

ASSESSING SUITABILITY OF TARGET VALUE DESIGN ADOPTION FOR REAL ESTATE DEVELOPERS IN BRAZIL

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ABSTRACT

Target Value Design (TVD) has shown positive results on schedule, budget and products’ delivery with higher benefits for the owner. Familiarity with basic requirements of its elements and collaborative business practices have been hallmarks of successful TVD adoptions, particularly in healthcare. However, there has been little discussion about the TVD suitability for the real estate market so far, particularly when the project is driven by developers as opposed to users. Furthermore, the Brazilian real estate context poses some characteristics that could challenge the adoption of the TVD benchmark successfully. Therefore, the research puts forward the proposition that the adoption of the current TVD benchmark for developing products for sale in the Brazilian real estate sector poses some challenges and opportunities for strengthening TVD benefits in this environment. The aim of the research is to discuss about the adoption process of the TVD elements, in order to provide benefits for real estate developers in Brazil. The authors also intend to raise new research questions to better guide its future adoption in this situation. Evidence from an exploratory case study in Brazil is used to support the claim that the benefits already gained on traditional TVD situations, i.e. where clients build for their own use, seems to be insufficient alone to motivate Brazilian property developers to change from traditional practices. Initial assessment shows that, among other TVD benefits, developers acknowledge the improvements for their competitive advantages as the main one, as real estate companies are facing fierce competition currently in Brazil. The findings generate initial discussion about the suitability of the current TVD process benchmark in this context and derive directions for future research.

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KEYWORDS

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INTRODUCTION

The construction industry is a complex business in much of the world. Construction projects are challenging - with demands for schedule restrictions and cost reductions. Projects must adapt to numerous changes during the construction phase, and include urgent revisions, inconsistencies in construction sequencing, changes in scope, poor quality etc. (González et al. 2015).

Particularly in Brazil, construction projects are usually developed in an environment where budgetary restrictions and a fragmented and adversarial process of design are common. Traditionally, the design and construction phases of a project are completely sequential to one another and do not overlap. Collaborative practices are not common. On the other hand, Target Value Design (TVD) could be a strategic process to achieve more collaboration in the product development process, which adopts value perceived by the client, as well as cost restrictions, to drive the design process.

The literature reports cases in which TVD has been adopted successfully, promoting high collaborative environments and delivering products with higher added value. In the US, TVD has been used successfully with considerable benefits, such as to reduce costs and add value to the design and construction of health care facilities. TVD applications have increased cost certainty while meeting the owner's demand for increased value (Ballard and Reiser 2004; Macomber et al. 2007; Ballard 2011; Rybkowski et al. 2012; Zimina et al. 2012; Denerolle 2013; Do et al. 2014). Interestingly, the literature has already showed a successful TVD application in non-collaborative environments in the U.S. (Melo et al. 2015). However, to our knowledge there is no such successful TVD application in Brazil so far.

While TVD has been mostly implemented in the U.S. construction industry, particularly in healthcare and in energy efficiency retrofit projects (Lee 2012), the real estate market is a context still poorly explored. The suitability of TVD for the real estate market is still debatable, considering the fact that in this situation property developers drive the project as opposed to users. On the other hand, the benefits offered by the current TVD benchmark (Ballard 2011) include benefits sought by developers.

Particularly, the real estate context in Brazil poses some characteristics that could challenge the adoption of the current TVD benchmark. Some of the characteristics of the real estate context in Brazil are: (i) a highly adversarial and opportunistic behaviour among stakeholders, (ii) lack of awareness of the principles of the Integrated Project Delivery (IPD) (AIA 2007), (iii) a fragmented product and design process development, (iv) the time to launch new products in the market is too long (e.g. three times longer time completion in average than U.S.'s projects according to Mello and Amorim (2009)) and (v) the property developer drives the product development without a systematic process of determining the value proposition of end users. In general, the value proposition exercise is limited to define which product's features would be saleable.

Due to those characteristics of the Brazilian real estate context, the research put forward the proposition that pioneer adoptions of current TVD benchmark in this situation still poses some challenges and opportunities for strengthening TVD benefits. Therefore, the aim of the research is to discuss about the adoption process of the current TVD benchmark, in pursuance of providing benefits for real estate developers in Brazil. The authors also intend to raise new research questions to better guide its future adoption in this situation.

Evidence from an exploratory case study in Brazil is used to support the claim that the benefits of TVD in traditional situations, i.e., where clients build for their own use, are insufficient to motivate property developers to change from traditional practices. As any exploratory research, it poses some limitations. The most relevant one is its impact limitation, as it can suffer from the adopted regional focus approach.

TARGET COSTING (TC) AND TARGET VALUE DESIGN (TVD)

Target costing (TC) originated in the Japanese automotive industry in early 1960s as a cost reduction and value management strategy (Cooper and Slagmulder 1997; Liker 2004; Jacomit and Granja 2011). Traditional cost management practices establish a product's price by adding a profit markup to a product's design and production cost. By contrast, target costing works from the opposite direction. Considering his own business decision, whether or not to make this or that investment, the developer forecasts the revenues he will receive from sales (or rents) of the product at whatever price he expects to be able to get customers to pay, then subtracts his desired profit margin, and the remainder is the allowable cost—assuming ability to fund. (Equation 1) (Cooper and Slagmulder 1997; Liker 2004; Pennanen et al. 2008).

Target Cost = Target Price – Profit Margin (Equation 1)

If we consider this equation for the real estate sector, the target price is the sales price of the building to be constructed. Estimates of the developer's allowable cost to guarantee his profit margin is used to select characteristics of the building to be constructed.

A traditional pricing model is very different from target costing. In the traditional process, a product usually is defined by the marketing department and is then “thrown over the wall” to the engineering department, where technical specifications are set. When all work is concluded, process engineers execute final documents (Cooper and Slagmulder 1997).

Construction projects often suffer a similar fate; cost overruns and unsatisfactory customer value are common (Forbes and Ahmed 2011). TVD is a tool used by Lean Construction practitioners and is envisioned as a target costing adaptation for the construction industry (Macomber et al. 2007). TVD can profit from the early involvement of key stakeholders by the use of IPD processes. The TVD approach considers the construction industry as a complex system, including: (i) product definition, and (ii) design and construction stages. The goal is higher value-added delivery, using continuous improvement and waste reduction (Denerolle 2013). TVD research and practice have been carried out within the lean philosophy framework and rely on the benchmarking practices (Table 1).

It is important to mention that the way teams are traditionally organized is not always appropriate for TVD. TVD relies on IPD principles and they need to be considered in order for a TVD project to succeed. IPD is an integrated design process that engages the knowledge and expertise of each team member, seeking the best and most integrated design solutions (AIA 2007). In IPD, all the members involved with the project development work collaborate as a single team. This can be a challenge for some stakeholders (Zimina et al. 2012). Targets in TVD help avoid scope creep and compromising those elements, which the owner most values; issues commonly observed on traditionally delivered projects.

Table 1: TVD Benchmark (Adapted from Ballard, 2011)

Element	Description	Element	Description
1	With service providers, the customer develops and evaluates the project business case.	10	Team members discuss about the cost, schedule and quality implications of design alternatives.
2	The business case includes specification of an allowable cost. Financial constraints and limitations are specified.	11	Cost estimating and budgeting are done continuously through intimate collaboration.
3	The feasibility study involves all key members.	12	The Last Planner® system is used to coordinate the actions of team members
4	Feasibility is assessed through aligning ends, means and constraints	13	Targets are set as stretch goals to spur innovation.
5	The feasibility study produces a detailed budget and schedule aligned with scope and quality.	14	Target scope and cost are allocated to cross-functional TVD teams.
6	The customer is an active and permanent member of the project delivery team.	15	TVD teams update their cost estimates and basis of estimate (scope) frequently.
7	All team members understand the business case and stakeholder values.	16	The project cost estimate is updated frequently to reflect TVD team updates.
8	Some form of relational contract is used to align the interests	17	Co-location is strongly advised.
9	Cost and schedule targets cannot be exceeded, and only the customer can change target scope, quality, cost or schedule.		

RESEARCH METHOD

An exploratory single case study was adopted as a research method. The appropriateness of this method is related to theory development and expansion of the empirical field of knowledge (Yin 2010). Additionally, it could open new avenues for further research with a view to generalization.

The case described in this paper was carried out within a property developer in Brazil. The selected company develops properties for sale to upper- and middle-class households. The company has a set of 15 products classified into three categories: Family (entry, transition, and established), Commercial (offices, retail and companies headquarters) and Niche (second home and exclusive properties).

Interviews with property developer's staff were used as the main data collection tool. Company's documents related to product development were also analyzed as a triangulation approach, as a means to increase the validity of results (Yin 2001). The interviewees include two product developers (with 5 and 12 years of experience) and one lead architect. The interviews aimed to understand the product development process, and then to diagnose the developer in relation to which TVD elements were already implemented, even if in a non-systematic or unconscious way. The 17 elements of the current TVD process (Table 1) were used to assess the adoption of TVD elements. The status of the adoption of the 17 elements was classified as: (i) Not Applied; (ii) Not Systematic or Partial Application; (iii) Applied but Changes are Needed⁵ and (iv) Systematically Applied

Data analysis involved the development of a case study database, which included the interview transcripts and the documents collected during data gathering. Finally, a discussion on the appropriateness of the adoption of the TVD benchmark for the Brazilian real estate context is offered and new research questions are formulated. In this work, the research question is tightly scoped within the context of an existing theory, i.e. it relies on the TVD current benchmark and its already successful applications where clients build for their own use. The justification rests heavily on the ability of qualitative data to offer insight into complex social processes that quantitative data cannot easily reveal (Eisenhardt 2007).

EXPLORATORY CASE STUDY

There is a fierce competition in today's Brazilian real estate market, due to an economic situation where potential buyers are more selective and scarce, so supply is greater than demand. Besides, in that situation the property developer drives the product development, as opposed to users, who are the potential buyers of those products. Frequently, there is also little consideration about what constitutes the value proposition for them.

Evidence from non-structured interview with the product developer indicated that cost-cutting efforts were more common than trying to determine the value proposition for users or potential buyers. Therefore, there is little consideration on systematically determining what represents value for them (Oliva 2014). The value proposition of the potential buyer is mostly determined in relation to product's features that could be saleable. The final product consists of selling units, in which the time to launch to market is crucial, as the longer this period is, the greater the probability of loss of sales to competitors will be, and the greater the difficulty to reduce costs will be. Due to the real estate characteristics of intense competition between real estate market players, even considering the other benefits, the potential for improving their competitive advantages by adopting the TVD approach is among one of the most desirables.

⁵ In this case, although the principle is applied, its adoption occurs in a way that its benefits are not fully achieved according to the TVD theoretical framework.

The basic requirements of TVD elements and collaborative business practices are relatively new and are still not widely spread within the Brazilian construction industry. The following features describe the current scenario:

Highly fragmented design process development – the building company commonly outsources the design projects (architecture, MEP, structure, etc.) in a low collaborative work flow;

Time to launch new products in market is too long: up to 16-18 months. The company can lose potential buyers to the competition. A competitive advantage is, therefore, desired;

The property developer drives the product development. The end users’ perceptions of added value has little consideration in a new product development;

Main suppliers rarely participate in the product development process or they start their relationship in a later development design phase.

Figure 1 shows the current product development process of property developer A (Dev. A). It is a sequential, linear and highly fragmented process from land acquisition to launch. The product development process covers 2 cycles: Land acquisition and Real estate development. The cycle of land acquisition lasts for 4 to 6 months. The cycle of Real estate development (from design to launch) lasts for 12 to 18 months.

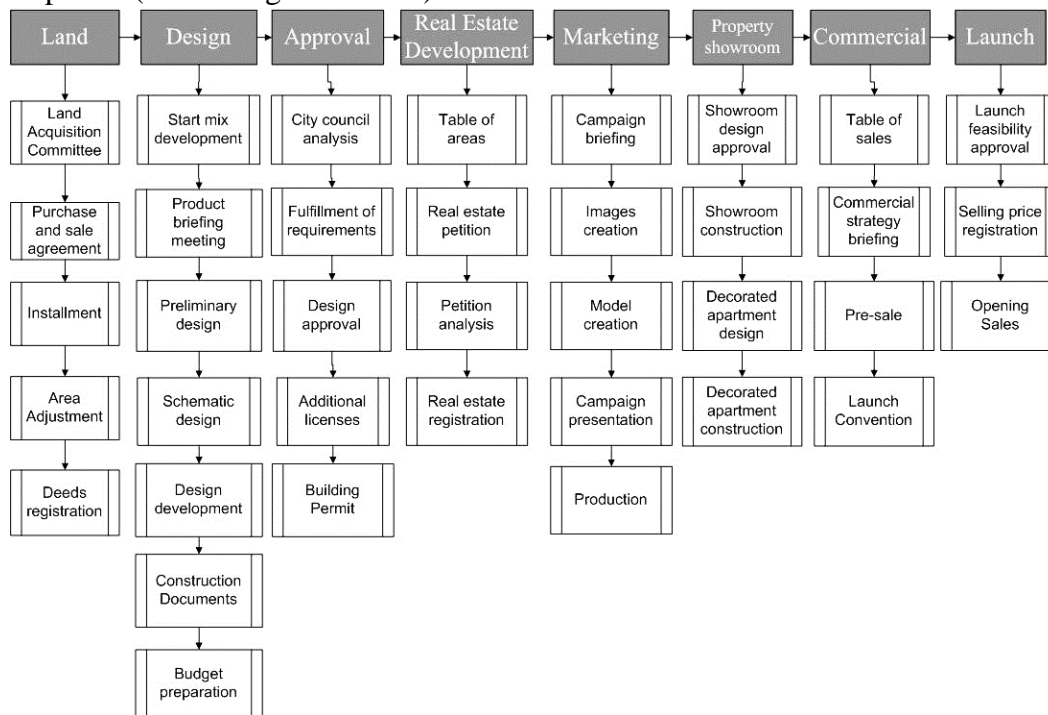


Figure 1: Product development process of Dev. A (Melo; 2015)

Figure 2 sums up the findings of the first stage data collection process, regarding how the TVD’s 17 elements (Table1) were classified in the product development process of the Dev. A i.e.: (i) Not Applied; (ii) Not Systematic or Partial Application; (iii) Applied but Changes are Needed and (iv) Systematically Applied.

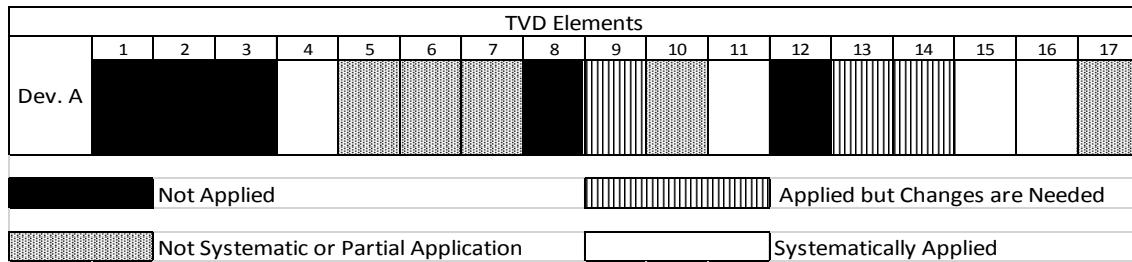


Figure 2: First stage data collection: TVD's 17 elements applied by Dev. A

TVD is influenced by IPD, which in turn depends on increasing levels of collaboration between the parties involved in the project in order to achieve its full potential. In consequence, in the second stage of the case study a TVD adoption based on evolutionary levels of collaboration was proposed (AIA 2007) (Table 2).

Table 2: Levels of Collaboration (AIA 2007)

Level of Collaboration	Main Characteristics
Level 3 – Required	Use of multiparty contracts, requiring participation of all agents involved in risk-sharing, joint decision-making and co-location for, providing a more collaborative environment.
Level 2 - Acquired	Use of some relational and incentive contracts in order to achieve higher collaboration levels. Better collaboration, incentives for better productivity, more active participation of the user, greater involvement in the decision-making
Level 1 – Typical	Collaboration is achieved in some levels without formal contract. Limited risk sharing and open-book policy

To better fit the real estate characteristics in Brazil, Oliva and Granja (2015) allocated TVD's 17 elements into the three collaboration levels defined by AIA (2007). Building Information Modelling (BIM) and the Last Planner System were considered as catalysts of the TVD adoption. They are important tools for achieving full benefits in a TVD adoption, accelerating the process, but they were not considered mandatory.

For the second phase, the participants were interviewed in order to understand the company's readiness to adopt TVD. According to their assessment, the elements were allocated into 3 levels of evolutive collaboration for the company (Figure 3). The 3 elements of TVD allocated on the Level 1 were regarded as easily implemented by the company's interviewees, according to its current product development practice. Level 2 and 3 "more challenging" TVD elements could be implemented over time as the process evolves into a full-fledged adoption of TVD.

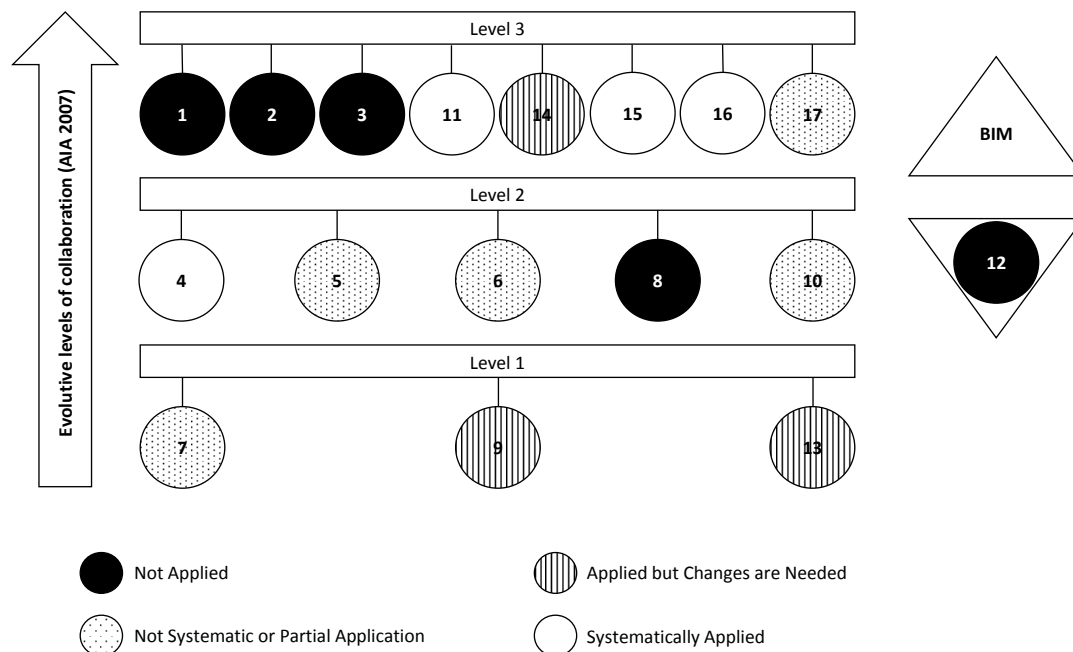


Figure 3: Allocation of the 17 TVD elements into 3 levels of evolutive collaboration (

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After analyzing the data and the particularities of design process development in Brazil, some discussions about and research questions for TVD adoption could be raised. In the case study, one of the interviewees stated that “*what is value is pushed upon the potential buyer*”, instead of being an input for design driven by those buyers. One of the interviewees said that “*the product’s attributes must be sellable*” - an evidence of the pushed value, when it would be more interesting if the potential client could pull the design process. Therefore, the question one can raise here is: “How to determine value proposition of potential buyers to steer the design process?” Kowaltowski and Granja (2011) have already adopted a value assessment approach by end users of social housing projects, using a set of cards with various items that could represent value for those users. Among other tools for assessing the value proposition, this approach could be adapted for the peculiarities of consumers of real estate units for sale.

Another issue raised by the case study is that the real estate product development in Brazil occurs in a non-collaborative, adversarial environment. There is a lack of IPD awareness of TVD related concepts, besides a very long product development process. One of the interviewees pointed out: “*it lasts 16-18 months from inception to launch to market, and this can often represent the loss of potential buyers for competitors*”. Therefore, one can address the following question: “How to promote more collaboration in a rather fragmented product development process, where IPD related concepts are still lacking?” Superior levels of the adoption the TVD elements in the Brazilian real estate sector could be reached according to the levels of collaboration posed in Figure 3. The rationale is flexible enough to address the current stage of collaboration of different companies and to begin an evolving adoption of the TVD elements.

CONCLUSIONS

This paper contributes to existing knowledge by discussing the adoption process of the current TVD process benchmark to the real estate market in Brazil and by deriving directions for future research. Departmentalized approaches or batch-and-queue product development identified in the selected developer might not be favourable to TVD implementation, due to its lack of integration. The current product development process often includes redesign activities and queues between departments, which could be a potential reason to convince developers to adopt TVD elements.

The method for the adoption of TVD elements progressively through the levels of collaboration (Figure 3) was not tested. The rationale behind it is flexible enough to address the current stage of collaboration of different real estate companies and to begin an evolving adoption of the TVD elements. Therefore, future research efforts could try to validate it and make adaptations for its use elsewhere, leading to generalizations.

The mindset of real estate property developers tends mainly to relate the TVD benefits to a potential approach to develop competitive advantage in a rather aggressive environment such as the real estate market. For this reason, revisiting TC's products' development original theory could bring additional insights for possible adaptations for TVD better suitability to this context. One such opportunity for strengthening the benefits of TVD adoption in Brazil could be adding targets for reducing time to market of products in this environment. Finally, TVD could also teach real estate developers to deliver products that arrive at a price that works for them as well as for their buyers.

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