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An analysis of the uses and properties of the Obeya

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Abstract

The term Obeya has become known as part of the Toyota Product Development System and the Lean Product Development strategy which has come out of that. Literature describes the Obeya as one of the tools of the TPDS, but rarely discusses what really makes an Obeya work, and what the critical aspects of it are.

In the EU-sponsored project LinkedDesign, which develops methods for design in distributed work groups – often called collaborative design – a virtual Obeya has been identified as one of the subgoals. In order to specify such a solution, we need to examine thoroughly what Obeya is, how it is used, and what the critical factors determining its success are. This paper provides such an analysis.

Keywords

Lean product development, Obeya, collaborative design

1 Introduction

1.1 The Obeya term

Obeya is a term used for a ”large room” connected to project work in industry. Its origin is in the G21 project at Toyota in the 1990s, a project which led up to the first generation Prius [Morgan, Liker 2006]. At the onset of this project, Takeshi Uchiyamada was appointed Chief Engineer for the project. He felt that he lacked the necessary authority to make the optimal decisions, and thought he could be overrun by experienced discipline leaders in a way that was not optimal for the project as such. He therefore needed the support of the other discipline leaders whenever he had a decisive discussion with one of them [Liker 2003].

In order to achieve this, he instituted the “large room” – Obeya in Japanese – as an arena for all his discussions with the discipline leaders. In this room, the other discipline leaders would be present, and documents and data would be available to all.

As the project progressed, the results were so good that the idea was taken up by the Toyota organization, instituted at its new Thailand premises for the IMV project, cf. Figure 1, and after a while made a standard part of the Toyota Product Development System [Osono et al 2008]. By then, a number of standards for the Obeya had been found. The documentation, for instance would be on A3 sheets on the wall, each sheet representing a problem, decision, idea or – more precisely – all necessary information, across disciplines. The A3 format represents a simplified and condensed format for information communication. Thereby, all information would be brief and concise, and all present in the room would have easy access to the necessary insight in the cases.

So the original Obeya was a room for project management.

However, as time progressed and experience was gained, the room started to be used for more than management. Typically, technical discussions between disciplines would take place in the

Obeya, and this meant that more information would have to be present. It therefore became custom to post all important information in the room.

1.2 Objectives behind Obeya

What should the Obeya achieve? A levelling of management influence is obvious, but by today's standards, by no means enough.

As with all methods and techniques for product development, the two overall objectives are:

- Efficiency of the development process, and
- Quality of the resulting product (quality as in "having the right properties" [Mørup 1993])

In the case of Obeya, both objectives are considered crucial. In this paper, we will focus on the first point and look into what efficiency in development is, and how the Obeya can contribute to it. Among a number of factors promoting efficiency, the following are important:

Figure 1: The Obeya of the IMV project at Toyota Thailand *(from [Osono et al 2008])*

1.2.1 Rapid decision-making

In a setting where all relevant people have access to the same information in a condensed format and accessible to all, decisions are more easily made, and therefore take less time.

1.2.2 Reduction in rework and reconsiderations

This is where the potential for time saving is most obvious. Rework, in the form of iterations, is an important part of all development work. This is natural and should be so, but must be kept at as low a scale as possible. Hitting a dead end or an insurmountable obstacle often sets the project back weeks and months. The costs of this can be considerable, but even more severe is the risk of missing the product delivery date. It can possibly mean a missed launch window, and this can have serious economic consequences, and even if it doesn't, a delayed introduction will mean lost sales.

1.2.3 Reduction in unnecessary discussions

In development work, creativity, idea generation and discussions are core activities, and therefore crucial. So discussions are a good thing. What isn't, is discussions over and over about things that have already been clarified or decided. That is pure waste of time and brainpower. And the Obeya is a way to reduce such waste. When everybody have access to the same information at the same time, and important discussions take place with participation of all relevant people, then the discussions will tend to be done with and dealt with at the right time, and not repeated with new people over and over again. It is believed that this also leads to better decisions as a result of the broad involvement.

1.3 Requirements

In order to prepare for the development of a virtual Obeya, we need to find out what requirements must be placed on an Obeya for it to work according to the objectives. This analysis has not been done yet, but will take place after the analysis of the Obeya is finished.

2 Research approach

This is an introductory phase of a project leading up to a novel concept, the virtual Obeya. In this introductory study, the main research approach is literature study.

3 Different rooms and perspectives of an Obeya

Figure 2: Different rooms related to the Obeya

In order to understand the Obeya and what makes it work, we have examined other types of such big rooms, and will go through them. Our understanding of the Obeya is that it represents a combination of many of these rooms, that is it includes the functionality of many (if not all) of them. We can therefore regard these rooms as aspects of the Obeya, although they originated as separate concepts. Figure 3.1 shows a collage of different types of cooperation rooms relevant to the Obeya, which shows different functionality and different properties.

Virtual - Modern technology allows us to actively participate in the activities in each of the rooms without being physical present. That means that activity, including active real time view, is possible for participants at both the same place and/or different places at the same time. Passive view, simply observing is also obvious in all rooms.

Visual - A major focus in all these rooms and all of our work is the focus on visual perception (as part of visual communication), which means the ability to interpret information and surroundings from the effects of "visible light reaching the eye" [From Wikipedia, the free encyclopaedia]. By that we mean the use of pictures, graphs, colours, objects and what else makes it possible to grasp complex relations of many different factors in a glimpse in a blink of an eye. Even though reading is also based on visual perception, very people are able to read an entire page in a glimpse (like Raymond Babbitt, the "rain man") [From Wikipedia, the free encyclopaedia].

The use of colours, graphics, and symbols provides clear and unambiguous information that can be understood in a heartbeat. Visual management is based on visual perception, and is generally regarded as a clear, simple and effective way to organize and present work. It can also be perceived as fun, since visual elements bring colour and life into an otherwise boring office environment. Another benefit of visual management - often overlooked - is that it can positively influence the behaviour and attitude of team members, managers and stakeholders, for example, by helping build transparency and trust.

"Information Radiator" is a popular term invented by Alistair Cockburn that is used to describe any artefact that conveys project information and is publicly displayed in the workspace or surroundings [Cockburn 2006]. Information radiators like "Task Boards" or "Big Visible Charts" are very popular in the Agile world (the computer science equivalent of lean product development). But there are also less obvious items like "lava lamps" and stolen street lights as project health indicators. [Perry 2007].

Over time the term "Obeya" has been used for many different views and perspectives regarding the product development process. The following types of "Big Rooms" have been identified (cf. Figure 2):

- War Room
- Work Room
- Meeting Room
- Discovery Room
- Sharing Room
- Workflow Room
- Management Room

Those "Rooms" have different purposes and can be specified along different perspectives. In Figure 2 and in the following chapters each room is described by using 5 perspectives:

- Action and duration of action perspective - when and how long action takes place
- Recordings perspective - how long recordings for passive viewing are taken
- Problem and task perspective - in which way tasks and problems are treated

- Participation of functions and people perspective - which functions and how many people are present
- Information / data perspective - how much information is available

3.1 War Room

The war room is the most extreme variant of an Obeya. A good description of it is given in [Mark 2002]. In a war room "all" important functions are "always" present and able to monitor the situation to make the necessary decisions and bring the orders out to those who can execute them. Each of the core team members (typically less than 20) in the war room is normally backed up by his team on the outside for support through hard work and information. In that way tasks are identified, described, assigned and worked on in real-time. Problems are identified, assigned and solved in real-time. Recordings are always taken.

3.2 Work room

Toyota has found that one of the best ways to create an open and flat environment is to have everyone work together in a large room with no partitions. Individuals representing the different functional groups on the production preparation team such as technology, production, procurement, logistics, marketing, and accounting, were assembled into one large room to foster open communication and teamwork. That is probably the most common room related to the Obeya. In this room the work gets done. Tasks are identified, described and worked on. Problems are identified and solved. Action takes place both at the same and/or different times in long durations. Recordings are only partly taken with regard to the workers' need for "privacy". The need–to-be-there functions are represented in an effective team of about 10 people or less with "all" information / data available.

3.3 Meeting room

Engineers are not co-located. It is the engineering staff leaders (leaders of each functional group) who meet with the chief engineer regularly. These engineering managers have desks in their functional organizations and come to the meeting room regularly (often daily) for collaborative work sessions (not traditional meetings).

One of the best ways to do this is to co-locate the team in an Obeya, the same way Toyota co-locates its product team leadership, and uses it as a lean product development strategy room. Sections of the walls can be assigned to each of the work stream teams for "information radiators" like value stream maps, A3s, or other relevant information across teams. In addition the room can be used as a regular meeting location and at the same time learn what the other teams are working on. Because of the interdependency of most tasks in product development, this "socialization" process among the teams is critical. The goal is to create an integrated product-development value stream—not isolated work streams that lead to optimizing local process at the expense of the greater process [Morgan & Liker 2006].

Action takes place at the same time and are always recorded. Tasks are described, assigned and worked on. Problems get identified, assigned and solved. Functions, people, information and data are present on a need-to-be-there basis.

3.4 Discovery room

A discovery room is an "experimentarium" or science centre, where technologies, techniques and solutions can be tested and toyed with [Arth 1977]. Action takes place at the same and/or different times and are partly recorded. Tasks are worked on and problems get solved. Functions and people are present on a need-to-be-there basis with "all" information and data available.

3.5 Sharing room

To enhance communication and teamwork, information about the project is posted on the walls of the sharing room, much like in "situation room", a process known as Mieruka (visualization) in Japanese. Information about what was going on, the issues of the project at any given time, and what the plan was next, are all up on the walls, not tucked away in someone's desk or even worse in someone's computer. In addition the sharing room will contain all the background information and data in all the different representations like data and paper files, books, charts, pictures, sound files and recordings, videos and so on and last but not least physical objects. There one can find existing products, components and models, both own and from competitors. In that way the sharing room is the largest room of them all because it contains all the information, data and knowledge providing the basis for new product development.

The action – sharing – including both giving and receiving is going on at the same and/or different times, usually in short durations. Because of the nature of the process, the information always needs to be "recorded" because it needs to last. There is no activity related to tasks and problems, you simply share all information and data with all functions and people.

3.6 Workflow room

"There is no tool or method in my repertoire that has had greater success, both from the standpoint of impact on team performance and from the perspective of ease of implementation" [Mascitelli 2011].

The workflow room is based on frequent stand-up meetings of short-duration creating a sense of urgency, facilitating positive peer pressure to be productive, enabling synchronization of work and allowing the rapid resolution of conflicts and issues. This kind of meetings is used by different kinds of organizations living in a rapidly changing environment where it is vital that team members frequently resynchronize their efforts, coordinate, communicate, and flexibly adapt to current conditions. Examples are the police, hotels, casinos and of course sport teams – in rugby it is called the "scrum".

First thing in the morning and the duration of maximum 15 minutes balances the sense of urgency and the limit of people's comfort. It gives answers about what the team has accomplished since the last meeting, what has to be done before the next meeting and what might prevent the team from doing it.

The stand-ups are supported by a task board with the mission of visually representing the work that is being done by the team, a "living" entity that has to be manually maintained.

A good task board should be carefully designed with readability and usability in mind, and the project methodology should actively rely on it. This implies that the use of the task board should be standardized and form part of the process. If task boards (and other information radiators) are not an integral part of the project methodology, maintaining them might be perceived as overhead or duplication of work. This results in boards not being updated and becoming out of sync with the work actually being done. An incomplete or stale task board is worthless. A task board is a living entity and should be kept healthy. (Quoted from [Perry 2007]) (cf. Figure 3)

Figure 3: A task board *(from [Perry 2007])*

Nobody complains about having to use it, it supports and captures the stand-ups, people passing by stop to look and understand it.

Most task boards are set up without giving too much thought to aesthetics and usability. They are hastily made, using available materials and without putting much attention to detail. There are no guidelines regarding the use of colours or materials, and no defined process for using the board. All this makes for very low readability and poor usability in general. If you are standing two meters from such a board, it looks sloppy and is rather illegible. There is no doubt that with some effort, one can do better than that! [Allue 2009].

In the workflow room action necessarily takes place at the same time with a very short duration. The task board itself is the recording item and everyone can look at it up to the next meeting – snapshots should be taken after each meeting. Here task and problems get identified and assigned. The need–to-be-there functions are represented in an effective team of about 10 people or less with just the need–to-be-there information / data available.

3.7 Management room

Figure 4: A management room meeting at Scania *(from Peter Palmér; LPPDE-NA 2011 Presentation)*

The management room, with Figure 4 as a typical example, is for information purpose only. The sheer size of the board and the number of coloured magnets combined with the number and dress code of the meeting participants strongly indicate that here no tasks or problems are worked on or solved. One can get an overview of the state of the entire project in general with problems and delays pin-pointed. It is an attempt to break down walls between departments, and upper and lower management in big projects where un-involvement and potential breakdown in communication can cause major problems. The purpose is to ensure that everyone, and especially the leadership team, can get a snapshot of the performance by global metrics, specific Key Performance Indicators (KPI's) and project timing – the core information / data for that purpose. Action happens at the same time but gets recorded for viewing, both real time and later. The duration is normally very short, no work is done but problems get pin pointed to all functions and people.

4 Aspects of a Virtual Obeya

In previous work with implementing Obeyas in design and development departments of industrial companies, the authors have recognized certain particular aspects that are crucial to achieve the positive effects of an Obeya. As such industry internal improvements are usually regarded as sensitive information by the companies, we have not published these observations, and we have not found much published by others either. But some of the paramount aspects are discussed in the Toyota literature, for instance [Morgan & Liker 2006].

4.1 Visual

The importance of the visual aspect is as strong in the virtual Obeya as in the physical Obeya and that is valid for all the different rooms. The visual aspect has been discussed in the previous chapter.

4.2 Physical

Product development is still a human activity that depends also on the physical interaction of the team members with each other. So it is necessary to carry over the physical aspects of the Obeya into the virtual world. One should only use virtual solutions when logistics or other issues cannot be resolved in any other way. Even then, the basis should be a physical Obeya used by a physical co-located sub-team.

4.3 Virtual

An early discussion on virtualization of Obeya-like rooms is given by Kirsh [Kirsh 1998].

The reality of most project teams is that developers may be spread out over several time zones, and may also include outside contractors and key suppliers. Today many different tools can be used to achieve different benefits of a physical Obeya also in the virtual world. Customized virtual tools such as “Visio” look much like a physical wall-Gantt. A set of drag-and-drop stencils are available for use by the team during their virtual stand-up meetings. Real-time interaction is possible through on-line webcast applications. In this way, each team member can interact and make their modifications (i.e., move, add, or remove sticky notes) in real time.

Other tools like “GoToMeeting” can help to facilitate a virtual stand-up meeting in a similar way as a collocated one [GoToMeeting 2012]. Once the meeting is over, it is possible to print out a physical copy of the board to post on the wall at all involved locations, or simply provide big screens for the same purpose.

Although some virtual approaches come close to physical implementations, there is no substitute for the personal interaction of team members. Cyberspace doesn’t change human nature. Gathering a project team several times per week for face-to-face discussion and planning has benefits at many levels, not the least of which is the building of team identity and emotional commitment. As hard to define as they may be, a great team leader recognizes these intangibles, and makes the most of them whenever possible. A virtual project board may be easy, but having team members see each other face-to-face is the most powerful “visual” management tool there is. [Mascitelli 2011]

5 Realization of a Virtual Obeya

The most crucial part in the realization of a virtual Obeya is the combination of the aspects of visual, physical and virtual. There are few places where those aspects are discussed in combination with each other. One of them is the "Physual Designing™ conceptual framework" that integrates physical arenas and virtual tools in a visual collaborative environment capable of supporting collocated teams and individual contributors engaged in tight synchronous collaboration. That framework is compatible with a wide range of available collaborative technologies and is used to develop recommendations that are based on a fundamental understanding of key dimensions that, when orchestrated, can contribute to improved collaborative effectiveness and competitiveness. [Kristensen 2003].

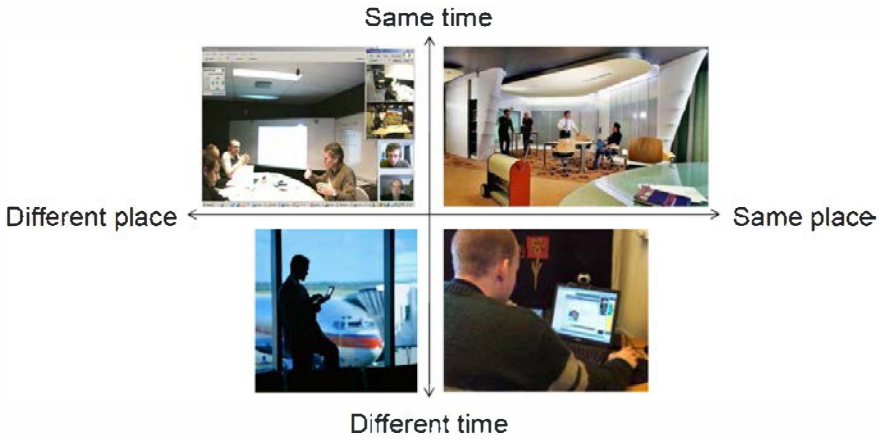

Figure 5: The aspects of physual, as defined by Kristensen [Kristensen et al 2004], [Kristensen 2008] *(photos from [Kristensen 2008])*

Physual is a term that refers to a combination of physical, virtual and visual. Physual designing supports collaborative effectiveness and efficiency in teams through a combination of a physical arena, a virtual workspace and selected computer peripherals. The physual designing network is a portal that enables shared access to all resources necessary to engage in collaboration in any team, any time, from any place. The term physual has been coined by Kjetil Kristensen [Kristensen et al 2004] to describe the virtual/physical continuum as shown in Figure 5.

A virtual Obeya needs to take those kinds of frameworks into consideration but is expected to reach longer, but how far and in which direction? They only thing we know is that we need it. Major findings in a survey among 43 oil and gas companies regarding collaborative work environments (CEs) are as following [Kristensen 2008]:

- CEs are mission critical.
- Audio and video conferencing and data sharing are the most important functionalities today, but many respondents find the applications difficult to use.
- Current and anticipated use is higher than expected. More than 75% of users expect to see more CEs in their corporations, and in excess of 30% work in CEs more than 6 hours per week.
- Integrated operations and related concepts are reaching a stage of maturity.
- The major challenges often lie within the organizational structures.
- Multi-purpose CEs are increasingly becoming popular.

- The failure rate of CEs is still too high.

6 Conclusions

The Obeya is a much more diffuse but also complex tool than first anticipated. The many different uses of the term and subsequently the different perspectives and functionalities connected to the diverse rooms are all important. When it comes to describing and specifying the virtual Obeya concept, which is the ultimate goal of this part of the LinkedDesign project, it is important to acknowledge the various functions, so that the virtual Obeya will fundamentally have at least the same functions as a "traditional" obeya. Without this, we risk a concept which is only superficially similar, but which will lack important properties and thus will not have the same positive effects on development projects. The virtual Obeya's added computer equipment and networks introduce considerable extra complexity, and to compensate for this the benefits of the virtual Obeya needs to be large if the gains in efficiency shall not be outweighed by the extra work, problems and irritation from equipment and networks.

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