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Report on field engineer experiences about task based earning model

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1. Preface

This report is a part of the results from the fifth funding period of the Finnish national research project “Smart Grids and Energy Markets”. The project has been funded by Tekes – the Finnish Funding Agency for Technology and Innovation.

This document presents the experiences on applying task based earning model for field engineers, based on the outcomes from previous work of Empower and our partners in SGEM program.

The report is based on the work performed in Empower Telecom Networks, and the pilot study was implemented in Tampere region, Pirkkala office. Support functions included HR, finance and legal personnel from the Empower Telecom Networks division and the Empower Group.



2. Introduction

Empower Oy is multinational service company which concentrates on improving the competitiveness of its customers by providing services in the fields of electricity and telecom networks, power plant and factory maintenance and upkeep and ICT-solutions.

Empower Telecom Networks (later on Empower TN) is a division of Empower Oy. Empower TN plans, builds and maintains electricity and telecom networks and provides service center, design and documentation services for its customers.

In this study Empower TN has studied the role of engineer field work in the smart grid environment. In particular Empower TN studies in this task the effects and experiences of task based earning model in task coordination of Empower's own field engineers and subcontractors. Earlier internal studies had shown potential for value gain by utilizing the task based earning model, especially in the Turku region. Practical studies, however, were never implemented in the Turku region due to time and work load constraints. This study continues the work done in the SGEM research project in line with the themes of 4 Financial Period. The objective is to demonstrate new business models in real life work ecosystems.

This deliverable studies the effects of the task based earning model in real-life environment by experimenting the model in a pilot study organized in Tampere region, Pirkkala office. The internal pre-studies done in the Turku region case laid the ground work which the Pirkkala study is built upon. The pre-studies suggested that there might be growth possibilities for the business and employee value experience. The pilot study described in this deliverable will test these implications and opportunities proposed by the task based earning model as the basis of new business model.

This deliverable will provide the reader with the description of basic principles of the task based earning model and the processes and tools which enable the task based earning model in the field of field engineer management. The task based earning model is then compared against the "business as usual" –case. The business as usual case is the current earning model which is based on the hour-based earning model. The hour-based earning model will be used as the baseline for the study and will act as the comparison point when measuring the performance of the task based earning model.

The performance of the task based earning model will be measured in this study by studying how the task based earning model increases the work related satisfaction the field engineers experience and how the value of the work done by the field engineers develop. The study will also present challenges which were discovered during the study and which had to be solved in order to make the task based earning model work.

The structure of the document is following, in chapter 3 the theory behind task based earning model is presented and why it was chosen to be implemented in field engineer related tasks. Chapter 4 presents the objectives of the study and shortly describes the expected results of the research topics. In chapter 5 the structure of the pilot study and the methods used for the research are described. Chapter 6 concentrates on the results of the pilot study and to the possibility of expanding the pilot study to other units inside Empower TN along with risk analysis of possible risks. Chapter 7 presents the conclusions of this deliverable based on the pilot study and suggests possible next steps for the research in this area. Chapter 7 also contemplates if



the task based earning model could be expanded to other businesses and what kind of risks could be discovered when the task based earning model is applied to other business types and how the risks could be avoided.



3. Objectives

The objective of the pilot field study is to gather experiences and data of the task based earning model in a real life work environment. The pilot study concentrates on evaluating the task based earning model on four different areas.

The first objective of the study is to examine how task based earning model affects the way how field engineers self-steer their work schedule according to the tasks available for them. The reasoning for this study objective stems from an interest between the engineers and the company to enhance the work efficiency and value through the work and at the same time increase the value the field engineer experiences through more meaningful earning model. The objective aims for studying the possibility of replacing the current way of working with self-managing teams by replacing the hour-based earning model with the task based earning model.

The second objective of the study concentrates on measuring how the task based earning model will work in a real working environment. The task based earning model will be measured by comparing the value created by the field engineer before the pilot study and after the pilot study. Also, in addition to the data gathered through IT-systems, the field engineers are polled on their opinions and experiences of the task based earning model to learn how the model affects the value the field engineer's experience.

The third objective of the study concentrates on gathering more data on the actual performance of the task based earning model and gathering information on how the task based earning model has to be adjusted to be more suitable for use in smart grid –like tasks all around Finland.

The fourth and last objective of the pilot field study is to recognize if it is possible to create a win-win situation between both parties, the field engineers and the employing company, by increasing the monetary value each of the parties' experience from the task based earning model. The main idea behind this study objective is to learn if the revenue of the company can be increased with the same resources while keeping the profit margins at the same level. If the task based earning model can create increase in revenue and profitability the field engineers will be compensated through profit sharing mechanism at the end of the pilot period.

The next chapter concentrates on describing the set-up of the framework in which the pilot study is arranged. The chapter consists of describing the task based earning model, how the pilot study is arranged and what are the methods for estimating the results of the study.



4. Setting up the framework for the pilot study

The framework for the pilot study is based on basic theory of the task based earning model and practical arrangements of the pilot study alongside new IT-systems which enable the application of the task based earning model with task steering among field engineers.

The following sub-chapters concentrate on describing the task based earning model, the pilot study structure alongside the related IT-systems and processes and the methods used to evaluate the outcomes of the pilot study.

4.1. The baseline case and introduction of the task based earning model

Before describing the task based earning model the previous setup which will act as a baseline for the pilot study will be reviewed briefly. The baseline case is based on the business as usual model where the field engineers were paid hourly with a fixed price over a fixed work time. The field engineers had also a fixed amount of work requests for the work day which results into a model where the most willing workers are not working at the optimal capacity they could and therefore might feel unmotivated at times. The figures describing the work value and work satisfaction will be presented and analyzed in more detail in chapter 5 which describes the pilot study when it has been initiated.

The new task based earning model piloted in this deliverable will propose few key-changes onto the work methods of the field engineers presented in the baseline case, while enhancing self-control of the work amounts by introducing new IT-systems to help the coordination of tasks for field engineers. The basic idea of task based earning model is that each of the tasks are predefined with a value and each of the field engineers create value for their unit by completing tasks. The amount of completed tasks is then compared to the elapsed time and through this comparison the value created by the unit is calculated.

The goal is to achieve better self-steering of the work among the field engineers, increase motivation to perform better in the tasks, increase the meaningfulness of the work and add flexibility and productivity. These are seen as activities which increase the value the work creates and thus increases the revenue and profitability of the actions. To encourage workers to participate into the task based earning model the workers are compensated by a profit sharing mechanism which creates a win-win situation for both of the parties.

To enable the task based earning model a few basic tools need to be introduced to the process how work is steered among the field engineers. The value creation in the task based earning model is based on the tasks completed and the time used as described above. In order to achieve efficient levels of performance within these parameters certain flexibility has to be introduced to the work processes. For example, the new task based earning model presents a possibility for the most willing workers to reach their most optimal capacity in their work routine by presenting them the opportunity to flexibly steer the amount of work they do during a workday to achieve as many completed tasks as they can.

This is done by enabling more flexible work days which may vary between 6h – 10h depending on the workload the field engineers deem necessary. The overall work hours stay the same as in the baseline case in the long



run, but the new task based earning model presents the possibility to allocate extra hours to a buffer which can be utilized when the work load is smaller.

In addition to increasing the flexibility in the work regime of the field engineers a new IT-system for enhancing self-steering of work schedules will be introduced for to be utilized by the field engineers. The new IT-system utilizes context related data gathered from the supporting IT-systems and the surroundings of the field engineer. This enables the IT-system to suggest new work orders for the field engineer near the site he is already working and thus creates more flexibility to the work routine.

By combining the methods described above we get the tools which enable task based earning model in its full potential in the case of field engineers. This chapter concludes the short description of the task based earning model. In the next chapters the framework of the study pilot is described in more detail.

4.2. Description of the pilot study for task based earning model

The task based earning model will be piloted by Empower TN's Installation & Maintenance unit in the Tampere region, Pirkkala Office. The Pirkkala office mainly serves three main telecom operator customers by offering them services in installations deliveries and maintenance. The pilot will focus on monitoring the development of work value among the field engineers of the Pirkkala office.

The monitoring concentrates on the average values created by the whole team, since in previous studies it was found that monitoring the value created by a single field engineer proved to skew the results between the engineers and cause motivational issues. This was the result of uneven possibilities to reach the same work value levels, since for example simply working in different areas such as city center or a municipality would produce different values for the workers.

Before the pilot study starts the field engineering unit will be defined a specific baseline which will be compared to the outcome of the pilot. The baseline for the study will comprise of field engineer specific revenue and work value from March 2014 to January 2015. If the unit is able to increase the work value they create compared to the baseline they will be compensated by the profit sharing mechanism described in chapter 4.1.

The pilot study will be organized between 23.2.2015 and 19.4.2015 and its total planned length will be two months. During this time the field engineering unit of Pirkkala will get normal monetary compensation for their work done in the pilot, but at the same time the work value averages are calculated for the whole unit to gather data of the pilot.

The next sub-chapter gives an explanatory description of the process utilized in the pilot study for the task self-steering among the field engineers.

4.2.1. Process description for a self-steering task operation

The self-steering process of the task based earning model is strongly built upon the assisting possibilities of an IT-system called ETAdirect. ETAdirect is a field service management software which functions in a private cloud and integrates to the existing work steering systems of the organization. (TOA Technologies, 2015)

The basic process can be described through the following example illustrated in figure 1 below:

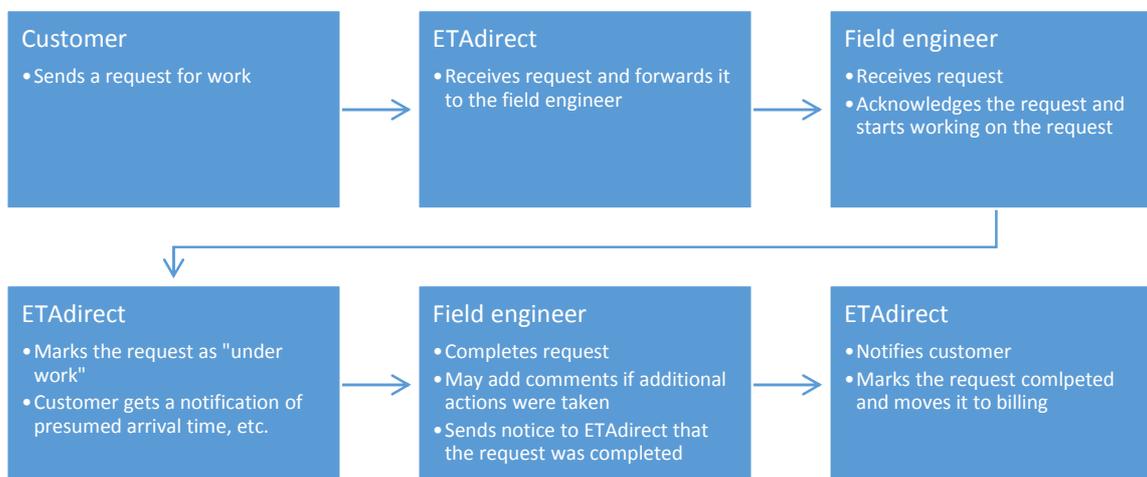


Figure 1 Description of the process behind the request handling in task based earning model.

Based on the figure 1. the process is following:

- The customer, in this pilot study a telecom operator, sends a ticket to the ETAdirect which translates into a request for work.
- The ETAdirect system then notifies the field engineers within the request location based on such parameters as distance to the request site and the amount of scheduled work in their calendar.
- Now, the field engineers have the possibility to acknowledge the request and add it to their work schedule if they deem so.
- In a case where the field engineer accepts the work request the ETAdirect system marks the request as “under work” and notifies the customer that the request has been accepted and provides an estimate when the field engineer arrives to the request site.
- When the field engineer completes the request he or she marks it completed on his PDA device and this sends a notification through the ETAdirect system to the customer that the request has been completed. In a case where the field engineer has to do additional work and additional billing, he can describe the additional work through his or hers PDA device and the ETAdirect will send this information to the customer.
- When the engineer has marked the request completed the ETAdirect moves the request for the billing department to be processed and billed accordingly.

The process described above will act as the basic process the field engineers carry out throughout their work day for each of the tasks they complete. The process has been designed so that it can be repeated over and over again without hindrance and wasted time. This principle enhances the ability of the field engineer to chain tasks together easily and self-steer the amount of work he or she does. By giving these tools to the field engineers the optimization of their work capacity is in their own hands and the profit sharing mechanism will act as the inducement to optimize their workload.



4.3. Methods for analyzing the results of the study

The results of the pilot study will be analyzed by using two different methods. The first method will analyze the data gathered by the IT-systems. In this analysis the data related to the baseline case will be compared to the task based earning model case. The analysis concentrates on such values as the tasks completed during a work day and the amount of time used for completing the tasks.

The second method for analyzing the results from the pilot study will be an opinion poll which will be gathered from all field engineers participating into the pilot study. The poll will measure the attitudes towards the task based earning model and at the same time gathers feedback on how to improve the task based earning model from the viewpoint of the field personnel.

This sub-chapter ends the framework description for the pilot study. In the next chapter the data analysis related to the pilot study is explained and the hypotheses for the objectives set in chapter 3 are presented.



5. Piloting the task based earning model

This chapter presents the baseline values used as the basis for the comparison of the hour-based earning model and the task based earning model. This chapter also sets a set of hypotheses for the objectives presented in chapter 3. The reasoning for presenting only hypotheses for the research objectives is that the pilot study has been only running for a week and reliable results can be expected earliest at week three of the pilot study.

However, it should be noted that during the planning phase of the pilot study with the field engineers, the ascending motivation levels could be clearly seen from the staff. The excitement of the staff culminated into the whole Pirkkala unit into enrolling to the pilot study voluntarily. The staff consisting of field engineers noted, that earning models which promoted more efficient working with higher payouts seemed interesting and worth experimenting.

In service business, where the assets of the company comprise wholly of the staff of the company, it is really important to promote entrepreneurial approach into the way the business is run. Put simply, the business activities in service business comprise of two components: Our staff and our Customers. The staff and the customers form a bond via contracts between them and form the basis for business. In order to be able to create sustainable and growing business it is important to handle these bonds with efficiency and quality they deserve, because these are what create the value for the customers and the company.

It is hoped that this pilot study produces a positive confirmation for the shared vision that it is possible to create sustainable new earning model, where creating a win-win situation between the both parties is possible.

5.1. Baseline values

The performance of the pilot study is measured by two different indicators already briefly introduced in chapter 4. The first indicator is the value of work, while the second indicator will be the work satisfaction polls. This chapter presents the baseline values, which were collected during the baseline time period from March 2014 to January 2015.

5.1.1. Value of work

The first measurement indicator, which is the value of work, can be collected by utilizing the data collected from the IT-systems. The specific data which the value for the work will be calculated comprises of two components. The first component gathered from the data is the revenue created by the field engineer from completing the tasks. Each of the tasks have a certain value defined for them and by summing up the values from the completed tasks the revenue generated by the field engineer can be calculated.

The second component for calculating the value of work is the time used for completing the tasks. The time component acts as a two-way value coefficient. For example if the amount of tasks the field engineer completes is constant the time component can either increase or decrease the value gained from the tasks. The longer the field engineer takes to complete the tasks the lesser the value created by the tasks and on the

contrary, the shorter amount of time used by the field engineer to complete the tasks the higher the value gain is.

The above described components are then combined to get the value of the work the field engineer carries out. The baseline values for the value of the work can be seen in figure 2.

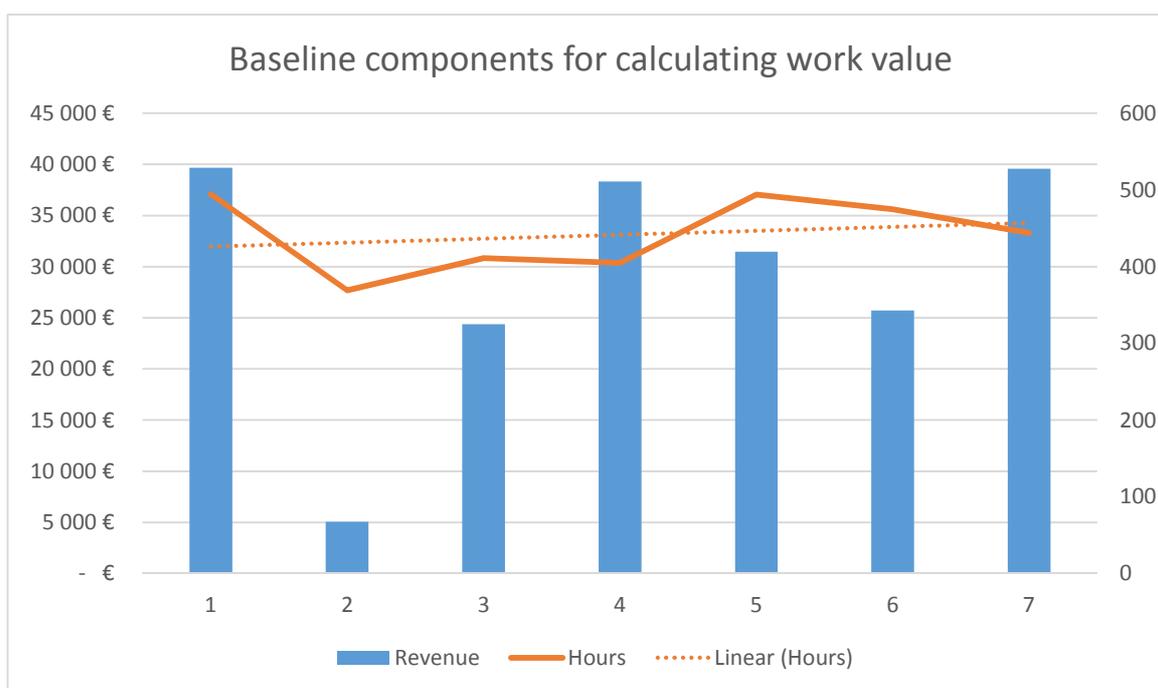


Figure 2 illustrates the value components of the field engineers work during the baseline time period.

As can be seen from the figure 2, the revenue accretion done by the individuals is very volatile compared to the hours carried out in the baseline time period. The figure 2 also illustrates the problem created by the hour-based earning model which was used for the baseline time period. Being paid by the hour does not motivate to accrue revenue, since the revenue accretion is not tied to the earnings. That being said, the seemingly lower revenue accretion numbers may also be explained by the long distances between the work sites.

However, the earnings level presented in the figure 2 is the baseline used for valuing the value of the work the field engineers will create during the pilot study period.

5.1.2. Work satisfaction.

The second measurement indicator, the work satisfaction, is measured by arranging bi-weekly polls to the field engineers. The bi-weekly polls concentrate on the experiences the field engineers experience during the pilot study. The field engineers are polled on following topics:

- Has the relative strain from the work increased?
- Is the work more challenging or demanding than before?



As the polls measure the work satisfaction, at the same time the field engineers are queried for improvements and adjustments to the task based earning model. Through this way the model can be adjusted during the pilot to better correspond the real life work environment.

During the pilot study the experimenting unit of field engineers will be given the opportunity to voice their opinion on changing the size of the unit based on the work load and the ability of the co-workers to optimize their working capacity.

5.2. Hypotheses set for the objectives

Since the pilot has only been running for a week this deliverable present hypotheses for the most relevant research questions which have already gathered some experiences. The full list of the research questions can be found in chapter 3. The hypotheses presented in this chapter mainly concentrate on the objectives 1 and 2. It should also be noted that the hypotheses listed in this chapter illustrate the expectations of the parties involved in the pilot study.

The first objective of the pilot study concentrated on finding out how the task based earning model affects field engineers' way of working. The hypothesis for this objective is that the self-managing or steering of the field engineers' work will increase during the pilot study. Early experiences are already indicating that the self-steering has improved and the workers are taking the initiative in developing the self-steering model by tackling the difficulties experienced on the field.

The second objective concentrated on measuring how the task based earning model will work in a real working environment. The hypothesis formed for this objective anticipates that the task based earning model increases the satisfaction experienced by the field engineers, since allowing flexible work time management has a clear effect on how the field engineers manage their own time. Preliminary results already suggest that the working environment has experienced a positive raise in the attitude thanks to the flexible work time management, mainly because it has an effect of removing the feel of inequality between the workers.

As can be seen from the preliminary result gathered from the field engineers at the start of the pilot study the expectations for a successful pilot study are high. Naturally, more time on studying the effects of the task based earning model is needed to get the full picture and to analyze the positive and negative effects the model has on value creation among the field engineers and the company.

This concludes the chapter describing the practical aspects of the pilot study. In the next chapter the preliminary results are gone over in a broader context along with the next steps of the pilot study.



6. Conclusion and next steps

This chapter will present the already discovered issues related to the task based earning model and possible solutions to solve the issues. This chapter also discusses the next steps of the pilot study and possible expansion of the task based earning model to other units in the Empower TN.

The pilot study has presented already one issues which was briefly mentioned in this deliverable earlier in chapter 4. The issue concerned measuring the value of work an individual field engineer creates. By only examining a single individual as a unit the results of the value creation can get strongly biased by only the location where the individual is working. For example an individual working in a city is able to move more quickly from task location to other, while an engineer in a rural area has to travel long distances between task locations. If the timeframe for both of the engineers is constant, the engineer in the rural area is unable to complete as many tasks as the engineer in the city center, since most of his time will be spent from moving between task sites.

To solve this discrepancy, the unit size of the observed unit was increased to comprise of a full team of field engineers. This way factors such as distances or the difficulty level of the work wouldn't work against individual field engineers. It has also been noticed that by creating flexibility to the way of working, the unit has created its own rules of conduct for achieving better performance as a unit. It has also been noticed that the unit has become self-governing and self-motivating in order to achieve better optimization of the capacity the unit holds. This can be seen as a very useful trait in the organizational skills of the unit as it optimizes the efficiency of the unit and frees resources to other tasks inside the organization.

The self-managing trait also optimizes the unit sizes from within, since the engineers of the unit manage the workloads they experience and if they experience the work load to be more straining, they can suggest for additions to the unit. This also work in the other direction, if the engineers in the unit experience that there is not enough work for everyone they may suggest on reducing the amount of persons in the unit. This kind of trait removes the need to have co-operation negotiations between the company and the engineers.

6.1 Next steps in the pilot study

The next steps in the pilot study will consist mainly of continuing the pilot study and expanding the piloting to other units inside Empower TN. The immediate target in the pilot study is to test the hypotheses set in the chapter 5. It is also intended that during the piloting study period answers will be found to the research objectives set in the chapter 3 of this deliverable.

After the pilot period Empower TN is going to study on expanding the pilot to other units inside its organization. The objective is to compare the results gained through the first pilot to other units and to see if varying conditions will have an effect to the results of the pilot. These extended studies will also concentrate on finding and solving possible negative experiences found out by the study.

The objective of this extended piloting is to gather more experience of the task based earning model and to produce data to support decision making on subjects such as is it possible to extend the task based earning



model to whole organization and is the new type earning model viable solution to the older hour-based earning model.



References

TOA Technologies (2015). *ETAdirect Enterprise: Powerful, Customizable*. Retrieved February 24, 2015, from <http://toatech.com/field-service-management-solutions/etadirect-enterprise/>