CHARACTERISTICS TO BE BROUGHT FROM EARLY DESIGN AND CONSTRUCTION TO CREATE VALUE FOR USER AND OWNER OF BUILDINGS IN THE LONG USER PHASE

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ABSTRACT

The objective of the paper is to present parts of the findings from research project "Oscar – Value for User and Owner of Buildings". The main intention of Oscar is to develop competences, methods and analysis tools for optimizing building design to contribute to value creation for owner and end-user throughout lifetime. This paper presents Oscar project's findings regarding how users of Hospitals, Offices and University buildings perceive value and which design elements can contribute to higher value creation for users.

The methodology is based on both qualitative and quantitative research methods. Different approaches such as literature review, case studies, questionnaire interviews, survey and workshops has been applied for collecting data through several work groups, master – and bachelor thesis.

The research has its focused on three main types of building; Hospitals, Offices and University buildings.

The results reveal that although value is known to be a personal perception, there are certain functional and emotional elements and design criteria that can be decisive in whether users are satisfied with the buildings or not. The research also shows the potential for improvements in different processes during the project like user involvement, regulations and decision-making.

The results of the studies will contribute to better understanding of user value and what should be taken into consideration in design phase in order to increase value creation in projects.

The research is important to increase the understanding of value creation for owner's and user's perspective and consideration in early design phase

KEYWORDS: value creation, competence, lifetime, early design phase

INTRODUCTION

There is well known that there is coherence between how we design and how we operate, maintain and enhance our buildings and what values the building (space and infrastructure) create for those using, managing and owning the space. The design also influence people and organisations effectiveness in executing their work, the core business efficiency.

Research about value shows it is subjective based on individual and cultural background. But value in a project depends on the stakeholders involved. According to Eikeland (2001), stakeholder can be a person, group of persons or a business. All of them acts in a project. They get roles, different tasks etc, and they are bearer of own interests, values, competence and resources which they bring into the project they are going to create. All this will influence on the value creation throughout design and construction period, which is a short part of project total lifetime. In the long part of lifetime, the users are stuck to the result of the project.

Value for the owner of the project, the client, will be a part of the strategy and must be communicated to the stakeholders. Hjelmbrekke et al. (2015) concludes that many projects become a motherless child due to three perspectives; i) client does not manage to translate his strategy into tangible project requirements, ii) project team are torn between loyalties throughout project period and iii) user requirements rarely comes to prevail.

Value for users are connected with better living condition such as sustainability, adaptability, reliability, perceived value for benefits (Sarasoja and Aaltonen, 2012, Valen et al, 2014). Norwegian white paper Stm 28:2012 points out the sustainability element in properties and states that ‘sustainable properties create the best usability for the core business over time and meet the demands of the owners, property managers and society’.

The concept and function of "Value Management" (Shen, 2013) is important to coordinate various stakeholders values. Clients value /strategy should be in function with "Property Management" including "Value Management" from the early analysing, designing and construction phase in a value creation process to obtain the required value. International trends also show that increasing the clarification between the distinctions ‘Architectural and Engineering Early Phase Plan’ and ‘Architectural and Engineering Detailing Design’ can strengthen the integrated approach in the early stages as the basis to deepen the project's value over time.

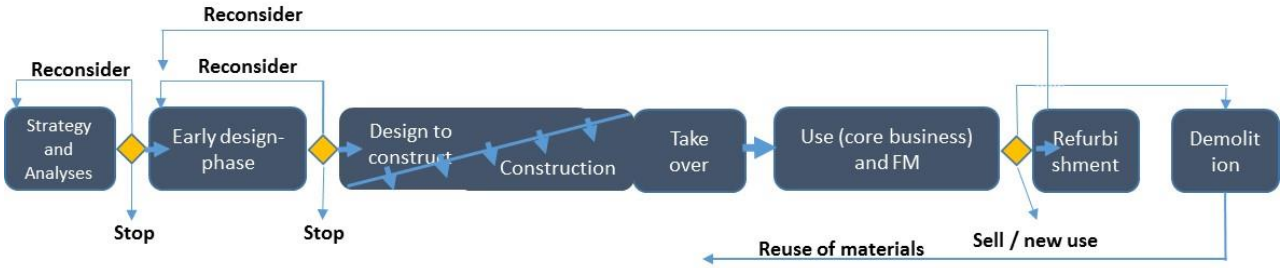
APPROACH

The research project “OSCAR – Value for User and Owner of Buildings” with the main intention ‘to develop competences, methods and analysis tools for optimizing building design in a way to contribute to value creation for owner and end-user throughout its life time’ started in 2014. The intention is, in addition to reports from work packages, and guideline on how to create value and a wordbook to avoid misunderstanding different words definition/content.

The project takes into consideration a clear connection between the design and operation of the buildings and values for the owners and users. To achieve value creation processes, it is necessary to have competent actors who have good tools for decision and communication through projects and processes. Life Cycle Aspect is

essential as an input in Early Design Phase, and the processes through the following phases have to assure its inclusion in a way that value creation is complied with the user phase.

The research findings in Oscar project are a result of cooperation with 17 project partners from three countries from academic, private and public sector, representing all stakeholder groups. It is presented how it is possible to achieve more efficient buildings by collaboration of stakeholders from the early beginning with the same goal to maximize value for owner and user over building's life time. Oscar lifetime phase plan, including refurbishment and demolition is shown, also decision gates, in figure 1. In accordance with findings from literature review and



purpose of the project, the relevant stakeholder groups for Oscar project are: owners, users, planners/designers, consultants, FM providers and contractors, FM providers and society.

Figure 1: Oscar phase plan throughout lifetime

Oscar project contains three working packages (figure 2) and four phases, with a goal to; i) to define the knowledge how to contribute to value in user phase as input in Early Design Phase (focus on characteristics which contribute on value creation), ii) to define execution models and processes which execute contribution to value creation, and ii) to design methods and tools (focus on cost benefit evaluation simulation model and information to user phase so value can be obtained).

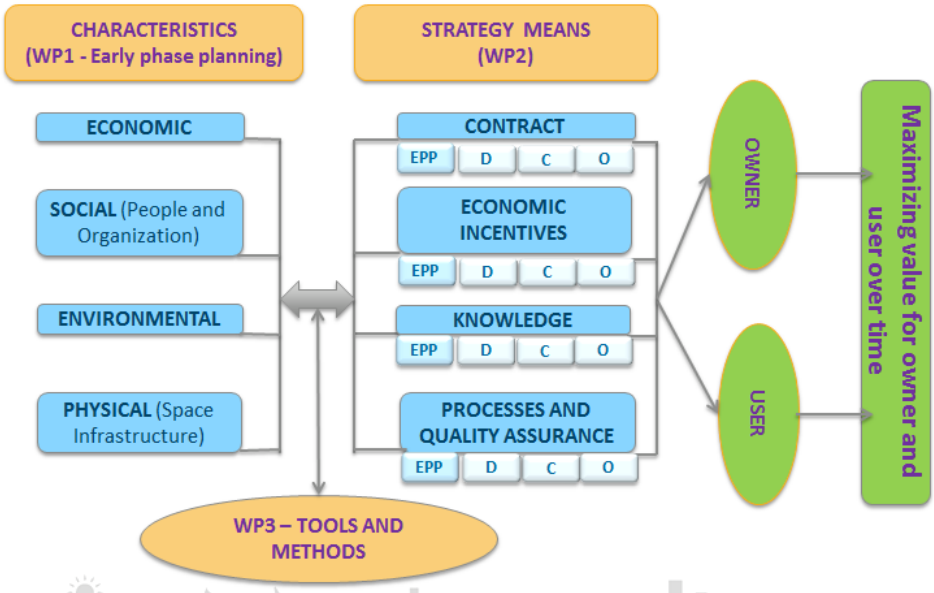


Figure 2. Value contribution model

From literature review about value aspect, it was concluded to use OSCAR definitions as:

- Value: the project value should be a result of owner's strategy for the project.
- Value creation: process needed to achieve value.
- Added value: innovation and possibilities throughout the project process which can increase value outcome.

Within the first phase of the project, a list of characteristics and means are found from literature review, which are important for the value creation. (figure 3 and 4).

Figure 3. Characteristics for value creation

Project group	Subgroups	Characteristics or Means
WP 1 – Characteristics which contribute to value creation	Economic	Optimum FM organization, maintenance plan (predictability), outsourcing, transparency of costs, cost of ownership, running/operational cost, cleaning cost, space efficiency cost, rental cost, interaction of costs (best solutions not lowest costs), project cost, cost reduction, green accounting, potential income, strong brand, market value, payback time, profitability for the core business, productivity in construction phase, long term commitment partnership
	Social (People and organization)	Architectural value, satisfaction, indoor climate, comfort, individual control of conditions, aesthetic value, open view, layout (open /cell space), enough space, orientation, cleanliness, logistic service support, organizational value, social responsibility, location characteristics, historic value, usability (efficient workplace), accessibility, safety, security,
	Environmental	Renewable energy, energy efficiency, recycling and reuse of materials, waste management, minimize contamination, environmental friendly products, life time materials, green roofs
	Physical (Space and Infrastructure)	Technical condition, space distribution / logistic for core business, quality materials, construction quality, architectural solutions, life cycle design, environmental solutions, flexibility possibilities, elasticity possibilities, generality possibilities, designed for disabled persons, sufficient infrastructure, innovative solutions

Table 2. Means for value creation

Project group	Subgroups	Characteristics or Means
WP 2 – Means which motivate to value creation solutions	Economic incentives	Environmental funds, financial support for testing new trends, branding, rewarding, cost productivity, orientation, investment loan for enhancement/replacement, changing energy consumption, combining different energy resources, emission reduction, support for maintenance and technical upgrading, support for refurbishment, tax reduction, competitiveness
	Knowledge	Good planner, good management, changing regulations, new demands from society, social awareness, user satisfaction, communication ability, creating value with society, organizational development, best practice design, developing know-how training of employees, implementing new cooperation models, developing strategic KPI, knowledge on sustainable efficient building, open for new technical solutions supporting innovative ideas, establishing creative teams
	Contract	Contract process with dialogue, contract division, contract type, contract procedure, selection and award criteria, contracting plan, PPP practice, clear tasks and definitions, contract duration, financial capacity of contractor, allocation of responsibility and

		risks, clear specification of deliverables, performance targets, measurement methods and standards, active partnership dialogue, organizational measures, developing strategic SLA,
	Processes and assurance quality	Process management ability, communicating value, political support, user's participation, performance requirements for each phase, mechanisms and procedures for ex-ante evaluations, mechanisms for ex-post evaluations, monitoring, inspecting, evaluating, success / failure factors, key performance indicators

Based on the findings from the literature review, the questionnaire was prepared. Approximatewly 3000 respondents from all stakeholder groups (owners, users, planners/designers, consultants and contractors, FM providers and society) from Norway gave their opinion of importance regarding value creation for owner and user. Out of this, users represented approximately for 2700.

FINDINGS

For the early design phase, it is found among designers and contractors that 'competences' should have an important role. It is assessed that some improvements are needed, from the perspective of: 'experience', 'higher responsibility', 'clarification of project organization', 'increasing of multidisciplinary understanding', 'better project manager's competence', 'including FM experiences in early phase', 'better competence of LCC', 'more focuses on value for client/ owner/ user'.

From Kelly et al. (2014a) it is mention seven steps to achieve value: i) defining wishes from user and owner (owners strategy), ii) quantifying demands if possible, iii) workshop for possible concepts, iv) analyses, cost estimates for each concept, realism, and acceptation, v) decide execution plan, vi) process the execution plan and vii) termination with feedback.

Since value is a subjective concept depending on user group, it is some common findings such as high quality in indoor climate and –comfort. Most people take this for granted, but when it is not case dissatisfaction will appear, Bakken, I. et al. (2016).

Core business directors want adaptable buildings to reach the strategic goals for their organization. Employees in universities and universities for applied science want functionality that support their daily working processes, good technical solutions and enough of special rooms. Students asks for the same but also reading – and group rooms and social offers, Spiten, T. (2016). People from FM providers ask for easy operational technical solutions, accessibility to operations and maintenance. Local communities want a more open physical structure to obtain access for cooperation.

Open office space fit in where core business works more in teams and sharing knowledge than individually and concentrated work. Designing the workplace is a strategic instrument for the core business because facilitating work tasks will increase productivity. In both cases meeting rooms are valuable for teambuilding and socializing. Since work tasks will change faster and faster over time adaptability is important and have to be an issue in early design phase.

User involvement will give benefit to the project. Challenge in this involvement is to differ between needs and wishes. Representative must be appointed based on knowledge, time and interest, not based on position in the organization. It is also of high importance that that some stakeholders follow the project throughout planning,

design and construction phases to secure the value creation. POE (post occupancy evaluations) is important for experience transformation to next project.

Execution model consists of three sub models; i) tendering model, ii) enterprise model and iii) contract model. Combination of these three is very important regarding user involvement. Good design description is not a guarantee to safeguard value for owner and user. Partnership models (PPP) facilitate good dialog and communication in a better way than traditional models, Urdal, V. U. and Aarseth, O. A. (2015). PPP models have focus on life cycle cost (LCC), more innovation, defined share of risk, higher standard in contract period, better services (FM) for users and shorter time of execution. But PPP demands for better competence regarding dialog for contract, higher transaction cost for provider group. In school sector it is found that PPP contracts contributes to better indoor climate, maintenance on agreed standard which again bring learning environment and working conditions to a higher standard, Munthe-Kaas, E. S. (2016).

CONCLUSIONS

From literature review, it was found that there are many definitions on value, value creation and added value. Because of this, it is concluded to use OSCAR definitions as:

- Value: the project value should be a result of owner's strategy for the project.
- Value creation: process needed to achieve value.
- Added value: innovation and possibilities throughout the project process which can increase value outcome.

From Oscar research questionnaire it is seen that early design phase team should have stronger participation and competences from facility management and core business area (user involvement), in addition to integrated architecture and technology, that user's needs and value creation perspective is secured. The defined value for the project must not suffer because of other stakeholder's value concept.

Due to constantly new health treatment methods, new medical equipment and new ways of organizing health services, logistic, functionality and effective FM services are main issues to get a valuable hospital, Hareide, P. J. (2015). To obtain this there are three strategies; adaptability, life cycle economy and – planning and early involvement of FM services. For adaptability purposes, Interstitial Space has shown to positive in spite of small increase in investment costs but less operating end enhancement costs, Digernes, D., S. (2015).

From the questionnaire on project experiences, it is found within sustainability aspects that highest focus from economic perspective is on investment cost and the lowest on cost effective services. From environmental aspects, the highest focus is on indoor climate and comfort and the lowest on recycling materials. From the social aspects, the highest focus is on user participation and the lowest on facilities for physical activities. From the physical perspective, the highest were assessed accessibility and universal design, and lowest generality. From psychological perspective we can define that more desirable environment is, the greater the identification with it will be.

PPP models with defined incentives is a guaranty to secure good results. Private finance normally increase cost but it is possible for public part to finance to lower the cost. The model demand for market competence and capacity.

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