

DEVELOPING PROJECT VALUE ATTRIBUTES: A PROPOSED PROCESS FOR VALUE DELIVERY ON CONSTRUCTION PROJECTS

Salam Khalife¹, Seyyedbehrad Emadi², Deon Wilner³, and Farook Hamzeh⁴

ABSTRACT

Increasing efforts are being made by lean researchers and practitioners to improve value delivery in the built environment. However, the preliminary process to identify a substantiated list constituting the interests, desires, requirements, and design essentials of different stakeholders on projects is still vague and unorganized. Establishing the Value Attributes List (VAL) is considered fundamental for delivering value. Thus, to answer the question of how to develop the VAL, a set of guidelines and steps are provided. The process was constructed by performing action research and engaging two case studies depicting two Canadian public projects. This paper also provides a generic list of value attributes to be the starting point for the project team. The list included the major categories to be considered on projects. Findings suggested that developing a customized team-led list is particularly important and pursuing a clear direction on the subsequent steps for monitoring is required. The research concludes that an in-house advocate is needed to (1) promote the process and move it onward, and (2) to make sure the whole team and project stakeholders understand the importance of these value discussions.

KEYWORDS

Design management, benefits realization, collaboration, value delivery, value creation.

INTRODUCTION

At the onset of projects, owners or developers typically go for consultation to determine important decisions including the decision to launch their projects. Project initiation is an important phase authorizing a new project (Project Management Institute, 2004). Business cases and feasibility studies are thus prepared based on the general vision offered by owners and sponsors. With the project's goals in mind, the owner's team would identify a set of general requirements and limitations called Owner's requirements. Here the owner value proposition is equivalent to the business case and the reasoning behind

¹ Ph.D. Candidate, Civil and Environmental Engineering Department, University of Alberta, Edmonton, Canada, khalife@ualberta.ca, orcid.org/0000-0003-1907-4547

² Ph.D., Universitat Politècnica De Catalunya, Barcelona, Spain, seyyed.behrad.emadi@upc.edu, orcid.org/0000-0003-3091-5108

³ Project Manager, IPD practitioner, ISL Engineering and Land Services Ltd., Edmonton, Canada, dwilner@islengineering.com, orcid.org/0000-0003-1881-809X

⁴ Associate Professor, Hole School of Construction Engineering, University of Alberta, Edmonton, Canada, hamzeh@ualberta.ca, orcid.org/0000-0002-3986-9534

the project initiation (Hjelmbrekke et al., 2017). Then, Project Objectives are developed which embrace the funding requirements, Base program, Added Value incentives Items, Base target Cost, Final Target Cost, Milestone Schedule, and any other objectives agreed to by the parties (CCDC 30 Integrated Project Delivery, 2018). Therefore, with complex projects and in a fast-changing environment, the vision and project goals need to consider the wider perspective of different teams and stakeholders (Laursen & Svejvig, 2016). The general requirements and the needs of different stakeholders are thus harder to compile on the onset of projects. To this end, the recognition and creation of value on construction projects is directly dependent on clear strategic thinking (Normann & Ramirez, 1993) including the engagement with diverse stakeholders and meeting their needs.

The briefing exercise has been a major process performed to identify the needs, desires, and aspirations which are translated into design criteria and design concepts (Ballard & Zabelle, 2000). The exercise includes a meeting that encompasses the key stakeholders. The result of such exercise is a brief, which is a formal document that records the needs of the involved parties. However, concerns about end-users' needs being generally overlooked are reported, leading to end-user dissatisfaction (Pemsel et al., 2009). Other concerns are discussed in the literature including the impact of project brief clarity on project performance (Vahabi et al., 2020). Additionally, Pegoraro and Paula (2017) identified the critical factors affecting the requirements' identification process, including: the lack of open and effective communication, lack of clarity of the objectives, lack of precision in defining client's requirements, client's inexperience, difficulties in accommodating requirements of all involved stakeholders, among other problems. The study also provided some guidelines for overcoming such problems within design, focusing on information clearness to define objectives. Nonetheless, the study suggests future research to investigate more the requirement engineering and requirement management practices. Moreover, additional research was called for to maximize value creation for stakeholders with theoretical and empirical antecedents (Rojas & Liu, 2015). In short, requirements identification and value generation are interconnected concepts; thus, there is a need to revisit their approaches to identify them in a coherent manner.

While identifying owners' requirements might be thought of a basic and clear process, practitioners expressed their concerns about owners avoiding the detailed identification of their requirements to prevent future change orders, as they are proved to be the major cause for change orders due to changes in their requirements and scope (Khoso et al., 2019). Additionally, the problem lies in either the inability of the client in describing their needs, or the unconsciousness about the exact requirements and desires, with some needs surfacing late in the process (Wandahl, 2004). Moreover, the lack of a clear process to develop the value targets is also a prevailing issue. In this paper, we will be focusing on the phase where the owner had gone through the steps of establishing the preliminary vision and goals of the project, and now there is a need to develop a set of attributes representing the requirements and needs of the different stakeholders and what they value. Different stakeholders in building perceive projects' value differently and have diverse requirements (Haddadi, Johansen, et al., 2016). Though these value considerations depend on the involved parties and the nature of the project, identifying some general and basic concepts connected to the value of building projects as perceived by different stakeholders is needed. The literature calls for maximizing the environmental, social and economic value of projects as part of the sustainability trend and demand, however, it overlooks the other core value attributes justifying this that it is context dependent. The main problem is that value attributes impact one another and are correlated which

mandates the need to explore them in a structured inclusive way, to avoid the challenges imposed by overlooking the diverse values of myriads stakeholders. A need to investigate who is interested in what, and who is responsible for attaining the value attributes is vital.

Consequently, the research herein is trying to answer the following questions: (1) What are the basic and main value considerations discussed in the literature and need to be considered on a project? And (2) How to identify a customized clear and inclusive value attributes list that reflects what is needed to have a successful project? The research contributes to the body-of-knowledge by proposing the essential early steps needed for preparing a solid and cohesive project value attributes list and advising on the topics that need to be considered for this list. The list is considered the foundation for delivering successful projects in terms of their intended value. The literature had focused on the subsequent steps in the value delivery framework, therefore, aiding the initial steps within the process was needed.

LITERATURE REVIEW

THE VALUE DELIVERY CONCEPT

The concept of maximizing value has been regularly called out to in the construction engineering and management literature. Specifically, maximizing economic, environmental, and societal value of the built environment is regarded as a trend and as a vision for the next 50 years (Levitt, 2007). Authors have then examined the numerous terms that were adapted in the construction literature in reference to value in the built environment. Thus, to resolve the discrepancies and the inconsistency, Barima (2010) conducted a study on the “best term which (if fulfilled) can be used to mean value in projects”. Results revealed three main terms: goals, standards, and needs as a representation of value on construction projects.

Benefits realization is another concept in relation to value generation, where the main challenge for generating value is understanding the project holistically and ‘generating benefits aligned with strategic intent’ (Tillmann et al., 2012). Mainly, value delivery includes: fulfilling goals, desirable, and standards, achieving end-users’ and teams’ satisfaction, meeting project purposes, and addressing hidden needs and intangible objectives (Barima, 2010; Haddadi, Temeljotov-Salaj, et al., 2016). Understanding the value concept and the value delivery context is the first step towards pushing for improved practices for achieving higher value on projects and from a life cycle perspective. Value delivery is not a straightforward process but offering guidelines and best practices would help in getting towards the goal. Value is dynamic by nature, so it tends to change throughout the project (Khalife & Hamzeh, 2019). Yet, the initial process of identifying the general value attributes during the early conceptualization of projects would help in avoiding changes downstream and increased costs (check “MacLeamy curve”).

CORE VALUES AND VALUE TRADE-OFFS

Core values is a common terminology used in companies or businesses offering services and/or products. On top of the core values come social responsibility and customer service. In construction, core values are discovered in different studies.

Emmitt et al. (2004) presented six key areas for value: Beauty, Functionality, Durability, Suitability (for the site and the community), Sustainability (respect for the environment), and Buildability. This value hierarchy is considered as the project’s objectives. Then through workshops, the team would specify the sub-objectives. A

distinction between process and product values is highlighted in the literature, where market value and utility value are types of product value, and the process value is related to the ethical value (Wandahl, 2004). Another research project, called “Oscar – Value for User and Owner of buildings”, highlighted the means which contribute to value creation (economic incentives, knowledge, contract, and processes and assurance quality), and identified 4 characteristics contributing to value creation: economic value (investment cost, core business cost, etc.), social value (people and organizations), environmental, and physical (space and infrastructure) (Bjørberg et al., 2015). Zhang & El-Gohary (2016) developed a value hierarchy that is based on the trio environmental, social, and economic value, and 50 sub-values were assigned to these categories.

Hjelmbrekke et al. (2017) explained about the importance of governance on enhancing value. They suggested a governance framework model with the following key components: strategic need (why questions), strategic effect (what questions/business perspective), project success criteria (intended outcome: user effectiveness and project efficiency), suppliers project business model (how questions: design team plan to align outcome to owner’s needs), and project business model (how: metrics/ KPIs).

Kheirandish et al. (2020) presented a comprehensive value framework for design and collected more than 500 responses on the Human Values Survey. Nine value groups were identified: carefulness, justice, ecology, respect for others, meaningfulness, status, pleasure, respect for oneself, and personal development. This value framework is meant for designers to widen their perspective on human values, so they address these in design.

Moreover, given the fact that requirements change during design development and the fact that conflicting needs exist on any project, a recent study by Serugga et al. (2020) suggested a design decision support model based on the utility theory to assess the changing requirements, compare competing alternatives, and predict emergent needs. In fact, conflicting needs on projects are pushing research to offer tools that help design teams in the trade-off exercise. Arroyo (2014) discussed in details different multiple-criteria decision making (MCDM) methods to help designers in their decisions to select sustainable alternatives and explained the advantage of the choosing-by-advantage (CBA) technique. CBA was recommended and tested on different studies; it proved effective in helping teams understand value vs. cost and that trade-offs between factors are not linear (Arroyo, 2014). Additionally, studies have been exploring models to measure value creation on projects and prevent value losses. Huovila et al. (1997) advised teams to (a) closely coordinate with owners about their requirements, (b) use systemized management tools for the requirements (for instance use quality function deployment (QFD), and (c) collaborate with all participants generating design and construction information (Huovila et al., 1997). These suggested practices, along with other improvement tools, such as interactive coordination, checklists before/after design, and value stream mapping, are expected to generate improvements in the design process and prevent loss of value on projects (Freire & Alarcón, 2002). Likewise, Giménez et al. (2020) proposed a value analysis model which helps in value loss identification through proposed indexes. The approach is important as it suggests a quantitative method for identifying value loss.

With these different studies and attempts to provide categories, value listings, and approaches for emergent needs and value loss identifications, this research builds upon these ideas and take one step forward as to identify the initial steps and guidelines to customize the list of value attributes. In this research, we define the value attributes list (VAL) to be the collection of project vision, guiding principles, and stakeholders’ needs by compiling both process and product value propositions to guide the design decisions.

METHODOLOGY

The objective of the present study is twofold; first, offering a generic list of value attributes as a template and starting point for discussion among the project team, and second, providing the recommended steps to develop the customized list of value parameters then follow up on the process of value alignment and attainment. To attain these objectives, the action research approach was adopted. Action research focuses on contributing solutions to a problematic situation by testing research and proposed methods in real life practice; it includes five phases: diagnosing, action planning, action taking, evaluating, and specifying learnings & reflections (Susman & Evered, 1978). The steps of the methodology are described in **Error! Reference source not found.** By following the action research approach, the proposed list and steps were validated in the action taking process discussed in the two case studies.

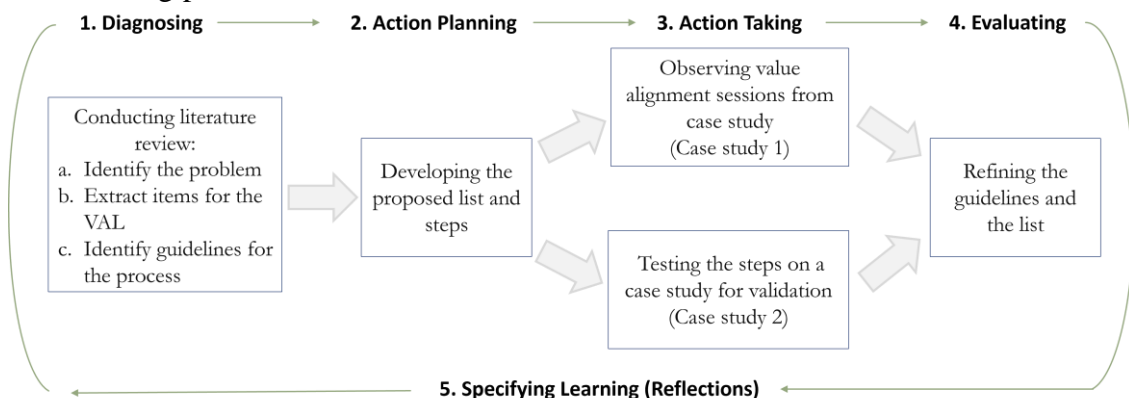


Figure 1. Action Research Methodology

The first step is diagnosing (1), it includes identifying the problem. As explained earlier in the introduction and literature, there is a need to advance this area specifically in relation to developing a substantiated team-led list and informing practitioners on the steps and best practices to do that. The problem lies in the unstructured methods usually performed in practice. After identifying the problem and the need for proposing solutions, the subsequent step was conducting an extensive literature review to extract the core values that are generic to any project. The construction management literature offered separate lists which we tried to consolidate to produce an extended collective list. Some guidelines and preferred practices were also extracted as part of the diagnosis and exploration. Then, the final list and the proposed steps are put together as part of the action planning step (2). Afterwards, for the action taking phase (3), two case studies were employed to (a) observe the value alignment sessions and assess them to extract best practices, and (b) implement and test the proposed process developed as part of the suggested action plan. Based on the results from the two case studies, the evaluation phase (4) was conducted. It involved assessing the outcome, thus far, from implementing the suggested process and then refining it as necessary. The final phase was specifying learning (5) by performing reflections on this implementation.

ACTION PLANNING: GUIDELINES AND THE PROPOSED PROCESS FOR IDENTIFYING VALUE ATTRIBUTES

In the attempt to investigate what are the major attributes to consider on a project in coordination with the team and extended list of stakeholders, and what are the attributes that guide the decisions while evaluating the different design alternatives, several rounds

of literature review was conducted by two of the authors. Based on what is offered in the literature, more than 135 identified keywords and factors were considered as essential on projects. Some of these keywords were similar in nature and therefore, the related terminologies were gathered under 31 categories. Another round of revision concluded to 16 value families, as revealed in Figure 2. The authors acknowledge that this list is not necessarily comprehensive as it is not a result of a meta-analysis or scoping review aiming for exhaustive searching. However, the authors acknowledge the particularity of different projects and their considerations. Nevertheless, the completeness of this list is not the aim of this study, instead, the aim is to produce a list to help project managers or consultants in leading the discussions about value attributes on projects. Therefore, the need for this list is pertinent to checking the areas that need to be investigated among the project team.

Beyond this list, actions need to be conducted and steps need to be followed in order to develop the customized list of what is of value for a specific project from the perspective of different parties. The key for this process is coordination/collaboration. Whether in a traditional setting, or in an integrated project delivery setting, the list of value attributes shall be generated beyond the sole requirements of the owner. Additionally, another important aspect of this process is the realization that the list might keep updating during the development of the project, as per the nature of projects and the dynamic nature of value which is affected by perceptions, values, needs, and desires. However, the last responsible moment is a concept to be kept in mind for revisiting the core items in the VAL. Then comes the notion: if everything is important, then nothing is important. Keeping this in mind, negotiation is an important process in the value assessment. While we identified 16 different families for the value attributes, **consolidating** the list is an important step through tradeoffs and negotiations. The CBA method mentioned in the literature is a good practice for selecting among alternatives in value attributes.

The detailed steps in the proposed process are represented in Figure 3. As a start, two main prerequisites are needed to launch the value discussions. First, the owner and his team should draft the Owner's general needs, goals and vision for the project based on the business case. This would include the owner's perspective on what he values for project success. This step is the first in terms of value elicitation on a project. The second prerequisite is obtaining the agreement of the Owner's requirements and needs with the project steering committee, where the team check if there is other pertinent information to add. Acknowledging the fact that the Owner could not identify the complete list of requirements and needs at the beginning, and that some information would be unknown to them, the process of value formulation is extended over several phases.

The first phase of the process is identifying the teams or stakeholders and it is a preparation step where an advocate for value attributes should be assigned. The advocate could be in-house from any of the Owner's or consultant's team members. They need to be a knowledgeable individual who would lead the discussion and dig into the heart of the stakeholders' values and needs. Their first mission though, is the identification and then classification of stakeholders as: manage closely, keep satisfied, keep informed, and monitor. With the stakeholders list ready and the Owner's general needs obtained, phase 2 – Generating the preliminary list, could launch. The project steering committee and the advocate could discuss the preliminary list offered in this paper. For end-user involvement, representatives from different users should be identified and they would be identified as the user groups. They shall provide their opinion and feedback on the VAL. The evaluation criteria are as follows: indicating the obligatory (regulations, codes,

standards), essential (important features), desired (good to have if the budget allows), neutral (indifferent about having it), resistance (against this value attribute or not desired) (Khalife & Hamzeh, 2022).

Environmental Considerations <input type="checkbox"/> Pollution prevention (air, water, light, noise, etc.) <input type="checkbox"/> Ecological Preservation <input type="checkbox"/> Resources conservation (water, energy, material, land, etc.) <input type="checkbox"/> Environmental resilience and Sustainability <input type="checkbox"/> Minimize landfill impacts and segregation of waste	Social & Cultural Respect <input type="checkbox"/> Historic preservation and justice <input type="checkbox"/> Local culture preservation and respect <input type="checkbox"/> Neighborhood quality improvement and community wellbeing <input type="checkbox"/> Community's needs in mind, connected social spaces, reconciliation, etc. <input type="checkbox"/> Equity, Diversity, and Inclusion	Health and Comfort <input type="checkbox"/> Indoor air quality <input type="checkbox"/> Thermal comfort and moisture prevention <input type="checkbox"/> Acoustics and Daylight views <input type="checkbox"/> Psychological impact <input type="checkbox"/> Ergonomic, barrier free and disable friendly design <input type="checkbox"/> Occupant interactions enhancement	Safety and Security <input type="checkbox"/> Fire and Electrical safety <input type="checkbox"/> Natural disasters resistance (floods, Tornados, earthquakes, etc.) <input type="checkbox"/> Indoor safety (slip, fall, etc.)	Aesthetics & Material <input type="checkbox"/> Building volumetric shape and form <input type="checkbox"/> Landscape and surroundings integration with the building <input type="checkbox"/> Iconic design <input type="checkbox"/> Unique/distinguishable Image and identity <input type="checkbox"/> Durable material selection with low operational & maintenance requirements
Financial Considerations <input type="checkbox"/> Total cost reduction and competitive prices <input type="checkbox"/> Asset value increase <input type="checkbox"/> Revenue increase & Tax benefit <input type="checkbox"/> Marketability <input type="checkbox"/> Low operating and maintenance costs <input type="checkbox"/> Effective use of existing infrastructure	Economy Improvement <input type="checkbox"/> Local real estate and business improvement <input type="checkbox"/> Employment growth <input type="checkbox"/> Urban development	Program, Zones and Accessibility <input type="checkbox"/> Spaces distribution and criteria (square feet per person per unit, relationships of spaces, ratios, etc.) <input type="checkbox"/> Building accessibility <input type="checkbox"/> Site requirements and analysis (legal description, zoning guidelines, restrictions, policy standards) <input type="checkbox"/> Functional Design <input type="checkbox"/> Improved site circulation	Constructability & Flexibility <input type="checkbox"/> Constructible design <input type="checkbox"/> Rigid construction methods <input type="checkbox"/> Flexibility for future expansion <input type="checkbox"/> Good technical performance <input type="checkbox"/> Simple, effective, & efficient Technology selection <input type="checkbox"/> Innovative approaches	Supply Chain Efficiency <input type="checkbox"/> Long term strategic partnerships with suppliers Legal and Contractual <input type="checkbox"/> Legal and regulatory aspects respected <input type="checkbox"/> Contractual provisions <input type="checkbox"/> Governance structure
Resource Efficiency <input type="checkbox"/> Productivity increase <input type="checkbox"/> Trained manpower; experienced, capable, and qualified personnel <input type="checkbox"/> Motivated human resources <input type="checkbox"/> Human resources development (ex: Leadership skills enhancement, improving team performance by practical measures) <input type="checkbox"/> Trustworthy team members	Time Considerations <input type="checkbox"/> Overall time respect <input type="checkbox"/> Proper forecasting of project schedule and progress <input type="checkbox"/> Proper sequencing of work and innovative approaches for shortening schedules <input type="checkbox"/> Payment terms (on-time payments, fast claim and payment approval, etc.)	Organizational Considerations <input type="checkbox"/> Transparency <input type="checkbox"/> Rework avoidance and reducing change orders <input type="checkbox"/> Long term viability and coordination/preservation of relationships / corporate image <input type="checkbox"/> Claims avoidance <input type="checkbox"/> Supporting innovation <input type="checkbox"/> No blame culture <input type="checkbox"/> Coordination and collaboration (sharing information)	Risk Assessment and Mitigation <input type="checkbox"/> Proper risk assessment and mitigation <input type="checkbox"/> Reducing clients' business uncertainties <input type="checkbox"/> Ability to cope with uncertainty	Process Quality <input type="checkbox"/> Align interests, objectives, and practices <input type="checkbox"/> Information sharing efficiency <input type="checkbox"/> Harmony between project stakeholders <input type="checkbox"/> Facilitating communication methods <input type="checkbox"/> Reduction of adversarial and dispute relationships <input type="checkbox"/> Increasing transparency <input type="checkbox"/> Producing quality drawings (error-free, clash-free, etc.)

Figure 2. Value Categories

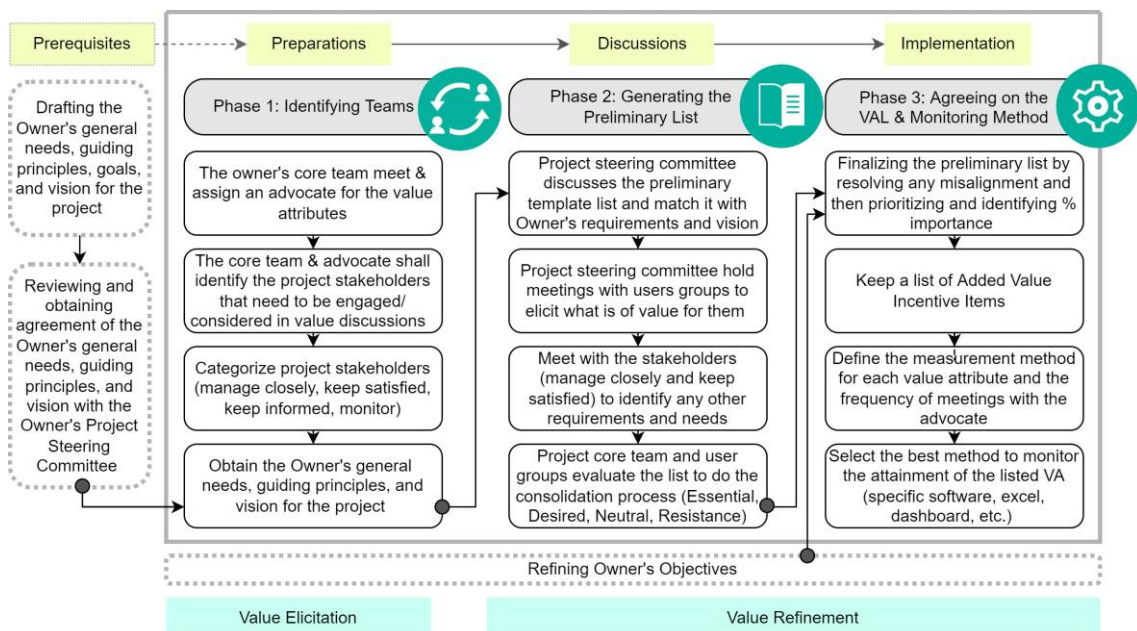


Figure 3. The process of developing Value Attributes List (VAL) and subsequent steps

After consolidating the list and soliciting stakeholders' views and input, phase 3 can commence. Note that during the different phases of this process, the Owner's objectives are being refined and revisited as more information from different parties are revealed. In phase 3, the preliminary list needs to be finalized by negotiating any identified resistance or misalignment between participants. Then, the team members should identify the % importance of the attributes. In addition, a list of Added Value Incentive Items should be shared with the team to include any item they deem good to include on the project if budget permits.

The last two steps in the implementation phase are (a) defining the measurement method and/or the evaluation criteria for each attribute (KPIs, leading and lagging indicators) plus the frequency of meetings to follow up on value attainment; and (b) selecting the best method to monitor it or the format for filling the evaluation, so specify a computer program or software that will be used (excel sheet, a dashboard, etc.).

ACTION TAKING, EVALUATING, & REFLECTIONS

PROJECT 1 - OBSERVING

Project 1 is the first of the two case studies employed for validating the proposed process. For this project, the authors used the observational research, where researchers observe participants in a natural situation. One of the authors started attending the Design Coordination & TVD weekly meetings, and the value alignment bi-weekly meetings. These meetings were hosted by one member of the Project Management team who is also one of the authors. The project is a public services facility and is performed under the Integrated Project Delivery contract. The Project steering committee met to develop the Owner's requirements and goals in 2019 and then the validation phase commenced in January 2020. The resulting validation report included the Basis of Design and indicated that the IPD team is committed to applying Lean principals and pushed for five key drivers: continue to generate value as seen from the Owner's perspective, focus on process and flow efficiency, look for and strive to remove waste, continuously improve as a team, and optimize the whole and not the parts. The contents of the report also included the regulatory requirements, Owner's requirements, goals and constraints, project values, and project cost (all under the Project Objectives).

Project values were described under 4 headings: General, Behaviour, KPIs, and Sustainability. The General category included operational excellence, resilient design, social responsibility, project satisfaction. 13 subheadings were described under the 4 headings apart from the items under sustainability. Every other week, the team would meet and evaluate one of the 13 listed value attributes. The values assessment includes pluses, deltas, and reflections pertaining to this specific value. *Mentimeter* is used, where each participant evaluates "how are we doing as a team in relation to this value attribute" and give a score out of 10. The team would be distributed into breakout rooms as meetings were held virtually during COVID. Each group discusses the plusses and deltas and write them down in the "Virtual Values Assessment Template" document. The team would come back to the main session, and one representative would summarize the discussions.

Observing these meetings and discussions had shown that it is important to keep track of how the team is doing on project values. These meetings reflect "*the IPD Team's 'commitment' to the project during regular intervals: are we doing what we said we would do?*". One observation is that participants need to be reminded of why they are doing this, in order to keep them motivated to participate and express their opinion.

Additionally, one concern remains about the actions taken after reporting the results to the Senior Management Team (SMT) at the monthly SMT/PMT Report-out meetings. For this reason, the guidelines highlighted the need for a value advocate to keep track of the needed improvements and take the necessary actions to address any shortcomings.

Finally, the project manager on this project, and based on his experience and involvement on this IPD project, suggested another categorization for the value families. It included 5 basic categories: (1) behaviour values, (2) budgetary values, (3) experiential, (4) operational, and (5) sustainability values. He also highlighted the importance of outlining good practices and guidelines that would help owners in developing the Project objectives (the prerequisites for the process explained in this paper).

PROJECT 2 - TESTING

Project 2 acted as an application for the proposed process to validate its applicability and suggest adjustments based on this experimentation. The project is an educational facility within a university that is seeking to have this building serve as a ‘crossroads for the university community’. A historic building is being renovated to accommodate new spaces and modern infrastructure, along with a newly constructed adjacent structure.

Two of the authors got on board with the project management office of the university. The topic of value delivery grabbed their attention. The research team and the project manager coordinated to produce the list of value attributes based on the: (1) key project drivers, (2) programming principles, and (3) Core & Shell (C&S) guiding principles. The participating research team delivered three presentations about the importance of value discussions and value delivery on projects, to the PM office, to the project steering committee, and to the Executive Oversight Committee EOC. This helped in getting buy-in from the whole team to support the process. The main incentive for this collaboration was seeking end-user satisfaction. The project management team is also looking for measurable ways for evaluating project success. While the project is not under the IPD contract, the team is striving for a collaborative approach and an IPD *spirit*.

The implementation process followed the same steps expressed in the process of Figure 3. Up until the drafting of this paper, phase 2 has been completed, while phase 3 is yet to be implemented. Figure 4 (a) shows that discussions around the generic list were performed to match the guiding principles and key project drivers. Figure 4 (b) shows the first evaluation of the value attributes related to “team behaviors” (scale out of 5).

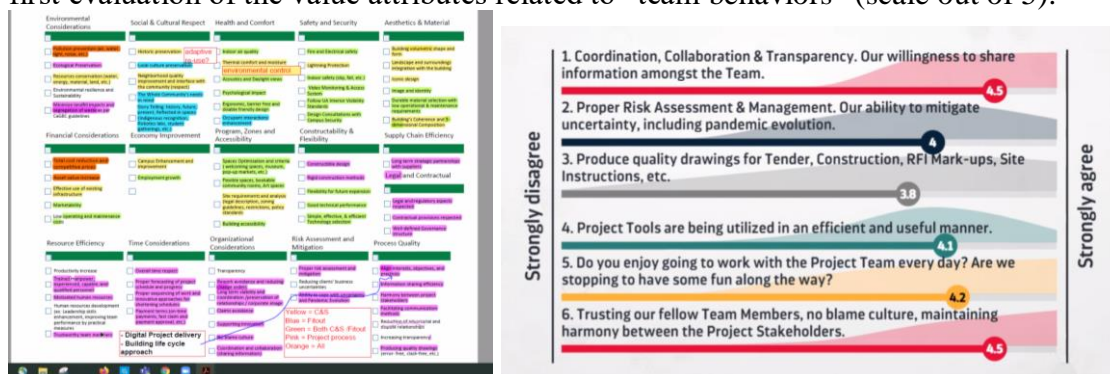


Figure 4. (a) Discussions with the PM based on the generic list and highlighting the attributes in connection with the educational facility; (b) first evaluation of the value attributes list under the team behaviour category (using *Mentimeter*)

The value discussions revealed some conflicting interests which reflected the need for further negotiations. Usually, when such cases surface, the team would be innovative in

their approach, and creativity would be higher leading to thinking outside-the-box. The project manager expressed some concerns over participants' actual review of the list, and their approval that it reflected their needs rather than being a pre-prepared list that fell as a 'parachute' on them. Other concerns were recorded regarding how to avoid subjectivity during evaluation. As indicated earlier, and based on those concerns, the authors recommended an advocate that would keep reminding the team about the importance of this exercises, keep them engaged to feel they are committed to this list, and agree on how to translate subjective matters into more objective targets and measures.

REFLECTIONS

We present in this section the general reflections about the process and lessons learned from the case studies. These are presented in the form of a set of recommendations for practitioners. The following steps are thus necessary:

- 1- Specify the network of people that need to be engaged at each stage (ex: when discussing the evaluation of *process* value attributes – transparency , team coordination, etc. – these are more related to the core design team not user groups).
- 2- Agree on the general categories upfront, the subheadings under each category could keep changing due to the dynamic nature of project values.
- 3- Ask the right questions to determine the benchmark (propose a set of questions)
- 4- Describe value attributes in a clear language and maybe identify glossary.
- 5- Identify how to translate these value attributes into design elements.
- 6- Keep track of contradicting value attributes and apply trade-off techniques such as CBA. Keep also track of any value losses (refer to studies in literature section). Report lessons learned.
- 7- Keep the team fully engaged. The team should know that this is not an additional burden/exercise to the project, it is part of the process for achieving success on projects similar to risk management, for instance. The team should also feel the ownership of the value attribute list, as they shall be part of the development process, or at least they should be given the chance to provide feedback on the list.

CONCLUSIONS

The need for a well-defined foundation for developing the value attributes list has been regularly asked for whenever the topic on value is raised in front of practitioners and scholars. In this paper, we presented a preliminary list to be the starting point for discussions on projects. The list needs to be revisited when coming across different types of projects and should be customized to meet the stakeholders' focus. While the list is not comprehensive in its whole, the authors argue that the headings are sufficient to raise the dialog needed for detailed specific subheadings. One of the reasons for not having an exhaustive ready-to-go list is the nature of value attributes being subjective and context specific. Nonetheless, this list can help novice practitioners looking for a starting point to launch discussions and guide the negotiations on value. The paper also outlined practices and guidelines to help develop the customized extended list and keep track of its implementation along the project design development and construction phases. Two case studies were presented, and discussions were made to benefit from their experience in implementing these practices. Future studies will tackle in depth the prerequisites and steps for helping owners develop their needs on complex projects. This paper adds one layer to the body of knowledge pertaining to delivering value on projects by highlighting the steps for developing a vital list of what is important to stakeholders on a project.

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