
VALUE PROCUREMENT APPROACH AND TOOLS FOR REAL ESTATE SECTOR

Juha Hyvärinen, Senior Scientist, juha.hyvarinen@vtt.fi
Pekka Huovila, Principal Scientist, pekka.huovila@vtt.fi
Janne Porkka, Research Scientist, janne.porkka@vtt.fi
VTT Technical Research Centre of Finland

ABSTRACT

The building sector is traditionally focused on reducing the investment costs, rather than on total facility life cycle value creation for the benefit of owners, users, the environment and the society. The challenge is not only to consider different stakeholder perspectives, but also how to incorporate different kinds of values (economic, environmental, social & cultural) in one holistic value model approach. We propose a framework for value creation from very early stage visioning to value commissioning and facility use, to obtain and maintain high value services and brand. The framework links value, process and business model aspects employing value metrics. The metrics provide a systematic knowledge management approach for capturing stakeholder needs as key performance indicators (KPIs), consistently applied in different phases. The KPIs are implemented in an online tool and service to identify stakeholder needs and to ensure that the project targets are met. Finally, based on the findings from a case study where a public facility owner and construction client evaluated the approach with the online service, its potential not only for value creation in individual projects but also for benchmarking purposes is discussed.

Keywords: Knowledge management, KPIs, Value creation, online service

1. INTRODUCTION

The building industry has a tradition of seeking competitive edge by targeting to produce the (minimum) required quality with the lowest possible cost. This seems to be the prevailing strategy still today, even though it has been strongly criticized by unhappy customers and authorities, who are more concerned with the total facility life cycle value and benefits for the owners and changing users as well as the impacts on the environment and the society. Alternative, attractive models have been suggested, such as the Value-Price-Cost model presented by De Ridder and Vrijhoef (2004), plainly illustrating that when the price is negotiated in the margin between the (provider's) costs for product or service and their value (to the customer), there are two ways to increase the margin and allow more room for client benefit (value for money) and/or provider's profit: either by cutting costs or by creating more value.

The first way - the prevailing one - has its obvious limitations in terms of being able to truly satisfy user and society needs (and also in terms of how far down the costs can stretch); the latter one, on the other hand, would inherently be client orientated approach, and therefore more directly linked to end user (and society) focus – and there is no pre-set (theoretic) upper limit to it. Naturally, combining the two approaches will maximize the margin for client benefit and provider profit. The challenge here is not only to consider different stakeholder perspectives (Leinonen et al. 2003, Huovila 2005), but also how to incorporate different kinds of values (economic, environmental, social & cultural) in one holistic value model approach.

While trimming production costs already may be reasonably supported by proven methods and tools (such as integrated design & production systems, industrial production, lean thinking etc.) and is not hampered by current project delivery systems and contract forms, value optimization on the other hand still lacks proper procedures and sufficient tool support (e.g. service configuration and performance monitoring) and is not likely to become major business model under present day contractual frameworks that do not provide incentive for (or even prevent) continuous improvement and innovation.

Currently, there exists no tool, nor any holistic model or method for the evaluation of different value propositions considering all aspects of life cycle costs and values (economic, ecological, social, cultural, etc.), even though e.g. the preliminary axiological model proposed by El-Gohary (2010) is a step in this direction. Creating additional value is still a rather new concept in the building industry and as such it is not yet driving business models or being enabled by contract forms. As a result, value driven processes and supporting models, methods and tools are not implemented in practice even if they exist.

More precisely, the core idea missing is a holistic approach that would include (i) a framework for value driven real estate procurement (ii) value models, taking into account different aspects (iii) a generic model that could be implemented in current decision support tools, and (iv) procurement and contract models to implement business models with value driven solutions.

2. APPROACH AND VALUE FRAMEWORK

In our approach the value creation in facility life cycle is captured in a dial (Figure 1) with eight steps representing distinct phases with expected outcomes (outer circle) of value-driven activities (inner circle). Depending on the situation (the facility related problem or need) the dial may be entered in any given step, but the ultimate goal (usually) is in maintained value and/or brand of facility in use.

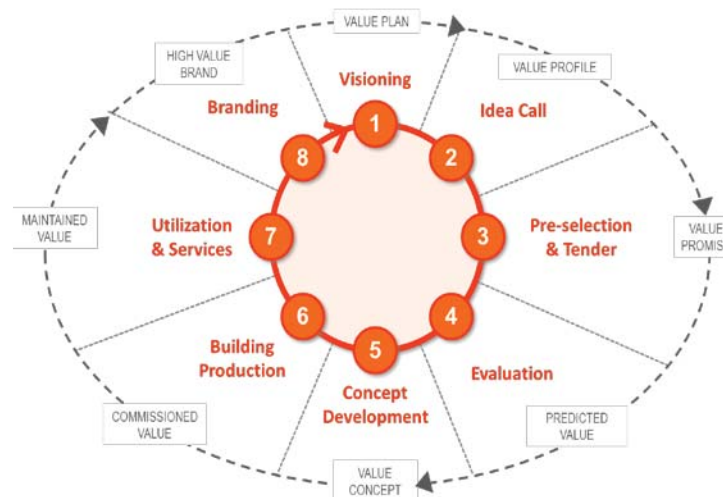


Figure 1: The proposed Value Dial for facility life.

Present building processes in different countries have been mapped and their deficiencies studied in number of research projects. We propose a value framework that is independent from existing practices focusing on phases that provide opportunity space for value creation to and value sharing with different stakeholders. These eight steps for value are developed from earlier work on value driven business models for sustainable and cost-effective customer-oriented housing (Huovila et al. 2009) that looked at value proposition and value networks as described by Chesbrough and Roosenbloom (2002). Various project delivery systems can be applied for value procurement using our proposed Value Dial.

Our objective is to support the processes related to all the value creating activities – not only those traditionally focused on in building industry, namely Building Production (i.e. design and construction) and to some extent Concept Development and Utilization & Services. Firstly, this requires recognizing the key processes also in the very early steps as well as in brand management; secondly, the critical

methods and tools to support these processes need to be identified. Consequently, we propose a framework for value creation from early stage visioning to value commissioning and facility use, to obtain and maintain high value services and brand.

The key business processes can be identified in 8 steps of the Value Dial and placed in the Framework (Figure 2 on next page) linking value, process and business model aspects, employing value metrics (strategic – tactical – operational KPIs explained in chapter 5). Key processes with expected outcomes shortly described:

1. Visioning: Strategic briefing process to identify customer segments end user needs, as well as opportunities to strengthen the brand (of facility or its providers, owners and occupants). The outcome is a *Value plan* (strategic objectives expressed by selecting appropriate strategic KPIs): Informative document describing expected business values, user experience, social and cultural values – at anticipated magnitude of cost and environmental impact.

2. Idea Call: Target setting process with stakeholder participation & innovation to produce tender documents. A *Value profile* is defined: customer profiles, facility performance criteria and affordability (initial tactical KPIs).

3. Pre-selection & Tender: Feasibility study of received novel openings from idea call to determine a *Value promise* (interpretation of providers' value propositions) in one or several phases, e.g. by competitive dialogue: in 1st phase pre-selection of development partners via interviews to determine communication and collaboration skill, development potential (using relevant tactical KPIs), and in 2nd phase tender for further developing the idea in terms of cost, performance and sustainability criteria (using relevant tactical KPIs).

4. Evaluation: Target tracking (and adjustment) processes in multi-criteria assessment and selection of development partners with user participation and instructions to providers as well as idea pre-acceptance by authorities. Outcome will be *Predicted value* (for the customer): *Commitment to value promise* (by the providers) expressed in tactical KPIs.

5. Concept Development: Collaborative planning process with customer engagement. *Value concept* is set: Selected and customized manufacturing and assembly concept, service concept and financing & risk concepts (operational KPIs derived from tactical KPIs).

6. Building Production: Target tracking through user centric design and configuration, lean production and supply chain management, concurrent commissioning. *Commissioned value:* Achieved process and product targets in terms of verified operational KPIs and possible tactical KPIs.

7. Utilization & Services: Operation and use employing governance principles and continuous performance monitoring, including benchmarking for interaction (user business operations – facility services) to ensure user satisfaction and detecting changing needs and opportunities for new services. *Maintained value:* Conformance of facility and services to value promise commitment and emerging new needs (measured in tactical and strategic KPIs).

8. Branding: Brand management ensuring public awareness of good performance, environmental, economic and social sustainability; communicated via certificates and performance & customer satisfaction scores. *High value brand:* strong brand image, evaluated e.g. by customer surveys (strategic KPIs).

In the following chapters, fundamental business model issues are briefly discussed, and then the indicators and tools are addressed by presenting a generic value metrics framework and its application in a case study with an ICT tool for customer needs management.

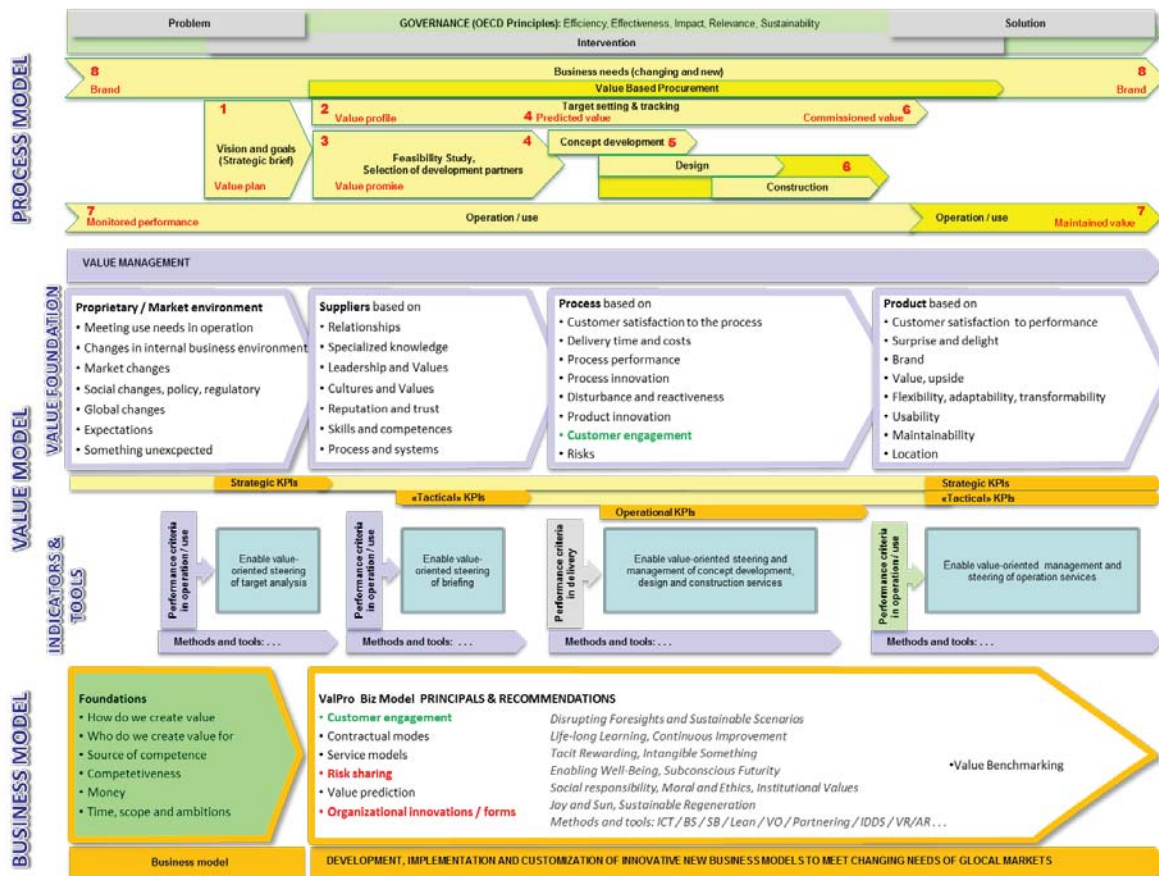


Figure 2: Process model, Value model and Business models in a Governance Framework.

3. VALUE PROCUREMENT

The procurement strategy should be developed to support the increase of value based on project objectives. The selection of the most appropriate project delivery system (PDS) is the core component for such strategies. Factors influencing in the selection are numerous but the potential to support the achievement of the owner's objectives is a key determinant. For instance, if the owner assumes that the specific expertise on the performance of a building is not available in the market and thinks itself (the owner) to be the best expert on that matter, it may well decide to use Construction Management (CM) or Design-Bid-Build (DBB) where these issues can carefully be pondered with a consultant before inviting bids from contractors.

On the other hand, if the owner is ready to define challenging enough target levels and supposes that the companies in the market are more familiar with the latest technological possibilities, the owner may end up with using a system where candidates prepare competing proposals to meet the set challenge, e.g. competitive Design-Build (DB). While performance guarantees can be incorporated into a DB contract, Design-Build-Operate (DBO) inclusive of service provider's facility management makes the contractor more clearly liable for the functioning of the facility. This is the case since the performance of the facility is usually also used as a payment basis for the service provider. With financing (DBFO) the influence is usually even stronger due to the control of financiers.

Alliance Contracting (AC) offers a solution when the challenge is relatively untried and risky but value objectives of the project are communicable to others: then early involvement of all key actors would offer added value for the project. Therefore, it is an option for any experiments for improved performance. Yet, the determination of procurement strategy is not merely selecting the PDS but it also involves planning the procedures related to the acquisition of service providers and their compensation,

etc. There are numerous factors and constraints influencing the strategy determination which means that the result may not always be the absolute optimum from the viewpoint of improving the value of the project specifically.

Lahdenperä (2012) observes that collaborative construction project arrangements have been the subject of many development efforts owing to the frustration felt toward the opportunism inherent in traditional contracting. Globally, three approaches have stood out: project partnering, project alliancing and integrated project delivery. The value objectives can and have to be fostered also independently of the PDS used. Thus, it is reasonable to focus on the means available to foster the achievement of project objectives in case of different PDSs in more general terms.

4. VALUE INDICATORS

The proposed value metrics framework covering economic, social and environmental dimensions is supported by process components (Figure 3). This value indicator framework can be applied in different phases during the life cycle so that the strategic objectives early in briefing can be interpreted as more concrete tactical and operational targets during concept development and production phases, and assessed again during operation. The figure below shows that also other indicators, e.g. company specific ones, can be combined with the same value indicator framework. It may serve as a common framework for the selection and prioritization of indicators depending on the local conditions, building type and also the nature of the project.

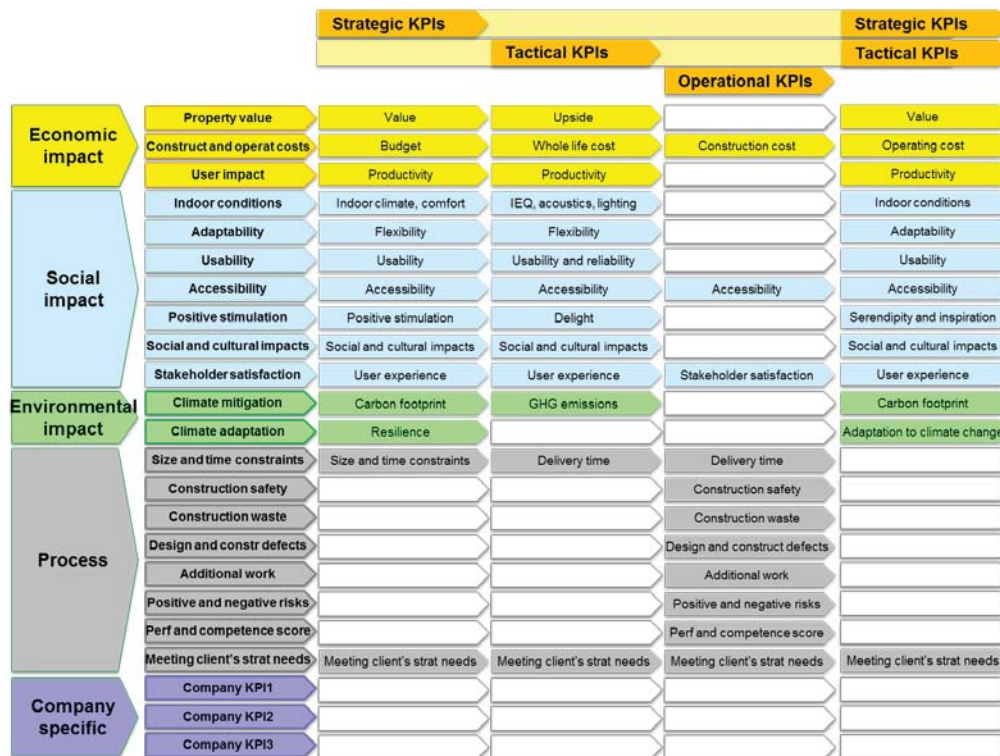


Figure 3: Value metrics framework.

The 22 core indicators of this framework were selected and specifically described to set the desired goal and target in the briefing phase as well as to assess the achieved performance during the operation phase. That system was developed into an online service that is described in the following chapter.

5. ICT TOOL

This chapter introduces a new ICT tool called needscape for customer needs management. It is an online service developed for assessing core value indicators both in the target setting process (briefing) and during the use period (operation). Its primary utilisation as mapped into the Value Dial (Figure 1 earlier) is in steps 2 (Value profile for Idea call), 4 (Evaluation of the Predicted value) and 7 (Utilization and services of Maintained value). The main results of assessments performed by experts are published as building value benchmarks. These benchmarks are based on 22 common indicators and the service enables transparency between experts and other stakeholders, especially building users. The main page of this service is illustrated below in Figure 4.



Figure 4: Main page of the needscape service.

The indicators in the ICT tool have been selected together with a major public building owner. Therefore, those are a combination of the internal metrics of that particular building owner, the national IEQ system and their other practices, as well as key findings from a recent European Indoor Performance indicator project (Desmyter et Al., 2011). These indicators are grouped into five categories, as visualised in Figure 5: Economic impact (4 indicators), Indoor Environment Quality (6 indicators), Performance in use (5 indicators), Environmental impact (4 indicators) and Process (3 indicators). Additionally, the relative importance of each indicator in the structure has been weighted by the building owner. For the user, each indicator is described in a template that summarises essential information for their assessment, such as description, assessment criteria in briefing and operation phases, performance level descriptions and references to standards, best practices etc. In a building project, each indicator is valued by selecting the most appropriate class from A (best with today's available technologies) to E (lowest). Within this scale, class D equals to current national regulations (which may not always be met by existing buildings, therefore class E).

Within the service, registered users (members), after signing in, are able to add a building and associated indicator benchmarks as well as to edit their already created project or delete an existing one. When selecting the class from A to E for each indicator, details for each assessment can be explained in a comment. After assessments are made, the results are first private and only the account holder has an

access to view them. The member may choose to publish the results to public area, where everyone in the Internet (guests) have access. Since publishing from the private areas to the public has been made extremely easy and straightforward, the service promotes transparency.

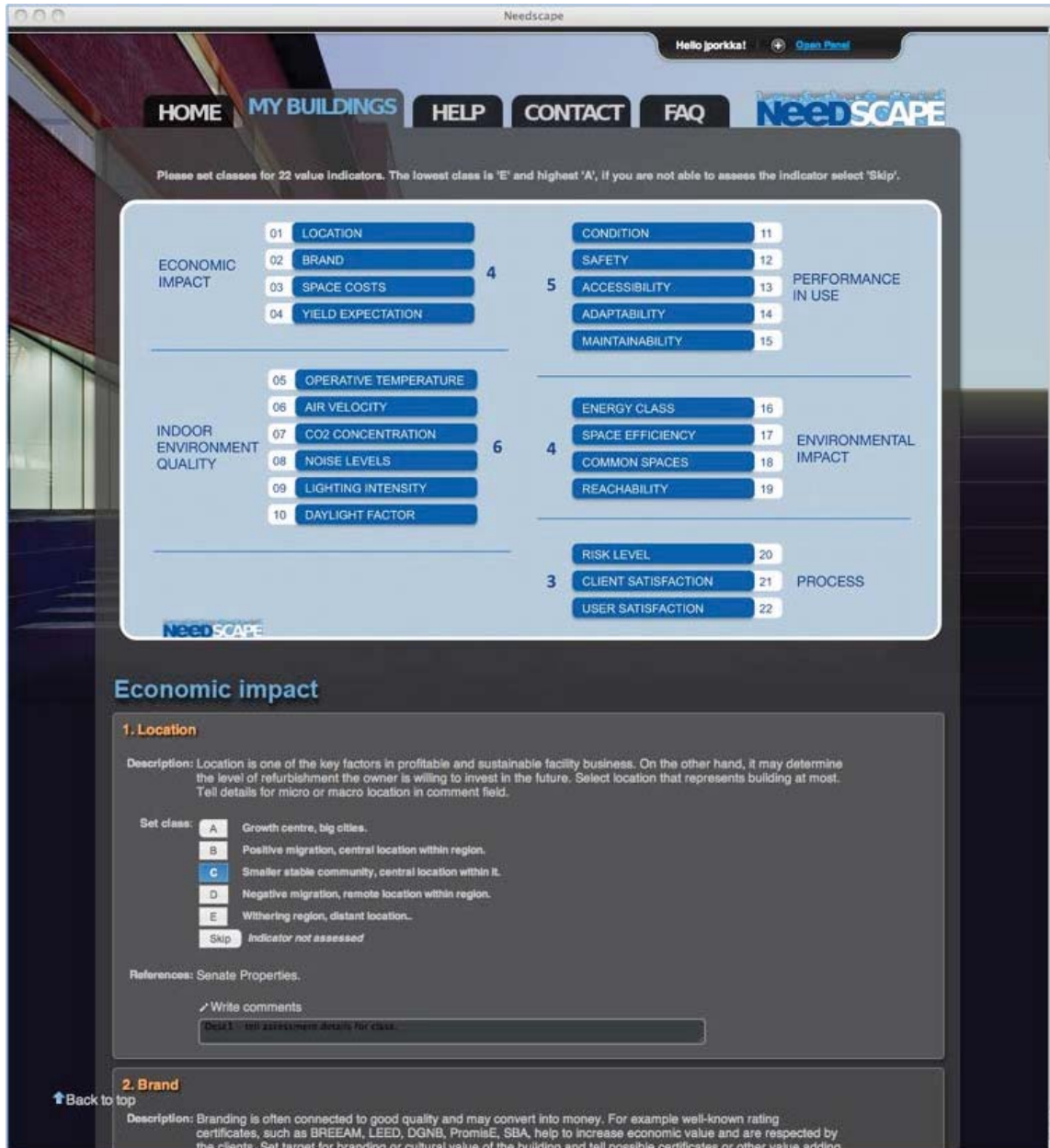


Figure 5: The assessment of 22 core value indicators.

The value benchmarks in the service are calculated through the weights and values of the individual indicators, and presented in a building profile (see Figure 6). The profile presents benchmarks in a rated numbering scheme between 0 and 100 points for the whole building and each of the 5 categories. The assessments are presented visually and the length of light blue beam symbolises the excellence of each indicator.

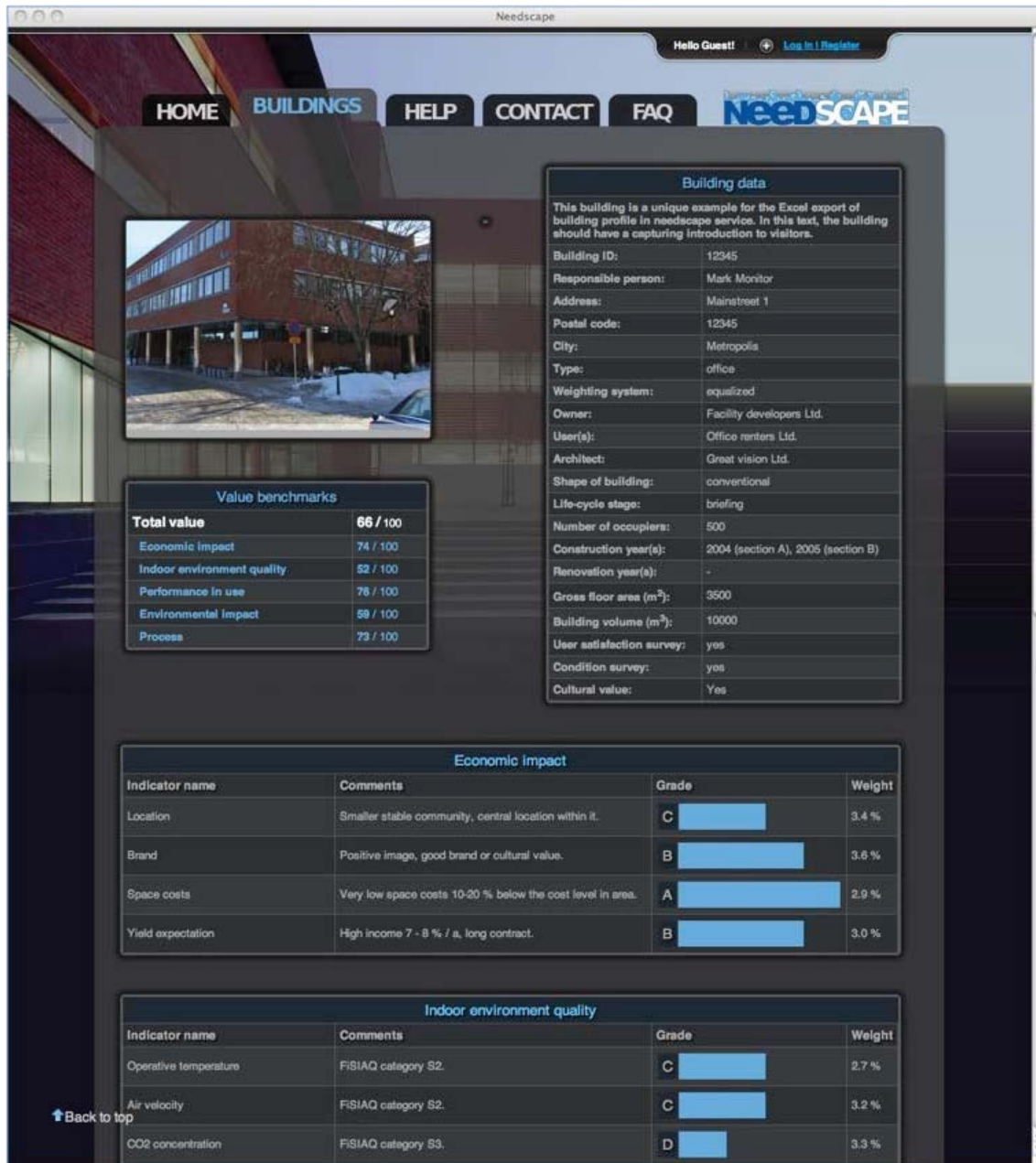


Figure 6: The screenshot of building profile with value benchmarks and visual indicator assessments.

Users learn the basics of use from 'how to start' section and get acquainted with the approach in Frequently Asked Questions (FAQ) section. The service is an easy-to-use gateway for building owners to publish value benchmarks from selected buildings both transparently and graphically to other stakeholders, users and citizens. The building profile in published projects is visible to everyone. At the end of the building profile report, the account owner has also an option to export results to Microsoft Excel and PDF. Screenshots for both export reports are shown in Figure 7.

Category	Indicator	Grade	Score
ECONOMIC IMPACT	01 LOCATION	C	3.4
	02 BRAND	B	3.6
	03 SPACE COSTS	A	2.9
	04 YIELD EXPECTATION	B	3
INDOOR ENVIRONMENT QUALITY	05 OPERATIVE TEMPERATURE	C	2.7
	06 AIR VELOCITY	C	3.2
	07 CO2 CONCENTRATION	D	3.3
	08 NOISE LEVELS	C	2.9
PERFORMANCE IN USE	09 LIGHTING INTENSITY	B	3.1
	10 DAYLIGHT FACTOR	B	1.9
	11 CONDITION	A	3.7
	12 SAFETY	B	3.4
ENVIRONMENTAL IMPACT	13 ACCESSIBILITY	C	3.3
	14 ADAPTABILITY	B	1.2
	15 MAINTAINABILITY	B	4.4
	16 ENERGY CLASS	C	4.7
PROCESS	17 SPACE EFFICIENCY	A	2.8
	18 COMMON SPACES	C	5.2
	19 REACHABILITY	C	3.7
	20 RISK LEVEL	B	3.7
TOTAL VALUE			66

Category	Indicator	Grade	Score
Economic impact	Location	C	3.4 %
	Brand	B	3.6 %
	Space costs	A	2.9 %
	Yield expectation	B	3.0 %
TOTAL VALUE			

Figure 7: Screenshots for building profile exports to Microsoft Excel and Adobe PDF.

6. DISCUSSION

The industrial development partners representing the value chain from *owner – client – contractor – system supplier* points of view have shown interest towards value procurement from their interest perspectives. The clients find it important to describe the value profile into contracts in a way it can be assessed as commissioned value and how that value increase could be incentivized during the process. The contractors and suppliers think about opportunities to prove the added value of their solutions to the client and about the mechanisms to share the value.

In successful value procurement it is important to develop and apply project delivery systems that support also characteristics of today's market environment, such as flexibility to changes during the delivery process. It would be valuable to all actors to have transparency on responsibilities due to changes that may increase the value of the project. Using reliable metrics and appropriate tools to support controlling such procedures and providing space for innovation should leave little incentives for future disputes.

The experience from a short test period of needscape service with a large building owner/client has been promising for value benchmarking. Many features, such as ease of use via simple user interface and the clear presentation of building profiles both on screen and in the exported reports have accumulated positive feedback. There is strong potential for using this kind of an online tool for managing and communicating the targets between building owner's personnel who are responsible for different aspects of value creation (at different stages), and towards other stakeholders. A common set of core indicators in the tool maintains comparability between different facilities of same type, and a major potential future development lead is to provide service for building project portfolios because that approach provides opportunities to managing several projects and pinpointing their status quo within the building stock. Since the service operates so far only in English, another issue to consider in the future is translation of

user interface to users' native language(s). Furthermore, the applicability of this service to all life cycle phases should be discussed.

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