possible all the success factors are taken into account

	Support important goals	Support urgent goals
SF1		✓
SF2	✓	
SF3	✓	✓

Table 5.Success Factor Filtering 1

Second method to filter out SF: we filter out SF that is more common among different goals, i.e., we select the success factors which regard as more common ones. For instance in Table 6, SF3 is an activity which is more common among four goals in system, and appears as the most appropriate case for CSF identification. Subsequently we can identify critical success factor (CSF) based on the SF which are more critical in Business process.

	Support Goal1	Support Goal2	Support Goal3
SF1			
SF2		✓	
SF3	✓	✓	✓

Table 6.Success Factor Filtering 2

Sub-step: Identify Methods (Measurement Methods)

In this sub-step we should propose measurement method to measure whether running activities are performing well or not.

Measurement method should provide a measurable entity as outputs to make possible for organization to realize the better maintenance activities to improve the performance.

- Input to the sub-step: List of CSFs
- Output to the sub-step: Measurement method

How to apply the sub-step: Measurement method is identified based on critical successful factors. It is applied according to the type of maintenance goals which are under consideration

Sub-step: Define PIs

In this step we will define PIs based on CSFs

- Input to the sub-step: Measurement method(s)
- Output to the sub-step: List of PIs

How to apply the sub-step: At the result of running these methods we will have the list of measurable indicator which is called Performance indicators.

Step 6: Identify Key Performance Indicators (PI)

In this fifth step - identify key performance indicators (PI) – key performance indicators of an organization are identified.

KPIs are metrics that represent the performance in one particular area, can be both strategic and tactical, and necessarily critical to the overall strategic execution [16].

- Input to the step: List of PIs
- Output to the step: List of KPIs

How to apply the step: There are some principal characteristics for KPI listed that can be used as support to identify the KPI. This is described in the sub-step below.

Sub-step: Apply KPI characteristics

The lists of KPI characteristics, presented in section 3.1.6 and Table 4 can be applied on the candidate KPIs in order to identify the KPIs. There is no necessity for the selected indicator to cover all the characteristics; normally a good KPI is the one that covers most of these characteristics.

5. Demonstration

This chapter describes the demonstration that was carried out by applying the final model in a real-life case. The real-life case was carried out in a bank organization

5.1. Description of the real case used in the demonstration

The goal of using the real case is to collect data from the bank to be able to demonstrate the final method for KPI design with actual data. The bank is one of the largest banks of Sweden.

Our real case scope was to collect data regarding the quality assurance process for their external and internal websites. The focus was to collect data about the goals, in order to derive KPIs based on the final method for KPI design,

In order to collect data, we received a document with stated goals of quality assurance process for their external and internal websites.

The chosen bank had two types of goals for measuring the quality of their website: user goals and business goals. These are described below:

User goal means how well user expectations are met when interacting with the website. The bank has identified the following user goals in their document:

- a. Findability
 - The user must be able to find relevant content quick and easy - clarity
 - Information should be available in the right context with other related information the user possibly would need
 - Structure - the right content in the right place
- b. Content and presentation (page layout)
 - Content should be in line with the user's needs
 - All parts of content for the current need are present
 - Trustworthiness

- Actuality of content
 - Content that should be identical and used in more than one website are up-to-date and the same everywhere
 - Applicable to relevant guidelines (e.g. writing guideline, tonality guideline)
 - In line with the trends/prerequisites that are valid at the Internet at any given time
 - Should have the user's task in focus
 - Should support the bank's business goals, strategies etc.
- c. Interactivity and functions
- Functionality should be in line with the user's needs
 - Should give the user possibility to interact with the system – in the way the user wants, when the user wants
 - Should give the user possibility to interact with the content – e.g. commenting, ask questions, etc
- d. Design (look and feel)
- Easy/simple design
 - The user should recognize bank when viewing a page
- e. Language and tonality
- Assure a good language use in the context of web, the brand of the bank (tonality) and the user's perspective
 - Well-written texts, the user should have the experience of one language all over the website, no spelling errors
 - Use a language that is easy to understand for the target audience
 - Explain difficult terms if used
 - Use only bank's Certified Terms
 - Don't use words from foreign Languages e.g. English
 - Avoid abbreviations
- f. Access and speed
- Page loading time
 - Availability of the system and all the parts it consists of – uptime

Business goals means goal related to the business overall goals. The bank has identified the following user goals in their document:

- a. Result-oriented - we want to achieve good results in everything we do
- b. Open - we are transparent and open in our communication
- c. Innovative - we are willing to learn new things and change
- d. Committed - we are jointly building a sustainable business

5.2. Description of the demonstration

In this section, we demonstrate the final method for KPI design based on the collected data for the real-life case. We demonstrated four user goals and three business goal, we have applied the steps from the final method for KPI design, see Table 7-13.

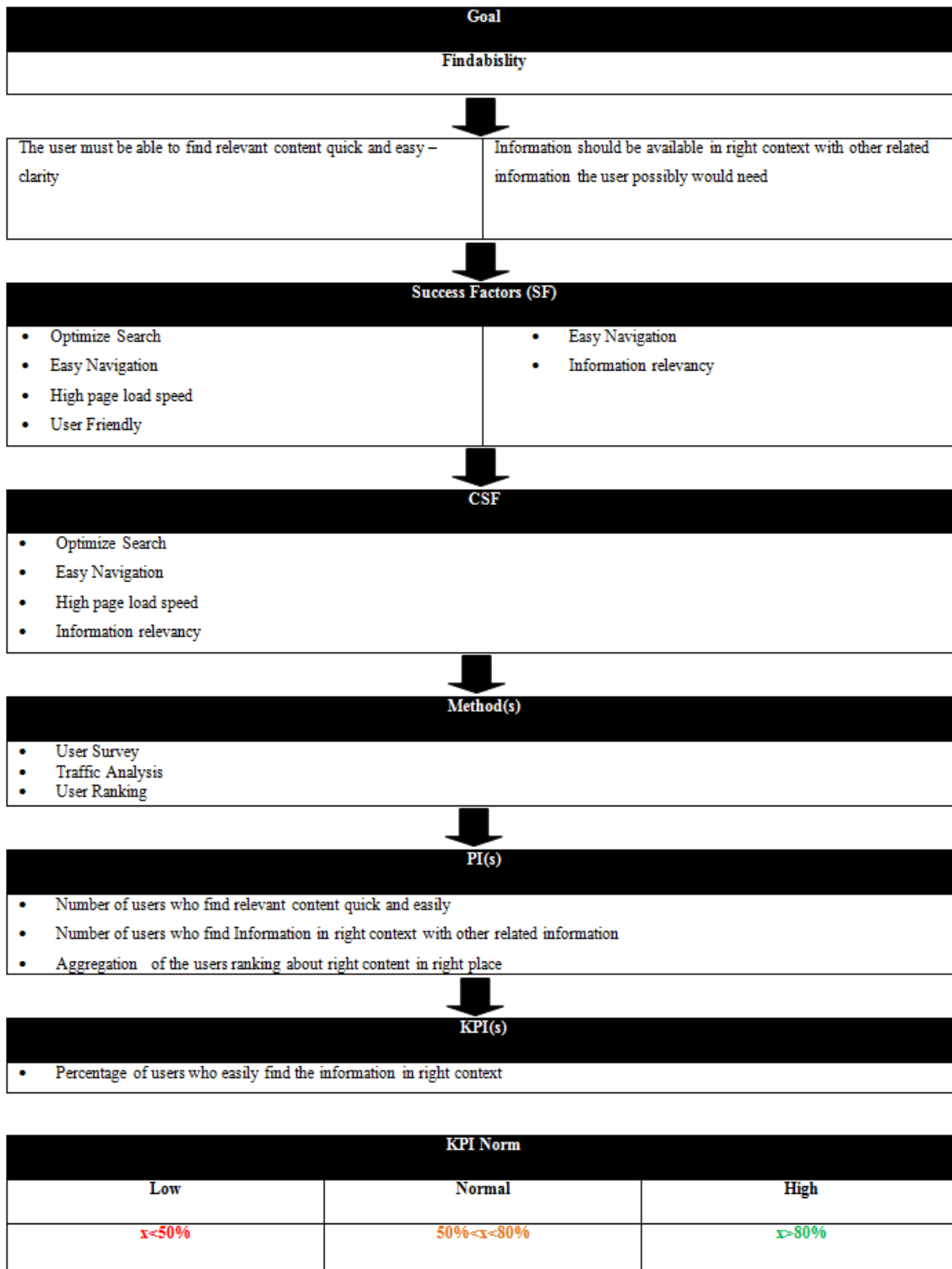


Table 7. KPI design based on the bank's user goal Findability

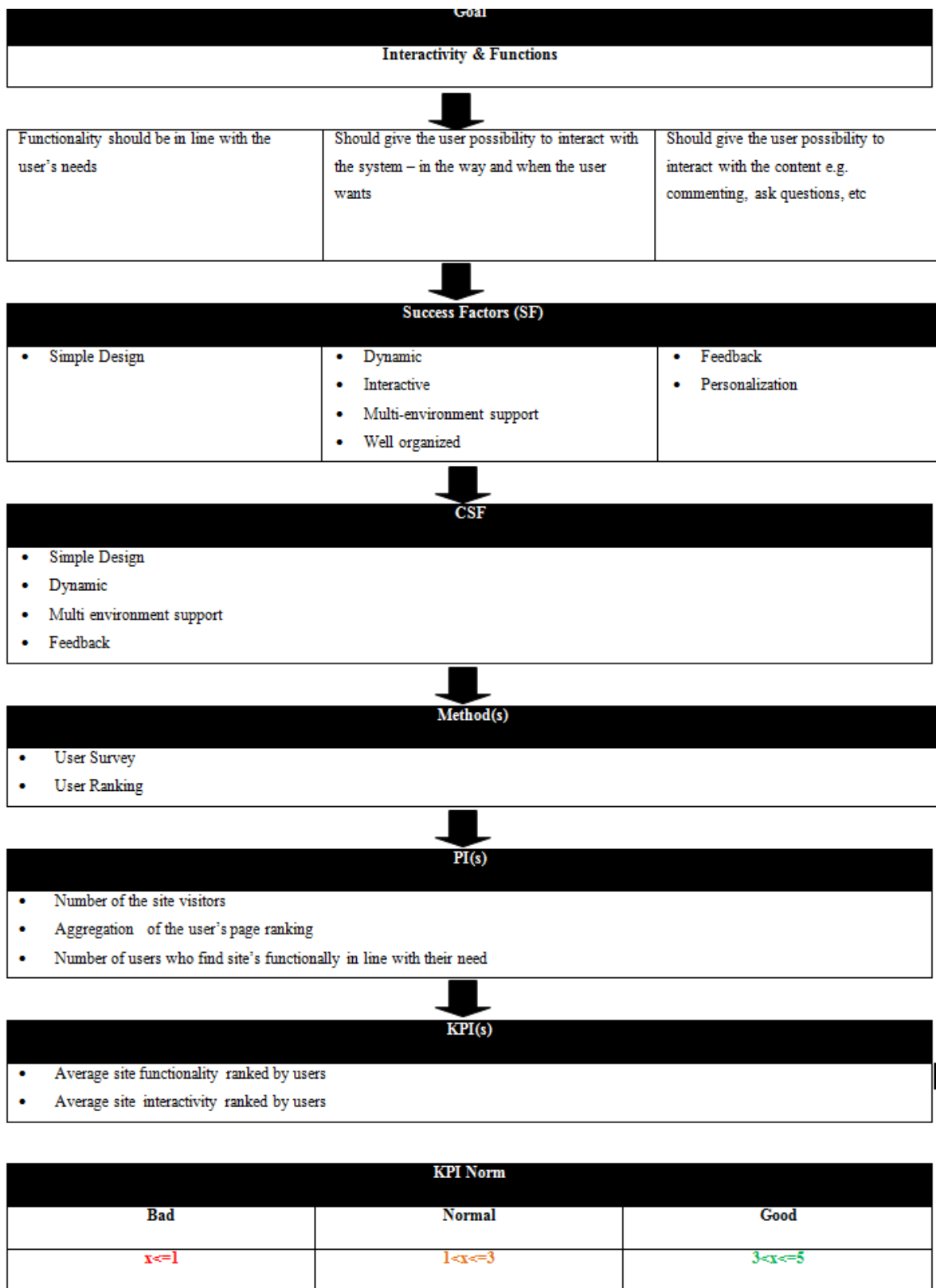


Table 8. KPI design based on the bank's user goal Interactivity & Functions

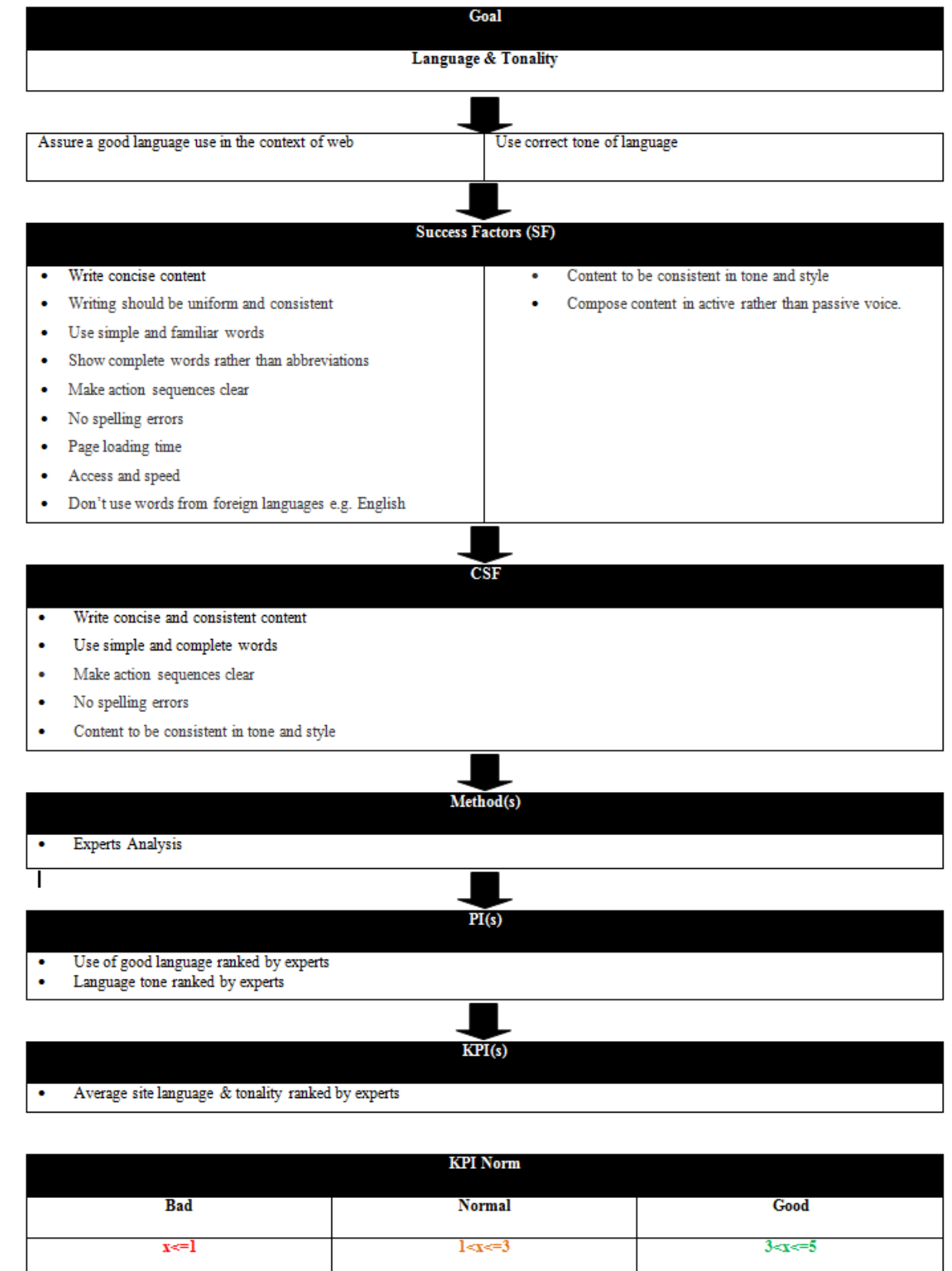


Table 9. KPI design based on the bank's user goal Language & Tonality

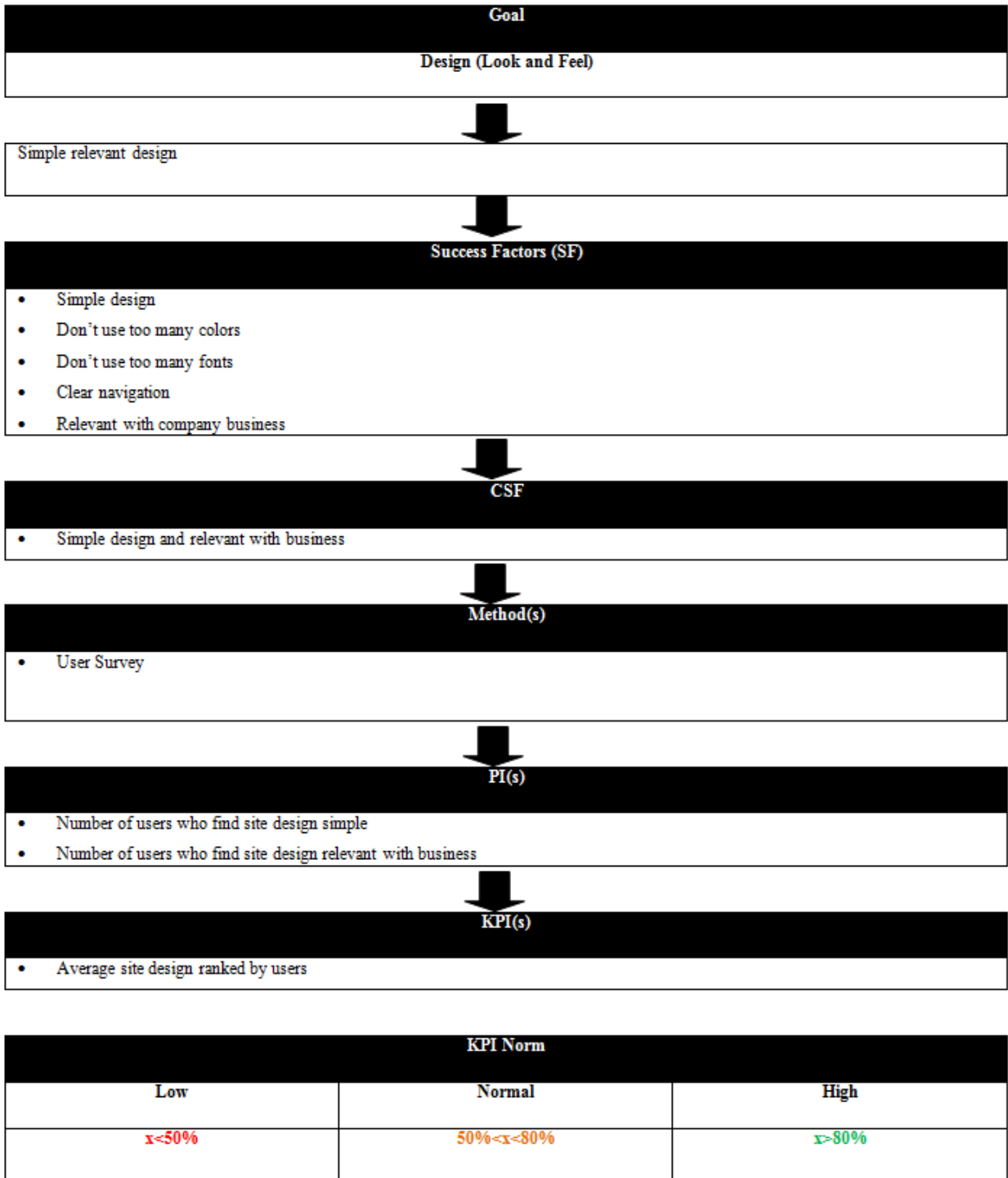
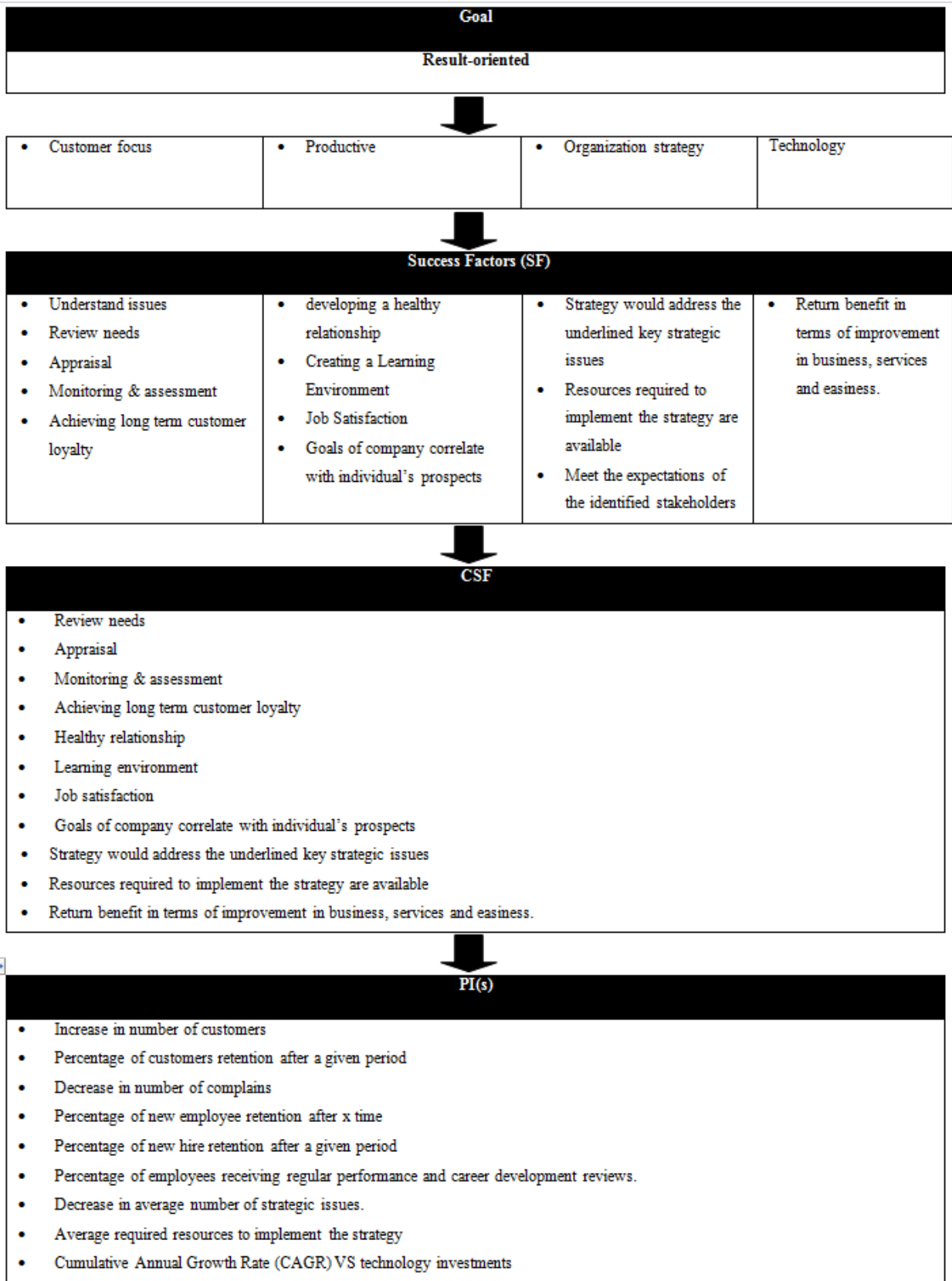


Table 10. KPI design based on the bank's user goal Design (Look and Feel)



↓

KPI(s)		
<ul style="list-style-type: none"> • Increase in number of customers • Percentage of customers retention after a given period • Decrease in number of complains 		
KPI Norm		
Low	Normal	High
$x < 50\%$	$50\% < x < 80\%$	$x > 80\%$

Table 11. KPI design based on the bank's business goal Result-oriented

_Result oriented

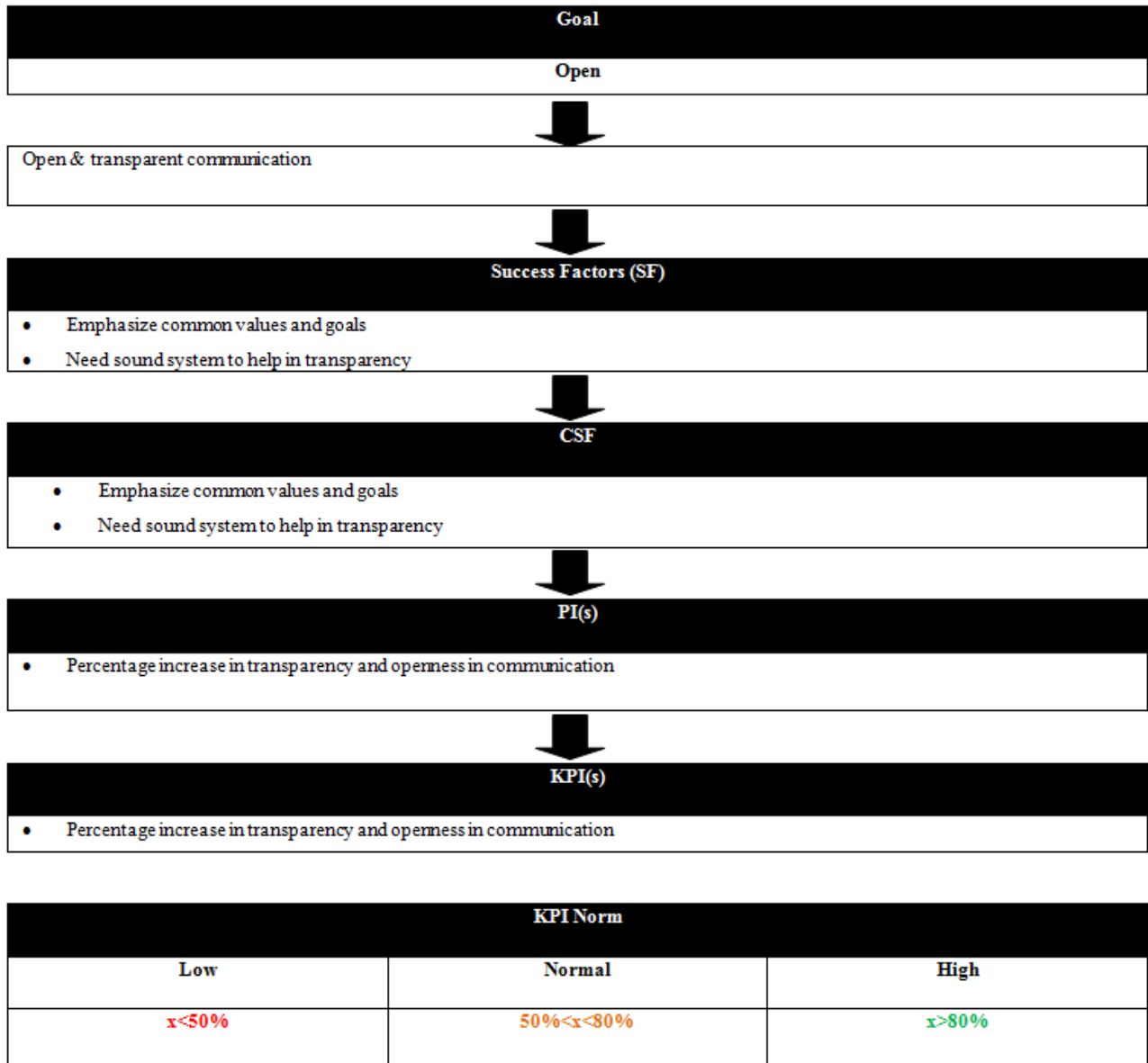


Table 12. KPI design based on the bank's business goal Open

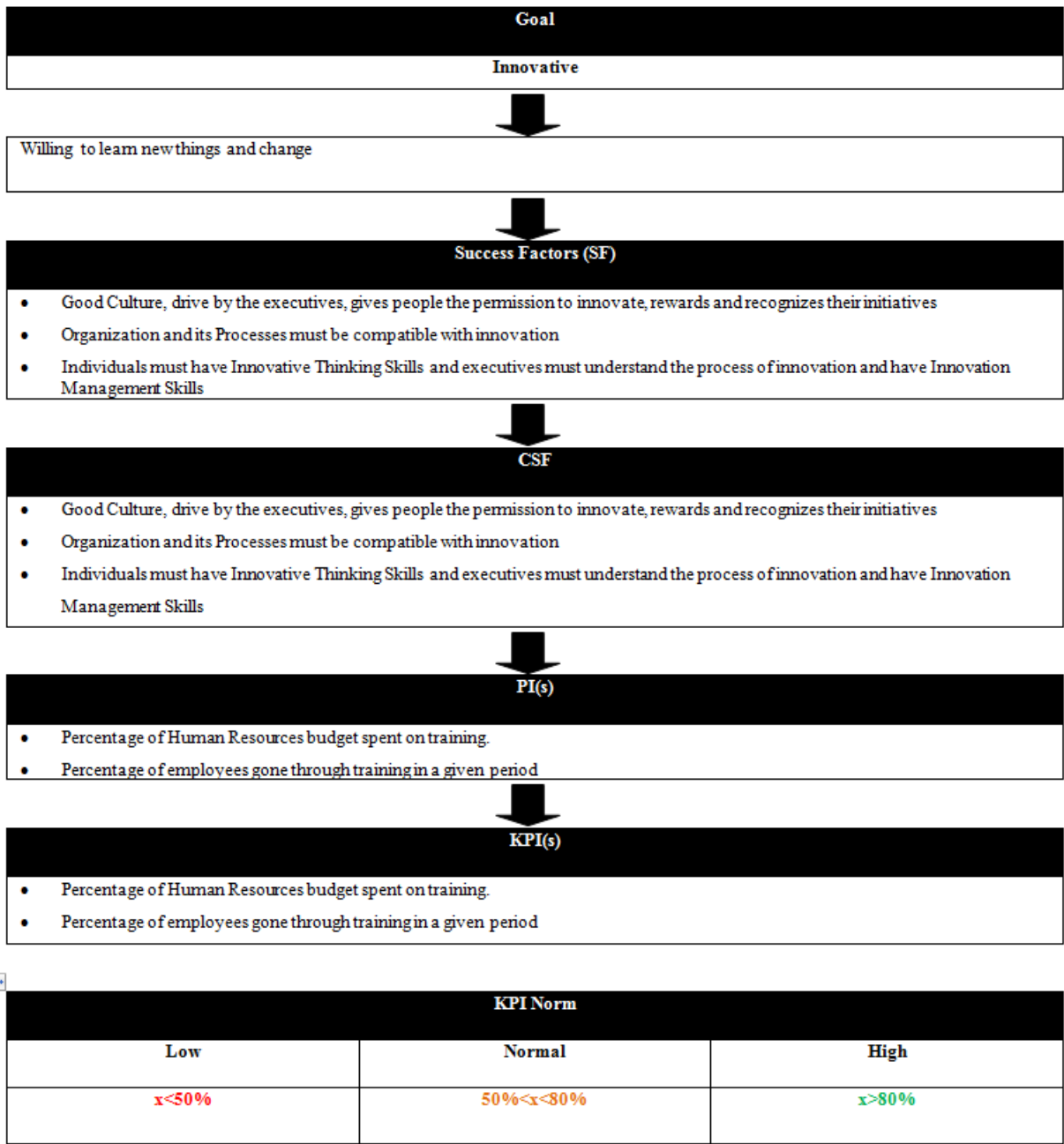


Table 13. KPI design based on the bank's business goal Innovative

6. Evaluation

This chapter presents evaluation of the method for KPI design

This chapter describes the evaluation of the method for KPI design. Two evaluations have been carried out, an empirical evaluation, described in section 6.2, and an evaluation based on informed argument, described in section 6.3. In section 6.1, the evaluation criteria are described.

6.1. Evaluation Criteria

In order to evaluate the objectives of the proposed method, we made the objectives of the method, presented in section 1.4, more concrete by specifying a set of criteria. These criteria are defined below, and categorized under respective objectives.

- **Objective: Generic**

- **Criterion 1: Independent of business domain:**

- It means that method is generic and can be applied in any domain

- **Objective: Step-by-step**

- **Criterion 2: Track the process:**

- It means that the method provides a step-by-step description of the process to design KPIs and support the user to trace back to any step in the process (e.g., if the users wants to see what they have been done in earlier steps).

- **Criterion 3: Differentiate types of goal:**

- It means that the method provides two different types of processes based on two different types of goals. First, “target accomplishment approach” which define KPI based on how successfully an organization is performing to reach to their target. Second, “maintenance approach “which define KPIs based on how successful an organization is performing to choose the right track for maintenance.

- **Objective: Clear**

- **Criterion 4: Identify duplicate KPIs:**

- It means that the method provides support in identifying duplicate KPIs.

Criterion 5: Fulfill KPI Characteristic:

It means that the method provides assurance that the identified KPIs fulfill the KPI characteristics

Criterion 6: Revise KPI:

It means that the method supports revision of KPI in a structured manner

- **Objective: Independent of Performance Measurement Experts**

Criterion 7: Independent of expert users:

It means that the method supports all domain experts to participate in KPI design process.

6.2. Empirical evaluation

6.2.1. Purpose of the evaluation

The empirical evaluation was carried out in order to receive feedback on the proposed method from practitioners working in this area. The feedback was based on the criteria, see section 6.1

6.2.2. Design of evaluation

In order to carry out the empirical evaluation, we prepared a questionnaire based on the criteria (attached in Appendix A). We decided that the evaluation should be done by a group interview with business stakeholders in the bank organization. Four stakeholders participated in the group interview for two hours. Out of these four, two persons were also part of the focus group that discussed our draft method, see section 4.1.2. All four persons have work with a method for KPI design used in the company. The currently used method in the company has not been documented. Therefore, identified KPIs are result of several brainstorming meeting with KPI expert in the company, and results were strongly depends on the participant's individual method. This result cannot be considered as a good practice. During the interview we came up with some questions not specified in the questionnaire which also helped us to make better and more refined evaluation of the proposed method.

6.2.3. Result of evaluation

In this section evaluation result with respect of criteria discussed in section 6.1 is presented. The result is the summary of the discussion in the group interview.

Criterion 1: Independent of business domain:

The currently used method in the bank practice is business domain specific, whereas the proposed method for KPI design seems to be generic and can be applied in any business domain.

Criterion 2: Track the process:

The currently used method in the bank practice is not systematic and the bank is not using any predefined structure to reach to KPI, the steps are not formulated and tracing back any step is not an easy job. For instance, if at the end of KPI design process the bank wants to identify the wrong action in a step, it is difficult to trace back what has been done/decided and who. The proposed method consists of clear and structured steps which make an easy trace back.

Criterion 3: Differentiate types of goal:

The currently used method in the bank practice does not differentiate between the goals, which is one of the main functions of the proposed method for KPI design. The proposed method differentiates between target and maintenance approaches

Criterion 4: Identify duplicate KPIs:

The currently used method in the bank practice does not identify duplicate KPI, which is one of the advantages of the proposed method for KPI design.

Criterion 5: Fulfill KPI Characteristic:

One of the drawbacks with the current method used in the bank is that it's not systematic. There is no methodology to assure that identified KPIs fulfill KPI characteristics. This problem causes a lot of costs to the company. After spending lot of time defining KPIs, many KPIs cannot return any practical data (numerical value). Therefore, the feature which checks the selected KPI fulfills the required and necessary KPI characteristics can be quite helpful and cost effective for the company.

Criterion 6: Revise KPI:

The structuralized steps in proposed method would be much more efficient in revising KPI rather than current method, since the KPIs are design according to a certain step-by-step method in the proposed method.

Criterion 7: Independent of expert users:

The currently used method in the bank practice needed participant who must be expert in business process area and have KPI design knowledge as well. The participant involved in KPI design process in the proposed method still must be experienced in their business process area but not necessary needs much knowledge on KPI.

6.2.4. Analysis of the evaluation

In the end of the group interview we had a discussion about implementing the proposed method. According to the interviewee, they are eager to adopt a systematic approach to be followed throughout the organization. They acknowledged that the proposed method can help them to define KPI in more structured way and can be applied in all departments in bank.

The empirical evaluation did not compare two or more well-documented and well-structured method for KPI design. This would have been preferably. Instead the evaluation compared a method for KPI design used in the company which is not well-documented and well-structured with the proposed method for KPI design, which aims to be well-structured. Therefore, the evaluation has limited value. More interesting would be to compare it to method for KPI design that aims to be well-structured.

6.3.Evaluation based on informed argument

6.3.1. Purpose of the evaluation

The aim of the evaluation based on an informed argument was to compare the proposed method for KPI design with the one method presented by David Parmenter, see section 3.2.2. Parameter's method aims to being well-structured method for KPI design.

6.3.2. Design of evaluation

The evaluation is based on informed argument, that is, the argument by the authors of this thesis. We have applied the criteria on the method for KPI design presented in this thesis and on the method presented by Parameter's method.

6.3.3. Result of evaluation

This section presents the result of the evaluation based on informed argument. In criterion 1, 5 and 6, both methods received the same result and in criterion 2, 3 and 4 .evaluation gave different result, i.e., , see Table 14 below.

Criterion 2: Track the process:

In the Parameter's method it is possible to track the process back but there are no defined steps between critical success factor and KPI. In the proposed method in this thesis there are clear and structured steps which make an easy trace back to any step.

Criterion 3: Differentiate types of goal:

In the Parameter's method there is no method to differentiate the goal types. In the proposed method after applying the method in a real case, we came up with the result of distinguishing the type of goals in KPI design process. To differentiate in goal types, proposed method define different approaches (i.e. Target accomplishing and maintenance approaches) to reach to KPI which provide more specific and clear structure.

Criterion 4: Identify duplicate KPIs:

In the Parameter's method there is no method to identify duplicate KPIs. In the proposed method one of the major successes of introducing supplementary steps is identifying the duplicated KPIs. In this approach after defining the CSF we will have the list of PIs. In any business area it happens that some goals have similar success factors even they have different targets and objectives, then these success factors ends to the same list of PIs and finally to same KPI. By using the proposed method we can recognize duplicated KPIs by having the same success factors. We claim that these steps will considerable lowering the cost (time/resource/budget) for KPI design in large organizations, although this statement has to be empirically validated.

Criterion 7: Independent of expert users:

To follow the steps in the Parameter method, the user need to be skilled in the area of KPI design. The reason for this is that the relations between the steps are not well-described and a non KPI expert cannot use the method. In the proposed method all the steps and their relations are well-defined. Therefore, it will be easy to apply by non-expert users.

6.3.4. Analysis of the evaluation

The basis of the proposed method is Parmenter’s KPI method and because of that the evaluation based on informed argument resulted in similar result for some of the criteria. Since we also aimed to enhance the Parameters’ method, the results also showed that the proposed method succeeded better in some of the criteria, see Table 14. A plus in this table means that the method fulfills the criterion and a minus, that it is not fulfilled.

Since the evaluation is based on the judgments of the authors of this thesis, which have designed the proposed method in this thesis, the evaluation based on informed argument has limited value. However, the arguments are openly stated and the methods are presented in detail, which means that the readers of the thesis have a possibility to make their own opinions.

Objective	Criteria	Parmenter’s KPI model	Proposed Method
Generic:	Independent of business domain	+	+
Easy to follow	Track the process	-	+
	Differentiate types of goal	-	+
Simple and clear to implement	Identify duplicate KPIs:	-	+
	Fulfill KPI Characteristic	+	+
	Revise KPI	+	+
Independent automation by non-expert users	Independent of expert users	-	+

Table 14. Empirical Evaluation Result

CONCLUSION

This chapter presents a summary of the thesis, a discussion of how the thesis' research question has been answered, as well suggested further research, and ethical consideration of the result.

This thesis presents a method for designing of KPIs. The background is that existing methods for designing KPIs are not easy to use for practitioners.

In the first step, we studied earlier research on this topic that led us to the development of a draft method. This method is based on the combination of earlier research and our own input. Our research work is mainly based on a method for KPI design by David Parameter.

In the next step we used a focus group for enhancing the draft method. The focus group gave us essential and efficient clues to further improve the proposed method.

The final method has been demonstrated by applying it based on data from a real-life case, from a bank.

The presented method aims to fulfill the following requirements: it should be independence from business domain; precise and easy to understand; it should provide a step-by-step description of how to design KPIs; and independence from experts in performance management so that practitioner can use it without having much knowledge in this area.

Two evaluations have been carried out in order to evaluate if the method fulfill the requirements. The first evaluation is done by carrying out a group interview with practitioners at the bank. The practitioners at the bank use their own method for KPI design that is not documented and not well-structured, and they claim that the proposed method for designing KPI seems to be generic, well-structured, easy to use and prevent users from designing non useful KPIs. The other evaluation compared the proposed method with a method designed by David Parameter. The evaluation was carried out by the authors of this thesis which discussed if and how these two methods fulfilled the stated requirements. The proposed method showed the following benefits compared to the Parameter's method: easier to track the process, it differentiate the type of the goals, it identify duplicate KPIs and it is independent of expert users.

Both evaluations had their drawbacks. The first evaluation is based on a group interview with practitioners experienced with a non-documented and non-well-structured method. The second

evaluation, comparing the proposed method with Parameter's, is carried out by the authors of this thesis, who designed the proposed method. We are of course biased since we were the ones that designed one of the methods.

Further research is needed to better evaluate the proposed method. Our aim is to do that in a comprehensive case study in one organization. To have more generalized model, there is a need to conduct case studies in different business domains and various sized organizations. Further research could also be to evaluate the method by using group interviews with practitioners across a large range of different domain organizations.

We also concluded from earlier research and experiences that most of the organizations succeeded in start by identifying and setting up the KPIs but with passage of time they leave the system or the system is not producing the desired results. Therefore, next version of the method could include a "Review KPI" part in our proposed framework to give attention to this problem. As organizations may change the priorities and factors in achieving their goals but they do not give any attention to revise the KPIs and measure the performance with the earlier setup KPIs. With passage of time these KPIs do not remain aligned with the organizations goals and helpless in measuring the performance which result in the failure of system and declined. There is always need to regularly monitor the KPIs to aligned with the organization goals and retain their relevance. Therefore regular monitoring and refinement of KPIs is one of the important factors of proposed model to ensure the success of organization in measuring their performance. This part needs further study as future work to provide comprehensive guidelines to monitor and refine the KPIs.

Research results have some ethical and social consequences which also applied to this thesis' results. The method proposed for KPI design also aims to define KPIs for measuring performance in an organization. This means that also employees performance can be measured, which in some of the cases employees can see as negative and try to avoid. When management wants to implement a KPI system, they need to communicate this to the employees so the employees can understand in which way the result will be used. This could be a part of an extended method which also includes implementation of the KPI system in practice.

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Appendices

Appendix A



Key Performance Indicators

This questionnaire is used to conduct interview of stakeholders involved in our case study.

Current approach for KPI identification:

1. Are you using any specific guideline for KPI identification?

- Yes
- No

Description _____

2. Are you satisfied with current KPI identification process?

- Yes
- No

If No, explain why _____

3. How much KPI identification team member are experienced in this area (the process of KPI selection)?

- No Experience
- Less than 1 Year
- 1 Year
- More than 1 Year

4. The current approach which you are using for KPI identification, can help you to find measurement methods ¹(Yes/No)?

- Yes
- No

5. The current approach which you are using for KPI identification, is easy to follow?

- Yes
- No

¹ Measurement method: Used to measure how running activities performing well or not. These methods should provide measurable entity as outputs to make possible for organization to realize the better maintenance activities to improve the performance

Description _____

6. In current approach which you are using for KPI identification, Is it possible to recognize duplicate KPIs ²(Yes/No)

- Yes
- No

7. Are you using any system for setting up identified KPIs

- Yes
- No

Description _____

8. By using current approach, are the identified KPIs fulfill the KPI characteristics?

- Yes
- No

Description _____

² KPIs which can be applicable to more than one goal at the same time