

# **ENHANCING FACILITY SERVICE PROCESSES IN GOVERNMENT OFFICES THROUGH STANDARDISATION**

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## **ABSTRACT**

As many other organisations, the Finnish government aims at efficient office use and supporting the core activities of its agencies. This demand has pushed the government real estate organization to develop its facility management service processes. This paper focuses on a process that develops solutions for the agencies. The service process is currently under standardization in order to use it efficiently and to increase the quality of the services nationwide. In this paper, the aim is to analyse the process under standardization from lean management perspective to identify key areas of future development.

The process under standardization is studied via multiple case studies including three case processes. The main data material consists of process materials, such as memos, contracts and minutes, and interviews.

The analysis identifies three issues that require special attention in order to avoid limiting the value creation in the process. First, standardisation should be developed in the separation of requirements from solutions. If a solution becomes a requirement, the process will most likely be disturbed. For example, to match the solution of own rooms to an open plan office is more difficult than to match the requirements of increased feeling of privacy and co-operation. Second, standard information inputs should be qualified in order to avoid making-do. Currently, making-do interrupts the service process. Finally, the standardisation should cover at least information inputs, operations, and the order of operations.

Standardisation of the process is a critical step to increase efficiency. However, standardisation requires a careful examination and continuous improvements to avoid standardising waste and value losses.

## **KEYWORDS**

facility management, standardisation, orderliness, value creation, process, multiple-case study.

## **INTRODUCTION**

In the current business cycle, private and public organisations are eager to find ways to reduce costs. Because real estate related costs are typically the second biggest business expense of organisations (Edwards and Ellison 2004), real estate costs gain a special attention in cost reduction. However, the cost reductions should not cause

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losses in other domains such as in employee satisfaction, health, or productivity (e.g. Lindholm 2008, Jensen et al. 2012). This is one of the reasons why a government-owned public utility that manages and maintains the government facilities in Finland has begun to standardise and develop its processes, namely a facility management (FM) service process that develops comprehensive solutions for government agencies. In this paper, the focus is on the standardisation of this process. The aim is to analyse the process under standardization from lean management perspective to identify key areas of future development. The process is hereafter called *the FM service process*.

The FM service process is studied through three case processes. The cases were selected to cover well-flowing and less well-flowing processes in order to identify the key areas of future development. Written materials such as memos, presentations, agreements, minutes, proposals, reports, and drawings were collected, and interviews were conducted to visualise the case processes. After the visualisations were validated, cross-conclusions were made to develop the process.

The paper is divided into four sections. After the introduction, the theory section discusses standards and standard operations. In the third section, the key areas of future development are presented. Finally, conclusions are drawn.

## STANDARD OPERATIONS

There are two key terms in this study: standardisation and operations. First, standards are often misunderstood in the real estate sector. In this study, standards are defined after Imai (1997): standard is a way to do the job “*the safest and easiest for workers and the most cost-effective and productive way for the company to assure quality for the customer*”. Second, in this study operations are defined after Shingo (1989): operations refer to actual transformation of input into output. Typically there are series of operations in the production process.

By combining these two key terms, operations are standardised. Imai (1997) talks about operational standards and Shingo (1989) about standard operations. By these terms, both authors suggest that standardisation of operations presents the best, known method of conduction a task. Shingo (1989) explains this through three temporal aspects: (1) past, (2) present and (3) future. First, past standard operations refer to the operations that used to be standard. The employees have developed new, better standards. Present standard operations are the currently used standards that new employees are trained to follow. The last one, future standard operations, are the standards under development. For example, the differences in cycle times can imply that the present standard operations are not the best ones.

The lack of standards and lack of following standards results in variability (Imai 1997). In other words, standardisation can be seen as an antidote to variability (Morgan and Liker 2011). According to Koskela (2000), variability creates an upturn in cycle time. For example, if the standard way of working is not followed, the outcome most likely will not be in line with the quality requirements of the organisation. If the quality is not on the target level, rework must be done. Rework, on the other hand, increases cycle times. According to Takeda (2011), longer and shorter cycle times usually indicate lack of standardisation. However, Shingo (1989) has specified that fixed times do not ensure that the job is conducted in the same way: the job can be done in a different way in the same time. Therefore, to beat or exceed the cycle times can indicate lack of standardisation but the achievement of standard cycle times does not necessarily mean that standardisation is followed.

Without standardisation, it is challenging to synchronise the service processes (Morgan and Liker 2006). By minimising waste and further standardising the new way of conducting a task decreases the variability in the process. According to Takeda (2011), the power of standardisation is captured when a flow production is established.

## **RESEARCH METHODS**

The process owner is a government-owned public utility that manages and maintains the government facilities in Finland. Its 4,6 billion euro property portfolio includes 6.5 square meters of space.

In this research, the FM service process, which is currently under standardisation by the process owner, is studied through three case processes. The case processes were selected based on four criteria:

1. **Case process must be complete.** To visualise the case process, it was required that the case process is already complete. However, it was not necessary that the actual construction phase is complete, because construction is not part of the FM service process.
2. **Case process must offer detailed information.** The visualisation requires detailed information and thus only cases that can provide detailed information in written and spoken forms were selected.
3. **Case process must include workplace management aspect.** Because of the focus of this research, all cases were selected to cover services relating to workplace management.
4. **Case processes must offer a view on well flowing and less well flowing processes.** To develop the FM service process, the case processes were selected to cover two processes that included extra twists and turns and a process that had fewer twists and turns.

The research process is divided into two: conducting case studies and drawing cross-case conclusions for process improvement (Figure 1). Next, the research process is presented in more detail.

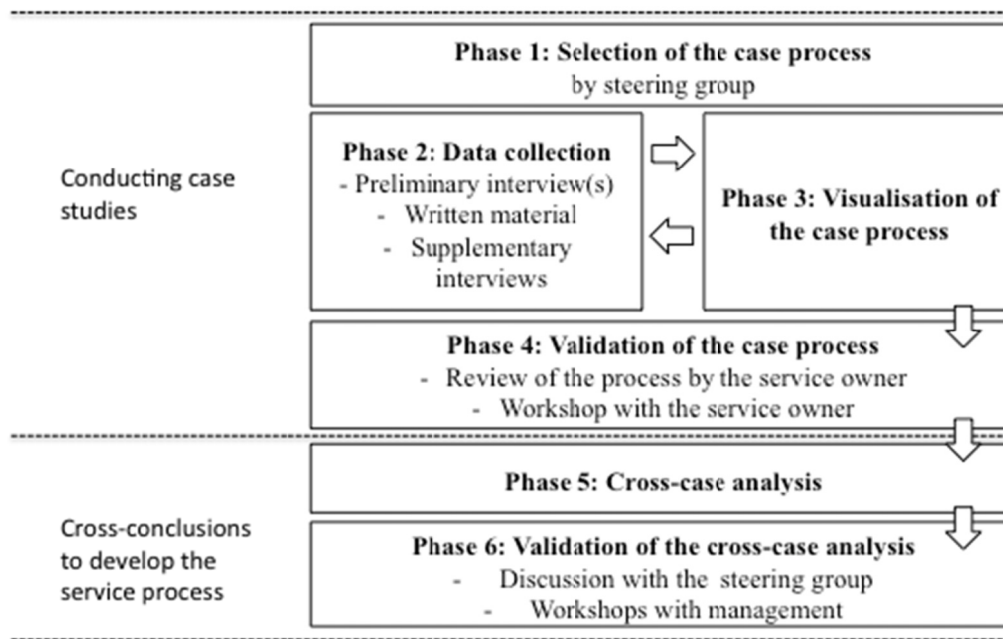


Figure 1: Research process.

The data collection and analysis followed the same procedure in each case (Figure 1). After the case was selected (phase 1), the data collection started with preliminary interview(s). In the preliminary interviews it was also discussed and agreed what kind of written material can be used in the analysis. The written material included a variety of project materials such as memos, presentations, agreements, minutes, proposals, reports, and drawings (phase 2). The first versions of the visualisations were made based on the written material (phase 3). The visualisations were then supplemented based on interviews with the employees who worked in the case process. After this, check-up meetings were arranged with the same employee(s) as earlier to discuss the accuracy of the supplemented visualisation (phase 2). After this, the visualisation was presented and validated in a workshop where the employees from the particular process could comment on the visualisation. The employees had also a chance to comment the visualisation via phone or email.

Table 1: Data collection in each case.

<b>Data collection</b>	<b>Case A</b>	<b>Case B</b>	<b>Case C</b>
<b>Written material</b>	yes	yes	yes
<b>Interviews</b>			
Preliminary interviews	1	1	2
Supplementary interviews	3	10	7
<b>Validating workshop</b>	1	1	1
<b>Review commenting</b>			
Via phone	yes	yes	
Via email		yes	yes

After the single case studies, a cross-case analysis was conducted (phase 5 in Figure 1). The different practices and process mechanisms were compared in phase 5 and later in the final phase presented and discussed with the management of the process owner organisation.

## RESULTS

Based on the analysis of the three case processes, three development areas were identified: (1) separation of requirements from solutions, (2) standardisation of information inputs to reduce making-do, and (3) standardisation of operations and their order. Next, each development area is presented in more detail.

### SEPARATION OF REQUIREMENTS FROM SOLUTIONS

In this study, a *requirement* is defined after Pennanen (2004): a requirement refers to a need that the customer selects and commits among all the other needs. The customer typically has a lot of needs but all needs cannot be fulfilled. Therefore, the customer has to select a need to which to commit. There are several solutions to realize a particular requirement (Pennanen 2004). For example, if it is required that an employee can do concentration-intensive work, there are many solutions to realize this requirement: concentration-intensive work can be done in an own room, in a study booth, in a library, at home, or in a café to name a few.

In the case processes, differences were found relating to how precisely the requirements were separated from the solution. In the well flowing process (case A), a study called strategic workplace planning was conducted early in the process: before alternative properties were searched for and before layout planning discussion was kicked off. The workplace study worked as a strategic planning tool where the customer organization together with workplace consultants identified their workplace needs. In the other two cases, the workplace study was also conducted but it had a different role. In case process B, a similar study was conducted but in a different phase: it was conducted at the time when alternative properties were searched for and discussed. In case process C, a similar study was also conducted, but the customer organization was not involved in the study: it was driven by the central administration of the customer organization. Therefore, the client organization had already selected the future property and the layout planning had already been started before the strategic workplace concept could be acknowledged in the service process.

To summarise, in case A the process first included requirement identification and after this the most suitable solution to realise those requirements was discussed. In cases B and C, the discussion soon focused on solutions and when the stated requirements in the workplace study were brought into the discussion, it was challenging to change the already designed solutions to match with the identified requirements. In addition, in cases B and C the customer in general perceived the already decided solution as a requirement (e.g. own rooms were seen as a requirement). This created extra turbulence in the process and had a decreasing impact on customer satisfaction because the customer had a feeling that their requirements were not taken into account.

### **STANDARDISATION OF INFORMATION INPUTS TO REDUCE MAKING-DO**

Making-do was identified to interrupt the case processes, to decrease the effectiveness of the processes and to increase lead times. According to Koskela (2004), making-do refers to a situation where processing is started with incomplete information. Table 2 summarises the making-do in the cases through typical outcomes of the different phases of the service process: alternative properties, property selection, program, layout planning, and lease agreement.

First, alternative properties are typically searched for the customer organisation in the service process. In cases A and C this was done once but in case B this was actually done several times (row 1 in Table 2). In case B, the alternative properties were searched for more than once because the customer organisation was changing and thus the previous searches were made with incomplete information. Second, the property selection was conducted more than once in case B because of the incomplete information (row 2 in Table 2).

Third, in the well flowing process (case A) the program was conducted at the beginning of the service process and used later in the process (row 3 in Table 2). In case B, the actual programming was conducted in a different form and thus the outcome did not include an actual program but a stack of different reports and memos. In case C, the program was also conducted at the beginning of the service process but it was done with incomplete information and thus the program became outdated. The program was not updated but the architect was informed that there was out-dated information in the program.

Fourth, some of the layout planning also turned out to be making-do in the less well flowing processes. In case B, the first layout plans ended up as making-do because the target properties were changing and the information was incomplete. In the case C, the property stayed the same but layout planning was conducted twice: after the strategic workplace management service was conducted the already made layout plans turned out to be making-do and new layout planning was conducted with complete information.

Finally, in all cases the lease agreements were made with incomplete information. However, the extent of rework differed. In case A, some terms of the lease agreement were specified but new negotiations were not needed, unlike in case B. In case B, lease agreement negotiations were conducted more than once because the already agreed lease agreement became invalid. In the case C, the lease agreement was conducted once but the negotiations were extended because the new layout plan had an impact on the investment calculations.

Table 2: Making-do illustration the case processes.

	<b>Outcomes in the process</b>	<b>Case A</b>	<b>Case B</b>	<b>Case C</b>
1	<b>Alternative properties</b>	Was done once.	Was done several times.	Was done once.
2	<b>Property selection</b>	Was done once.	Was done several times.	Was done once.
3	<b>Program</b>	The program was done once.	No program.	The program became out-dated.
4	<b>Layout planning</b>	Was done once in the selected property.	Was done for several properties.	Was done twice to the selected property.
5	<b>Lease agreement</b>	Checking was conducted after the property was renovated.	Negotiated and done several times.	The lease agreement negotiations were extended.

To summarise, in the case processes incomplete information did not impact only on the next phase but on several following phases. Therefore, the effect of making-do that seems trivial beforehand is multiplied as the process goes on.

#### **TO STANDARDISE OPERATIONS AND THEIR ORDER**

Based on the empirical evidence, synchronisation of the service operations had a crucial role in the cases. In case A, the synchronisation enabled a flow and in cases B and C the failure in the synchronisation resulted as making-do and other waste. Next, the synchronisation in each case is presented.

In the well-flowing case, the requirement identification synchronised the service process. Before property selection, the requirements of the customer organisation were identified with strategic workplace planning. The requirements set by the ministry(/ies) were used as a constraint in the service process. After this, it was possible to compare the requirements to property alternatives because it was ensured that required information was completed. After the property was selected, the solution was derived from the identified requirements.

In the other two cases the synchronisation did not succeed as well as in case A. In case B, the lease agreement negotiations were used to synchronise the service process: information that was needed in the lease agreement negotiations was claimed from other process phases. However, the received information was incomplete and, thus, a great part of the entire process turned out to be waste, namely making-do. At one point, the process was set on hold for months because required information was not available. However, the process was activated although the information, which had been waiting, was not available. The process was activated, because it was thought that it is more efficient to start working although the information was not complete.

In case C, programming was used to synchronise the service process: information to estimate how the selected property should be renovated to match the requirements of the customer organisation was claimed from other process parts. Also in this case,

a conscious break was taken to wait for information from the central administration of the customer. However, also in this case, the process was activated although the required information was not available. This was done because of time pressure and because it was thought that the process can be activated with certain presumptions.

To sum up, operations and their order is not standardised in the cases. There is an aim to synchronise the operations but the success is not always guaranteed. Based on the empirical evidence, it seems that the completeness of information has a crucial role in the success or failure. It is typically accepted that information is incomplete. When the information is incomplete, the available information and the possible risk of incomplete information determine what will be done, to what extent and in which order.

### **DISCUSSION - THE KEY AREAS OF FUTURE DEVELOPMENT**

Based on the results presented above, the key areas of future development can be summarised by three points. First, standard order in which the operations take place to make a clear distinction between requirements and needs should be developed. Second, standard information inputs should be qualified, which would reduce making-do. Third, if the standard information inputs are followed, synchronisation of operations and their order should lead to a better flow. Shingo (1989) calls this standard task combination. Of course, the standard information inputs and standard operations and their order should be developed simultaneously to synchronise the facility management service processes.

To summarise, at least three aspects require standardisation: the information inputs, operations, and the order of operations. Takeda's (2011) definition of standard work procedures is fairly close to the conclusions presented here. In the definition, standard work procedure means that every work procedure has *clear and precise work guidelines, which consist of three work components: (1) orderliness, (2) standard resources (3) and takt time*. Next, the three work components are discussed.

First, orderliness refers to work order that is followed while the work progresses (Takeda 2011). In this paper, the same issue is discussed under operations and their order in order to synchronise the service production. In lean literature, orderliness is typically referred to a Japanese term *seiton*: the second S in 5S or 6S. *Seito* means arranging items by their use in order to minimize the searching and other waste (e.g., Imai 1997, Takeda 2011). This means that items should be accessible and comprehensible for everyone (Takeda 2011). Unfortunately, the cases indicate that this is not always the case, i.e., making-do is generated because work is started with incomplete information. This leads to the third work component, standard resources.

According to Takeda (2011) standard resources refers to "*the minimum quantity of resources necessary for a work process*". In this paper, this issue is discussed under the standard information inputs. According to Shingo (1989), the standardisation of operations should cover three components: setup change operation, principal operations, and margin allowances. In the case studies, the setup operations refer to information that need to exist and be prepared before the principal operations (i.e., actual production). In the case studies, this kind of classification is not yet clear enough.

The third work component is takt time. In the literature, takt time is typically referred to a time that is needed to produce an item. However, takt time is not solely a given time period that should not be exceeded. Takt time also requires resource



planning: what is the minimum number of employees, machinery and information that the planned takt time requires (e.g., Shingo 1989, Takeda 2011). In facility management, too often takt time is understood as a given time that employees need to beat without ensuring that reaching this time is possible. Takt times were also measured in the case studies: in the well flowing process (case A) the takt time was 2,5 years and in the other cases (B and C) 3,5 years. In the analysis, it was acknowledged that takt times were relatively long. However, the long takt times were seen to indicate that the service processes have waste that is generated because of lack of standard information inputs and lack of standard operations and their order.

## **CONCLUSIONS**

In this paper, the aim was to analyse the FM service process under standardization from lean management perspective to identify key areas of future development. The selected facility management service process was studied through three cases. Each case study followed same research process. The case process visualisations were based on written and oral material and each case process was validated in a workshop. After all three case studies were conducted, conclusions were made on the key areas of future development of the FM service process.

Analysis identified three areas of future development. First, standardisation should be developed in the separation of requirements and solutions and their order. If a solution becomes a requirement, the process will most likely be disturbed. For example, to match the solution of own rooms to an open plan office is more difficult than to find a solution that matches the requirements of increased feeling of privacy and co-operation. Second, standard information inputs should be qualified in order to avoid making-do. In the case service processes, the actions were often based on incomplete information that created making-do. For some reason, to continue working based on the incomplete information is seen as acceptable or even as a sign of good work although it created a great deal of making-do in the service process.

Finally, if the standard information inputs are followed, the synchronisation of operations and their order should lead to a better flow. Therefore, based on this research it can be argued that at least three aspects require standardisation: the information inputs, operations, and the order of operations. Further development in standardisation is required in order to synchronise the FM service process and to be one major step closer to one-piece flow.

In general, the standardisation in the field of FM requires more research. In the future, it would be useful to study more flowing service processes in order to establish operation standards together with employees. Also a great challenge is to get the employees to follow the standards. This certainly requires research investments in the future.

## REFERENCES

- Edwards, V. and Ellison, L. (2004) "Corporate Property Management – Aligning real estate with business strategy", Blackwell Publishing, Oxford, UK.
- Imai (1997) "Gemba Kaizen – A commonsense, Low-Cost Approach to Management", McGraw-Hill, New York, NY, 354 pp.
- Jensen, P., van der Voordt, T., Coenen, C., von Felten, D., Lindholm, A.-L., Nielsen, S., Riratanaphong, C. and Pfenninger, M. (2012) "In Search for the Added Value of FM: What We Know and What We Need to Learn", *Facilities*, 30 (5/6), 199-217.
- Koskela, L. (2000) "An Exploration Towards a Production Theory and its Application to Construction", Dr. Tech. thesis, Technical Research Centre of Finland, Espoo.
- Koskela, L. (2004) "Making-do – The Eighth Category of Waste", in the proceedings of *12<sup>th</sup> annual conference of the International Group for Lean Construction*, Elsinore, Denmark (available at [http://usir.salford.ac.uk/9386/1/2004\\_Making\\_do\\_the\\_eighth\\_category\\_of\\_waste.pdf](http://usir.salford.ac.uk/9386/1/2004_Making_do_the_eighth_category_of_waste.pdf)).
- Lindholm, A.-L. (2008) "Identifying and Measuring the Success of Corporate Real Estate Management", PhD thesis, Helsinki University of Technology, Espoo.
- Morgan, J. and Liker, L. (2011) "The Toyota Product Development System: Integrating People, Process and technology, productivity Press, New York, NY.
- Pennanen, A. (2004) "Workplace Planning - User activity Based Workspace Definition as an Instrument for Workplace Management in Multi-User Organizations", Dr. Tech. thesis, Department of Architecture, Tampere University of Technology.
- Shingo, S. (1989) "A Study of the Toyota Production System From an Industrial Engineering Viewpoint", revised edition, Productivity Press, Cambridge, MA.
- Takeda, H. (2011) "The Synchronised Production System – Going Beyond Just-in-Time Through Kaizen", reprinted, Kogan Page Limited, Ann Arbor, MI.