Improving the decentral performance management

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Main topic of the thesis

The central topic of this thesis is to come up with a set of KPIs for a team of company X. KPIs are measurable values used to evaluate the success of an organization, employee, etc. in meeting objectives for performance. The team consists of a number of functionaries (Employee who performs a defined function), the purpose of this study is to find a number of KPIs for each functionary that contribute to the goals of the company. These KPIs are then visualized using a dashboard. Determining a set of KPIs for the company's functionaries results in an improved decentralized performance management.

Purpose of the thesis

As part of the completion of the Bachelor of Industrial Engineering and Management at the University of Twente, a study was carried out at Company X in East-Holland, concerning the improvement of the decentral performance management. The research focuses on establishing a set of KPIs for the functionaries of team Y at company X and the visualization of these KPIs.

Company Introduction

Company X is a technical service provider located in East-Holland. With several branches in East-Holland it provides different sectors with its service. Amongst others, it provides housing corporations and hospitals with installation technology, service and maintenance. The company has Z different teams, each specialized in a different sector or aspect of installation projects (For example: Hospitals)

For this research, I will be focusing on team Y of company X. The teams of company X consist of around eight different functionaries, such as an engineer or a project leader. The board sets particular targets which every team should achieve. However, not every team always achieves the targets set. Company X does not have a proper performance management methodology by which they can monitor each team, identify problems and solve them.

The company is looking for a methodology to assess the teams based on a number of Key Performance Indicators (KPIs). They are aiming for a dashboard that displays the performance of each functionary. The implementation of the dashboard with KPIs will facilitate the assessment of both teams and functionaries on an individual level. Ultimately, it is expected that through the implementation of the dashboard, the problems in the teams can be found and solved. This will result in a higher number of teams achieving the targets set by the board

Problem identification

The main problem of company X is the fact that there is no performance management on individual levels of the company to monitor the goals which are set for the total organization.

This problem is caused by the fact that the performance per functionary is not insightful. Currently, there is no general method of measuring the performance of the functionaries. This is caused by the fact that there are no KPI's per functionary. The problem of having no KPI's per functionary is what I believe to be the core problem. The problem cluster is given in Figure 1. When every functionary has his/her own KPI's, the performance on every level and department is insightful. With this information every department can monitor their own functionaries and focus on the problems which influence the goals and ambitions of the company. In other words; performance management at all levels. Therefore, the core problem is:

No KPI's per functionary which (in)directly influence the companies' ambitions & goals.

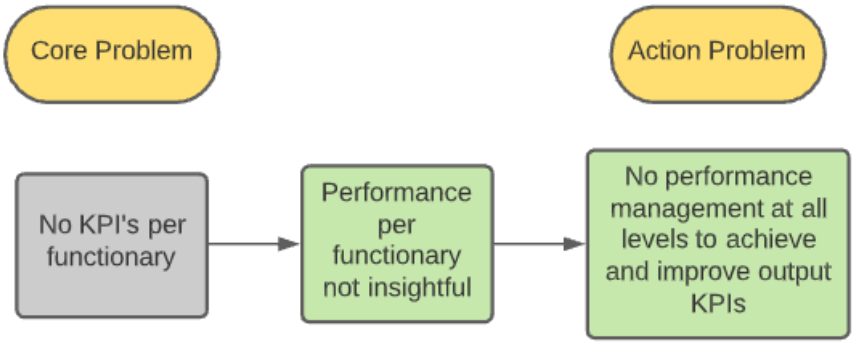

Figure 1 Problem cluster

Research questions

In order to solve the problem of company X (*No KPI's per functionary which (in)directly influence the companies' ambitions & goals*) the following research question is devised:

What KPIs should company X use for team Y to improve its performance management?

This main research question cannot be answered directly, so this question is divided into 3 sub-questions.

Research question 1

The first question focuses on the current situation of the company. It is important to have a good overview of the company's processes. This will give the research a well-structured start. The following research question is formulated:

What is the current situation of the processes in team Y?

The processes are mapped out by conducting interviews with the company's functionaries. Business Process Modeling and Notation (BPMN) will be used to represent the processes visually.

Research question 2
The second question focuses on the KPIs for each functionary. After understanding the current situation of team Y, research can be done on the best KPI's per functionary. The following research question is formulated.

What are the most important KPI's per functionary?

From interviewing, brainstorm sessions and literature research a list of possible KPI's is determined. The list of KPIs is narrowed down by a selection procedure. The KPIs are mainly derived from the database of the company which contains all the company's data. Finally, it is determined which KPIs correlate to which functionary.

Research question 3
The third question focuses on the implementation of the KPI's. After determining the KPIs per functionary, it has been decided how the KPIs will be used.

How to implement the use of KPI's?

By brainstorming with the management team and stakeholders combined with a bit of literature research, the requirements which the dashboard should meet are determined. Finally, the dashboards are designed. This research question is answered in chapter five.

Research design

A research design table (table 1) is created to give more insight in the design of this research.

Table 1 Research design table

Knowledge problem	Type of research	Research population	Subjects	Research strategy	Method of data gathering	Method of data processing	Activity plan
What is the current situation of the processes?	Descriptive	Team Y	Representative(s) of all functions	Contact, Field research, Broad	Interview, Brainstorming (cross-sectional)	Quantitative & Qualitative, visual representation	Identify staff members → Lit. study → Interview → Create BPM
What are the most important KPI's per function?	Exploratory	Team Y	Representative of all functions	Contact, Deep	Literature study, Analysis of primary sources, Brainstorming (cross-sectional)	Quantitative & Qualitative, reasoned selection of options	Solve KP 1 → Research → Literature study → Brainstorm → Overview best KPIs
How to implement the use of KPI's?	Explanatory	Team Y	Potential users of dashboard	Contact, Deep & Broad	Literature study, Interview / brainstorming, (cross-sectional),	Quantitative & Qualitative, overview methods	Solve KP 2 → Brainstorm → Implementation strategy → Create dashboard

Literature review

To conduct the research properly, a literary basis is needed. In this chapter, the main components of the research are discussed and substantiated through literature review.

Research question 1:

In order to answer the first research question (*What is the current situation of the processes in team IT & Security?*), a good understanding of the business processes in team Y must be achieved. Process Modeling is the graphical representation of business processes or workflows. Business Process Modeling (BPM) allows businesses to visualize business processes, allowing them to better understand and manage their internal business procedures.

The most common technique to Model Business Processes is Business Process Modeling Notation (BPMN). BPMN is a flowchart approach for mapping all steps in a planned business process from beginning to end. It is an important aspect of process management and provides a detailed visual overview of the work methods and information flows required to complete a particular process within a company.

BPMN language consists of a set of basic building blocks: Flow objects (events, activities and gateways), Connecting objects (sequence flow, message flow, association), swimlanes (pool and lane) and artifacts (data objects, group and annotation).

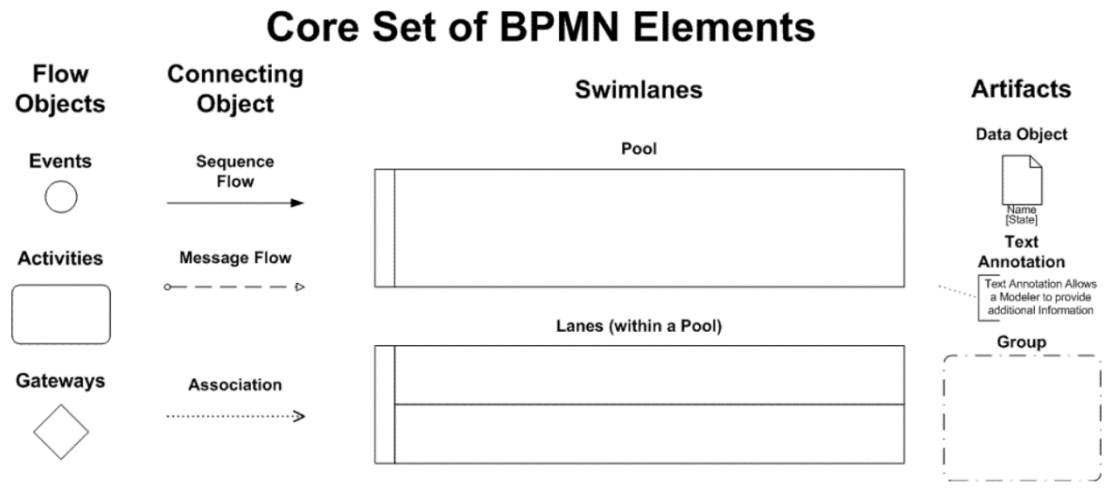

Figure 2 Core set of BPMN Elements

Research question 2:

Stakeholder analysis

To create a list of possible KPIs, two different data collection methods are used: Interviews with stakeholders and literature research. To determine the functionaries which are interviewed, a stakeholder analysis is conducted. In general, there are three steps to follow in Stakeholder analysis. First, determine who the stakeholders are for this project. The stakeholders of the project are the functionaries who are affected by the project, who have influence or power over it, and those who have a stake in its success or failure. Next, assess their power, influence, and interest to determine who should be focused on. Finally, gain a thorough understanding of the most essential stakeholders so you can predict how they will react and how to gain their support.

The stakeholder analysis is conducted by scoring all the stakeholders on power & influence and interest, after which they are placed in the Mendelow matrix. Mendelow suggests we analyze our stakeholder groups based on **power** (the ability to influence our organization strategy or project resources) and i**nterest** (how interested they are in the organization or project succeeding). The level of Power & Influence and the interest was assessed on a scale of [0; 10]. The higher the index, the more influence and interest there is about the project. The place (and thus also the scores) of the stakeholders in the team was assessed by the researcher, and later validated by the company.

Interviews

The semi-structured interview structure is chosen as the best option for the interviews. Semi-structured interviews mix closed and open-ended questions. The interviews took between an hour and an hour and a half. All of the interviews were recorded with the permission of the functionaries. The general structure of the interviews was as follows:

Going through process flows (BPMN models):

1) Going over the tasks + deliverables.
2) What inputs are needed per task
3) What output per task
4) How much influence per task

Other tasks/processes the functionary is working on and how much influence:

5) Which tasks/processes are these
6) How much influence does this person have on these and in what way

Interests for this functionary:

7) First start by going through the interests that can be linked to the goals of the company.
8) Then continue with interests that are maybe not directly linked to them.
9) Conclude by taking the information from the tasks/processes, the inputs and outputs and the interests and converting them together with the interviewee into possible KPIs. Ask what KPI's are most important to them and which they want to use in a future dashboard.

Selection of final KPIs

Chorfi et al. (2015) propose a method of selecting KPIs using Multi-Criteria Decision Analysis (MCDA). They use Analytic Hierarchy Process (AHP) as a MCDA method for ranking and selecting KPIs. “The Analytic Hierarchy Process (AHP) is a theory of measurement through pairwise comparisons and relies on the judgments of experts to derive priority scales. It utilizes pairwise comparisons to assess both alternatives and criteria according to the preferences of Decision-Makers.” (Chorfi et al., 2015). The advantage of using AHP as a MCDA method is that it does not require a huge amount of data and it converts the preferences of the DMs to numerical values according to a predetermined scale.

Chorfi et al. (2015) introduce a Multi-Criteria Decision Analysis framework for ranking and selecting KPIs. This framework is also used in this research to determine the final KPIs.

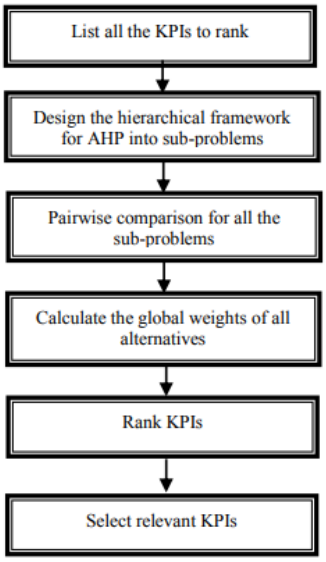

Figure 3 Multi-criteria Decision Analyis framework

Solution design

To tackle this problem, a problem-solving strategy must be determined. There exists many different methodologies which each have their own twist on the process. Design Science Research Methodology (DSRM) is a methodology for conducting design science research in information systems.

Step 1) Problem identification & Motivation

Find out what the problem is and why it is important by interviewing & brainstorming. The goal of this phase is to identify the problem in the company. This is done by interviewing the challenge provider and the team leader of team Y.

Step 2) Objectives of a solution

Not only is the problem identified during the brainstorming and interviewing sessions, the potential solution’s objectives are also discussed.

Step 3) Design & development

During this step, the artifact is created. The step is divided into three phases, each with their own research question. During this phase the research questions are answered.

Step 4) Demonstration

The dashboard(s) will be demonstrated to the board of the company by the researcher in this step. This follows the last research question in which the researcher comes up with the design of the dashboard.

Step 5) Evaluation

After the demonstration, the dashboard(s) will be evaluated on how well it solves the problem and if it is consistent with the objectives. This can be substantiated by means of surveys.

Step 6) Communication

The findings, conclusion and recommendations will be published on the website of the University of Twente and shared with the company.

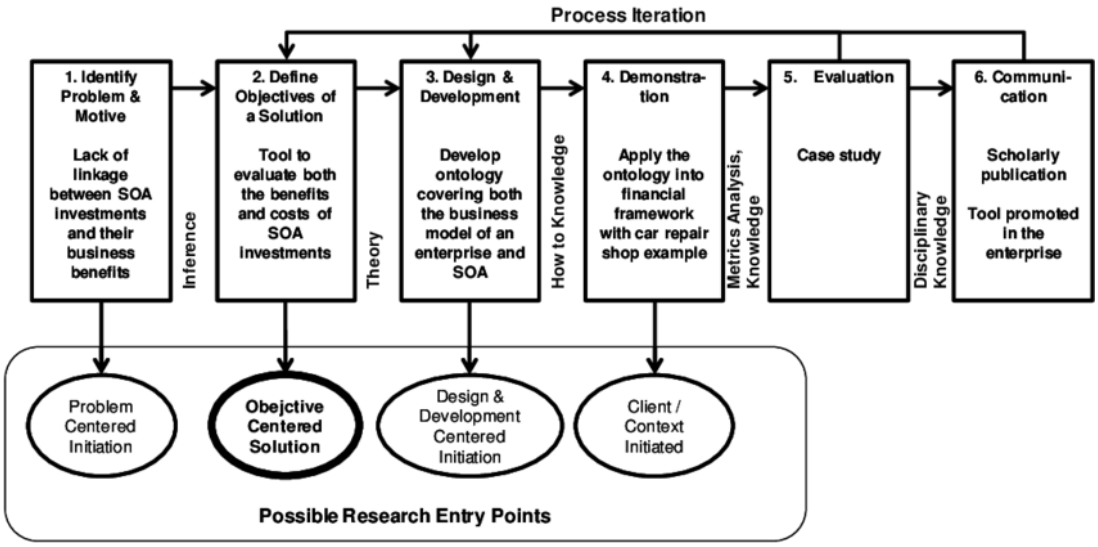

Figure 4 Design Science Research Methodology

Methods used for validation of the design

The Unified Theory of Acceptance and Use of Technology (UTAUT) model is used to evaluate whether a certain technology will be accepted within an organization. The article provides a list of statements that address the acceptance of the technology, in this case the dashboard. Not all of the statements from the article are used however, since the statements about social influence cannot really be answered at this time. Statements which were used focused on amongst others: Performance expectation, Attitude towards the use of technology and behavioral intent to use the dashboard. A brief summary of these responses is provided below. Each dashboard has been evaluated by their own functionary.

In general, the dashboard is considered useful by the functionaries and will allow them to perform certain tasks better. However, it is not expected that the dashboard will have such an impact that they will receive a salary increase. The effort expectation for the use of the dashboard is also relatively low, which is a good sign since implementation of a dashboard with a high effort expectation will usually lead to more resistance. This also corresponds to the attitude towards the dashboard, which is quite positive. The functionaries do not expect any problems when it comes to facilitating conditions. This can also be explained since a dashboard in Excel is currently used. The self-efficacy of the dashboard shows an average score, it is also fairly difficult to judge now whether tasks can be performed or not by using the dashboard. Fortunately, there is no fear among the functionaries about the use of the dashboard. Finally, the functionaries are fairly positive about the intention to use the dashboard in the coming time.

Discussion

The first point of discussion is the time constraint of the research. This research is being conducted as a Bachelor thesis which should take around 10 weeks of time. Because of the time constraint extensive research was not possible.

Most of the KPIs in this research came from interviews. The disadvantage of interviews is that the outcome can vary greatly depending on the interviewer and the interviewee. The researcher had no experience with interviews before this study began. This affects the reliability of the results and the method of interviewing. There will have been times when the interviewer should have asked questions or continued to ask questions that he himself did not see because of his inexperience. In addition to the interviewer, the interviewee also plays a large role in the reliability of the results. The functionaries were asked to some degree about their own performance and where it might have been improved or how it could be measured. It is possible that not everyone was equally honest while answering, but also that some functionaries simply forgot to share information.

During the research, the staffing of the team was not complete. The position of *functionary a* and *functionary b* was filled by one person and during the research *functionary c* left the company. This resulted in me being able to conduct 2 fewer interviews which may have resulted in less information being found than with full staffing.

Results

Due to confidentiality I cannot give more information about the results than explained in the conclusion part.

Conclusion

This research was conducted because company X was in need of an improvement in performance management. After examining this concern, a main question was formulated:

What KPIs should company X use for team Y to improve its performance management?

This question was answered in several steps. The first step was an analysis of the current situation of team Y. By means of BPMN models and the description of the functionaries, the current situation could be described. Then, by means of interviews with the functionaries, supplemented by literature research, a list of potential KPIs was made. In consultation with the management team, based on expertise and a MCDA (based on SMART principle), this list was thinned down to a final set of KPIs for the functionaries of the team. We conclude that the set of KPIs presented answers the main research question adequately. The KPIs are based on company X three goals. They provide the opportunity for each functionary to monitor their own performance. The management team can see if the team is running in line with the vision and goals of the company and can also manage in a more problem solving manner, by investigating the red KPIs. A total of 4 dashboards are created.

Recommendations

Based on the conclusion a list of recommendation is made:

- Currently, not all the data for the KPIs is available from the database. My recommendation to the company is to modify the database structure in order to be able to retrieve all the data necessary. Many functionaries currently use a separate tool to plan their work. I also recommend using the function in the current database such that all data is immediately available for a dashboard.
- This research focused on team Y; however, company X has in total Z different teams. My recommendation to company X would be to repeat this research for the other teams and thereby gain insight into the performance of the entire company at a decentralized level.
- The final recommendation is to use the set of KPIs determined in this research as a starting point for the next step of their performance management project.