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A Conceptual Framework to Enhance Value Creation in Construction Projects

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Abstract

There is a clear link between the building design and the value creation by the businesses and users of the buildings. Measuring project success is a complex task and has traditionally been associated with criteria like time, cost and quality in the project society. However, modern project management literature has revealed that other objectives should be taken into consideration in order to achieve overall success in projects. Understanding the owner's and the users' strategic objectives and translating them into functional buildings seem to be an essential factor for understanding the true value of a project. Fulfilment of these objectives can primarily be assessed when the building is in use. Value creation of a building is therefore directly linked to the effects that owning and using the building have over its lifetime. This paper is aiming towards outlining a method to identify and understand the owner's and user's strategic objectives and use this knowledge to optimize the design of buildings in order to enhance the value creation of projects.

The suggested framework is the first step towards developing a method for enhancing value creation in construction projects. The framework is developed based on a qualitative research using literature studies and discussions with fellow scholars and experts. The research reveals that value in a life cycle perspective is created when needs are fulfilled and strategic goals are achieved. In a project perspective, the efficiency and effectiveness of suppliers is also of importance. The framework presents a method that enables the project to move the focus from the project perspective to lifetime perspective. Implementing such a method will help the decision makers to move the focus from what is best for the project to what is best for the users and the owner.

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1. Introduction

Measuring project success is a complex task and depends highly on which stakeholder is been asked. Traditionally the criteria of time, cost, and quality has been major indicators of project success in the project management society. Other factors such as profitability, technical performance, functionality, health and safety, productivity, and environmental sustainability, are also important aspects for evaluation in order to determine project success. Müller and Turner [1] suggest that measurement of success needs to focus on the following stakeholders and parameters:

- End-user satisfaction with the project's product or service
- Suppliers' satisfaction
- Project team's satisfaction
- Other stakeholders' satisfaction
- Meeting project's overall performance (functionality, budget and timing)
- Meeting user requirements
- Meeting the project's purpose
- Client satisfaction with the project results
- Reoccurring business with the client
- Meeting the respondent's self-defined success factor

Furthermore, attainments of other objectives like satisfaction, absence of conflicts, professional image, aesthetics, and educational, social, and professional aspects are also considered as indications of project success [2].

In the European research project, Value Driven Procurement in Building & Real Estate (VALPRO), lack of understanding the project owner's/users strategic objectives and lack of methodology for translating them into functional buildings is stressed [3]. The new findings from that research shows shifting the main project target from finished building toward the effect of owning and using it over its lifetime [4]. We believe that value creation of a building is directly linked to the effect of owning and using the building has over its lifetime. These effects define how successful the building has been as a product, but does not say anything about how good the project management process or the design process in the front-end has been carried out. This suggests that mapping of value creation of a building after it has been delivered might be (directly or indirectly) linked to how stakeholders perceive the project success. Considering this, we will be able to contribute to higher value creation by developing a process for gaining knowledge about what creates value after the building is delivered, and apply this knowledge into the design phase in order to optimize the design of our buildings.

The framework and methods outlined in this paper has been developed as a part of a research project that has special focus on the design process in the front end of a project – the Norwegian research project called "Oscar". Literature studies and several survey regarding value in construction projects have been conducted as a part of the Oscar project in 2015. The results from studies in Oscar project have given us valuable ideas throughout development of the model. The first version of the model has been developed based on literature study, the survey on value and discussions with fellow scholars and experts at Oscar project. The basis for the writing process of this paper has been discussions and analysis of the joint experiences of the involved individuals. This paper is therefore a product of a collective reflection of our experience and knowledge. The research is qualitative in the sense that we do not use any quantitative or statistical evidence or methods in our approach in this paper.

2. Point of departure

In order to be able to come up with a model for understanding the owner's and the users' strategic objectives and translating them into functional buildings we need some clarifications of concepts and terminologies. First, we have to be clear about what we mean by functional buildings. We also need to know how the concepts "value in project development" and "value in a project life time perspective" can be understood.

Through the literature review, we found that how users and owners perceive a building, must be seen in a broader perspective than just functioning. From users' perspective, elements like sustainability, adaptability, reliability and perceived value for benefits contribute to how satisfied they are with the building. From the owner's (or business's) perspective, the focus is on harmonizing the resources and provisions [4-11]. This leads us to the concepts of value where ensuring required functions is a contribution to value creation.

On the other hand, the owner's and users' objectives are being translated into buildings throughout a project. These objectives have to be understood and identified early in the project and be a part of success criteria of the project, which is measured after the project. Therefore, an understanding of how project success can be defined is another essential requirement.

The theoretical background in this paper is a result of acknowledging the need for understanding the concept of value, value creation, and success in projects.

3. Methodology

According to Jabareen [12], conceptual frameworks are defined as a network, or "a plane" of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena and are products of qualitative processes of theorization. Jabareen [12] provides a 7-step procedure for developing conceptual frameworks. A modified version of this procedure with five steps is going to be used in developing our conceptual framework:

1- Identifying the concepts
2- Mapping the selected data source, extensive reading and categorizing of selected data
3- Deconstructing and categorizing the concepts
4- Synthesis, resynthesize and make it all make sense
5- Validating the conceptual framework

The interlinked concepts in this paper are the concept of value and value creation together with success in projects. These concepts are identified through literature review as explained in previous chapter. In order to be able to link these concepts, a proper understanding of these concepts is required. This understanding can be acquired by literature study of the concepts. Fink [13] defines a literature review as a systematic, explicit, and reproducible design for identifying, evaluating and interpreting the existing body of recorded documents. Sources are selected by using search engines and databases for literature. References and citations in papers, articles and books have been further investigated for relevant data and information. The result of the literature study (theoretical background) is deconstructed and categorized and the concepts are linked together. Thereafter the results are synthesized and analyzed by authors and the presented conceptual framework is developed. Validation of the framework will occur by presenting it at a conference, for focus groups as well as future case studies and piloting.

Figure 1 illustrates the research design for developing the conceptual framework. The green parts show the steps that are conducted so far in the process and the blue parts are expected further research.

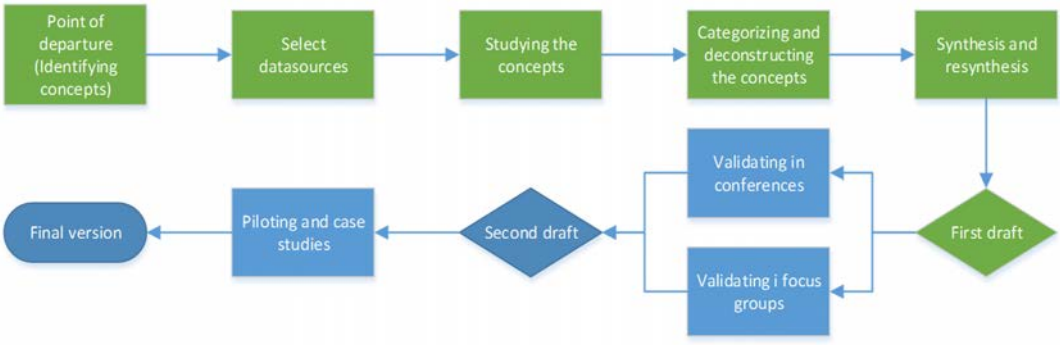

Figure 1 Research design

The first draft of our suggested model for value creation in project is presented in this paper. Our intention with this paper is to show our suggested solution and get some feedback on the ideas so that the model and the steps can be refined towards the final version.

4. Theoretical background

The discussions and pursuit towards defining value has been ongoing since Aristotle (4th century BC). Aristotle was the first documented philosopher who differentiated between two meanings; "use-value" and "exchange value"[14]. Since then Adam Smith and Henry Ford have, among others, brought the discussion further in 18th and 19th/20th century. Adam Smith focused on "productive" activities" that contribute to exchange value through the manufacturing and distribution of goods [15]. Henry Ford brought the consumer focus into the discussion by claiming that focusing on organization of industry to serve people is not in conflict with the profitableness of the industry [16]. A growing number of companies seems to have adopted the value generation models since the beginning of the 1980s by various initiatives like customer driven company, customer orientation, mass customization and value-based management [17]. Value and value management have particularly been discussed in management and marketing literature during the last decades, especially since 1980s [8, 18-25]. Although different theories and research streams have been applied in different contexts to conceptualize "value" the common ground is the focus on the customers and users [26]. As Womack and Jones [27] stress, "The real value of goods or service can only be defined by the ultimate customer". Defining the ultimate customer in a construction project is a difficult task. The building's owner is defined as the suppliers' client and thereby customer, but the ultimate customer is the user of the building. Womach and Jones [27] point out that value is only meaningful when it is expressed in terms of a specific product that meets the customer's needs at a specific price at a specific time. Although this leads us to the individuals who work in the building as the end users, the fact that every stakeholder has its own value perception cannot be neglected [26].

Value creation in a project depends on the relative amount of value that is subjectively realized by a target user who is the focus of value creation - whether individual, organization, or society [28]. Various stakeholders in a project have different views on what is valuable. The difference is because of unique knowledge, goals, context and conditions that influence how the novelty of the value is conceived and evaluated. The stakeholders may also have competing interests and viewpoint of what is valuable [28]. However, according to Coenen and Alexander [7] perceived value and value creation are the result of cooperation among all stakeholders, and the success in collaboration between actors contributes to value creation for all stakeholders.

In construction projects, different stakeholders try to define value from their own perspective. Value creation depends however on how the needs are satisfied. There are three main roles whom the needs should be assessed in a project in order to maximize the value creation i) the owner ii) the suppliers iii) the users [26]. According to Samset [29] owners' focus on long term perspective, users' focus on the effects related to using the products and the suppliers' perspective focusing on the deliverables or outputs from the project are needed to have successful projects. Users need to have their functional and hedonic value fulfilled, owners should fulfill the users' value and have profitable/optimal operation and suppliers must fulfill users' value and produce effective and efficient [26].

Projects must have their reason based on organization's business strategy and goals [3]. At the same time, the trigger for any project is a predicted or existing customer need. Strategies must be aligned with user's needs. Although corporates can choose different strategies, the literature shows that there is a clear connection between the project owner or corporate strategies and value creation in projects. At the same time, the focus on the customer value in order to create value reveals the importance of aligning corporate strategies with customer needs in order to maximize the value creation. There is, however a need for clarifying all these requirements for value creation by performing a systematic approach to prioritize, measure and monitor the fulfillment of these requirements throughout and even after the project. The Norwegian research project "Oscar" conducted an extended literature review to map the characteristics and means for value creation in construction projects. The research showed that the characteristics which contribute to value creation can mainly be divided into four groups [4].

- Economic value (Core business cost, investment cost, economic value)
- Social value (People and organizations)

- Environmental value
- Physical value (space and infrastructure)

Traditionally, the assessment of the success/failure of construction projects has been based on evaluation of the extent of achieving the client's objectives like cost, time and quality [30]. Although these three measures can provide an indication of success or failure of a project they do not, in isolation, provide a proper picture of the performance of the project. Besides, the implementation of these measures are apparent at the end of the projects, and therefore they are rather "lagging" than "leading" indicators of performance [31].

Although success can be measured in terms of achieving the objectives, there is ambiguity in determining whether a project is a success or failure. Every project has a set of goals to accomplish. There is a need for criteria to compare the goal level against the performance level, and project success is to attain project goals and participant satisfaction. Criteria such as profitability, technical performance, completion, functionality, health and safety, productivity, and environmental sustainability, are also important aspects for evaluation. attainments of goals like satisfaction, absence of conflicts, professional image, aesthetics, and educational, social, and professional aspects are also considered as indications of project success[2].

Chan [2] points out that project performance has been a topic of great interest for scholars recently and present 3 trends in measuring project success:

- Meeting objectives: Achieving client's objectives. Tangible means (time, cost, quality), less tangible criteria.
- Global Approach: Considering project success criteria from both subjective and objective points
- Beyond project: Considering positive effects brought about by the project as well as the tangible means.

This brings the discussion further to looking into the success in construction project in a life cycle perspective rather than just project perspective. In engineering tradition, the project is fundamentally about delivering an objective during a defined life cycle [32]. According to Morris [32], the distinction between projects and non-projects is that all projects, no matter how complex or trivial, go through a common life-cycle development sequence. Whole organizations can be set up to achieve specific objectives within given time and cost constraints, and that will consume resources. However, it is the act of going from concept, through definition, development, and build, to handover. In this respect, several different life-cycle models exist that truly distinguish projects from non-projects.

Figure 2 illustrates the life project cycle phases that Morris suggests.

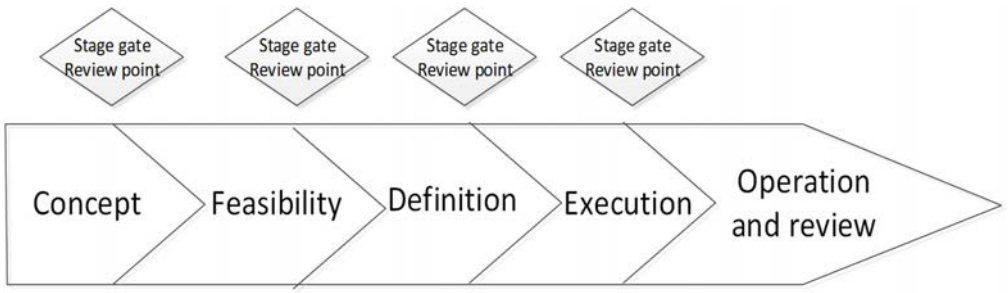

Figure 2 The Project Life cycle [32]

PRINCE2 [33] points out that projects are different from the normal operation of the organization when they:

- have specific objectives to deliver new benefits to the taxpayer, companies, the general public, the government, the sponsoring organization, stakeholders, and/or delivery partners
- may introduce significant changes to the way the business operates
- create new outputs and/or deliverables that will enable benefits to be realized

- have a specific, temporary management organization, and governance arrangements set-up for the duration of the project are susceptible to risks not usually encountered in the day-to-day operation of the work of the organization
- involve a range of stakeholders from different parts of the organization and beyond
- may use methods and approaches that are new or unfamiliar.

This tradition has had a strong focus on the project delivery and it should be defined according to the triple constraints (i.e. time, cost, and quality) that are often referred to as the 'iron triangle'.

5. Analysis of theoretical background

This research has its focus on the three main stakeholders in the project (user, owner and suppliers). The success in the project, positive effect brought by the project and value creation for society is not in focus at this stage of the development process. Table 1 summarizes the authors' synthesis of the literature review with the main findings about the concepts that are studied and keys to achievement of results.

Table 1. Analysis of the theoretical background

Identified concepts	Main findings	Keys to achievement
Value	Difficult to conceptualize and define. Different definitions in different contexts. Common ground is the fulfillment of needs and perception of users	Satisfaction of users' needs will result in valuable products.
value creation	Difficult to conceptualize and define. Fulfilment of users' needs alone is not enough for value creation.	User's value and owner's strategies must be aligned and suppliers must have effective and efficient production processes.
Success in project	Traditionally has been based on achieving objectives like cost, time and quality (project perspective) Should be assessed in a lifetime perspective. Client's and users' objectives related to operation phase should be included	Achievement of owner's and user's tangible and intangible objectives as well as the positive effects brought by the project.

The focus on value and value creation, the need for a tool that is "leading" rather than "lagging", together with a systems as a tool for improving performance indicates that a value based model can be beneficial in a project. The model should focus on identifying what creates value for user and owner in the operation phase of the project and exploit this knowledge in design phase (Feasibility and Definition). The model should also contain a process for quality control so that the identified elements are evaluated and implemented as intended.

6. Conceptual framework for enhancing value creation

The conceptual framework described in this chapter provides a step by step model for identifying the needs, creating ideas and solutions to fulfill the needs and monitoring the implementation of the ideas.

The framework suggests a step by step process starting with identifying what is considered as value creating elements based on the users' needs and the owner's strategies in each project. The next steps intend to present how these elements can be transformed into descriptions, evaluated and implemented during the project. Evaluation of the ideas is followed up with a decision point where ideas which are approved will be implemented. Unapproved ideas will be either excluded or sent back to step 1 where they will be revised and go through the process again. The framework also provides an overview of what the objective of each step is and what the expected results of each step are. The process contains five main steps; i) Identification, ii) Idea creation, iii) Idea evaluation, iv) Implementation, v) Measurement of the results.

Evaluation and measurement process is highly complex and subjective. It involves a combination of basic assumptions underlying the activity being evaluated and of personal values on the part of both those whose activities are being evaluated and those who are doing the evaluation [34]. American Public Health Association [35] defined

evaluation by “the process of determining the value or amount of success in achieving a predetermined objective”. Scriven [36] stated that evaluation is “The process of determining the merit, worth or value of something”. These definitions are according to our concerns about ex-post evaluation of projects and suitable in out conceptual framework. However, parallel with this research, an extended research has been conducted by our fellow scholars at Norwegian research project SpeedUp on project evaluation. That research has resulted in a framework for project evaluation on strategic, tactical and operational levels (PESTOL model) which can be used in our model. The results of the research is an article in press to be published in International Journal of information systems and Project Management in 2016.

The framework based on the first stage of the development process is presented in Figure 3. The steps are independent from project phases. Some of the ideas/actions should be implemented during the early phases of the project; others might have to be implemented during the execution phase. It is however important to start the process as early as possible, preferably at the first stage gate right after the main concept is chosen (See Figure 2).

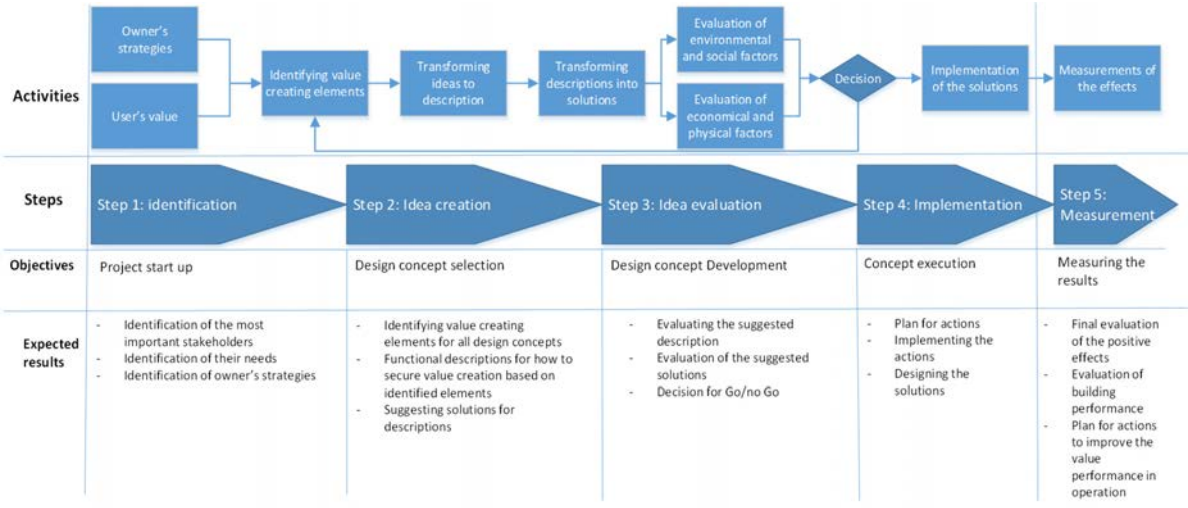

Figure 3 Conceptual framework for value enhancement in projects

7. Conclusion

Value is created when needs are fulfilled and strategic goals are achieved. The literature study reveals that value creation in a building in a life cycle perspective depends mainly on two factors; i) fulfilment of the users needs ii) fulfillment of owners and the corporate’s strategy. In a project perspective the efficiency and effectiveness of suppliers is also of importance. Increasing the value creation of a production system is another field of study with focus on execution phase of the projects. This paper has had its focus on early phase; hence, this field has not been in focus.

The framework presents a method that enables the project to move the focus from the project perspective to lifetime perspective. Implementing such a methodology will help the decision makers to move the focus from what is best for the project to what is best for the users and owner.

The process should start early in the project but the steps are independent from project phases. However, it should be clear when the actions and solutions are expected to start and finish. That means the actions should be transferred to the project time schedule after they have been through step 3.

There are already known tools and processes available for identifying environmental, economical and physical value elements. Classification systems like BREEAME or LEED can be used to cover the environmental issues. LCC analysis can be used to evaluate the economical elements. Multimap is an efficient tool for measuring technical condition as well as adaptability and usability of buildings [37].

Different building types will have different value characteristics. Further research should be conducted to identify what creates value for owner and user in buildings. Oscar project is also attempting to create a guideline for project

startup in order to help the owner to determine proper ambition level for the building. This guideline will also be a great contribution to the first step of the process. The framework should be tested in case studies. Testing the methodology will provide information about how the process functions in projects. This information can help us improve and streamline the processes. Further research will also be conducted to investigate i) existing tools that can be helpful during the process, and ii) the need for new tools that should be developed.

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