

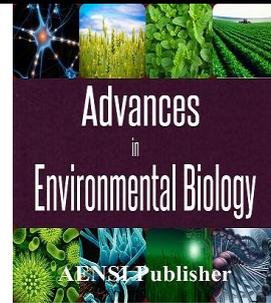


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Traditional Planning and Design versus Integrated Green Building Design: A Study on Design Team's Moving Approach

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ABSTRACT

Due to the experience of lofty percentage of iteration on material wastage in the construction industry, sequentially, moving approach by re-design (integrated green building design) the traditional planning and design process are needed. This is to reduce the negative impact towards the environment, and products will perform better whilst reducing destruction to the environment. The correlation of team member's background differences for project experience, knowledge and practice were used as variables in order to observe the impact on the design team's perceptions and factors of moving approach. This paper will shed some light (a) to investigate different perceptions among design teams during the design approach; traditional planning and design process versus integrated green building design approach, and (b) to determine key differences of traditional planning and design process to the integrated green building design approach.

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INTRODUCTION

“Our biggest challenge is implementing integrated design in daily practice. The traditional approach, where the Architect designs the building shape, orientation and envelope and then transmits the drawings to the mechanical and electrical engineers for their design, is a sequential approach that misses the rich opportunities for optimizing building performance through a collaborative approach throughout the design process. It is going to require a cultural shift in our industry to transform the design process, and it is a shift that has to occur if we are going to reach our goal of net-zero energy buildings” [1]. The Architectural, Engineering and Construction (AEC) industry experiences lofty percentage of iteration on material wastage compared to other design industries. Hence, the notion of buildings being as '*machines for living*' is undeniable as buildings take part in the destruction of the environment [2]. Good design should involve solving problems, creating something new or transforming less desirable situations to preferred situations. Consecutively, Parson's Theories of Social Action develops fundamental structures that consist moving approach from the primitive to the most advanced. This theory explains the pattern of integration, interpretation and understanding of design team's experience that leads to knowledge on involving the necessity to mobilize resources and organize ways for the attainment of specific goals [3,5]. Among the purpose of this paper are (a) to investigate different perceptions among design teams during the design approach; traditional planning and design process (TPDP) versus integrated green building design approach (IGBDA), and (b) to determine key differences of TPDP in moving towards the IGBDA.

Methodology:

A qualitative approach of focus group interviews/discussions was used to collect qualitative data. Samples were taken from 2 different types of design teams formed; traditional planning and design process versus integrated green building design approach, based on the differences of individual background, profession and project experience, such as Architects, Engineers and Consultants Groups. Different project experience, knowledge and practice affect the design team's perceptions and factors of moving approach. All the data obtained were transcribed, and the research findings were divided into three parts.

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RESULTS AND DISCUSSION

There are three key differences of moving approach from TPDP towards the IGBDA.

(i) Project Involvement and Decision Making:

TPDP has limited involvement of the project members to their own trade and specialization compared to the IGBDA as the project members are included right from the start of the project to draw inputs that will help to shape the design and planning processes [4]. The findings (Fig. 1) show how the focus group participants associate themselves compared with a different project design process approach. Majority of the participants pointed out mix elements that typically in the TPDP, decisions are made by few stakeholders such as the owner, architects and contractors, whereas for the IGBDA, decisions are made by the team via brainstorming sessions, research and interaction. Parson's describes this scenario as 'diffusion versus specificity', as this is the dilemma of defining the involvement of team members in pluralistic situations or specifically limited in scope and involvement that can occur during the moving approach, depends on the team members' private interests or obligate them to act in the interests of the group [5].

Sofia (Architect 1)	Raj (Engineer 1)	Ismi (Architect 2)	Jatt (Consultant 2)
It is not a one-off design session but a continuous process that consists of reviews, meetings and brainstorming until the best solutions, under the project circumstances, are identified"	"It is all about the saving energy demands nowadays. I know it sounds complicated but natural resources are getting low, therefore natural lighting, multiple spaces, air and water flows, all of these things need to be considered. The most important thing is how the design member teams organized it"	"Integrated design process takes longer time before taking any decision as there are many considerations and changing planning need to be done before it is implemented at site compared to the traditional way where decisions can be made easily without hesitate and adjustment can be made at the project site accordingly"	"In an integrated green building design, the selection of the design itself will impact the form, organization and major materials of the building. It is not like the conventional building as the design is based on the cost basis that the more saving you had, the more cost effective you would get. But for an integrated green building design, the energy savings are counted"

Fig. 1: Participant's Mixed Comments on Project Involvement and Decision Making.

(ii) Divergence Approach in Cost and Time:

An integrated green building cost is less than a conventional building. Despite that, the TPDP shows that the project gets more intensive as it progresses with less time and cost are spent at the early stage [6]. Diversely, the IGBDA shows that the project starts off intensively with time and cost to be spent on meetings and discussions as the design team's objective is to reduce up-front capital costs, as well as reduce long-term operation and maintenance costs by using highly efficient systems. In general, participants within the teams and across the teams have different perceptions about the cost and time approach.

Ismi:

"It is normal to work on the cost effectiveness in any project that you are doing. Yes, I do agree designing and implementing the conventional building save more cost compared to designing and implementing the integrated green building design" (Architect 2).

Taufiq:

"Although conventional building saves more cost at the designing stage, but during the implementation at site, almost 60% cost will be increased due to the changes of material and workforce. However, for the integrated green building design, although it is difficult to cope in the beginning, but by using systematically software that has been set up previously, it will reduce the hassle away" (Engineer 2).

Zaida:

"An integrated green building design shows more cost effectiveness in long-term operation and facilities maintenance compared to the conventional building as it shows more cost effectiveness during the implementation, but it does not seems almost zero for cost effectiveness in long-term operation and facilities maintenance" (Consultant 1).

Relevantly, by adopting Fig. 2 by Zimmerman, it seems to support the different perceptions by the focus group participants [7].

(iii) Differences of Process Approach:

It is evident from the study by The Centre for Sustainable Buildings and Construction which stated that the TPDP adopted linear process and system, as it is considered in isolation and often results in own designing or over-sizing design, whilst the IGBDA shows differences by adopting a whole system thinking, as the total

building performance is used to access on how each system affects one another in order to deliver the optimum design [8]. Participant's mixed comments is supported by Friedlander in Fig. 3, who stated that there are differences in terms of cost and time in TPDP and IGBDA [9].

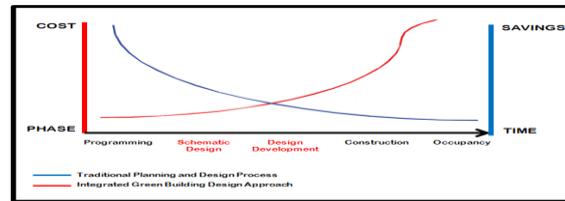


Fig. 2: Cost and Time: TPDP versus IGBDA.

Jatt:

"Moving from the conventional to the integrated green building design was not so easy, but it is not impossible to do it. What most important is the awareness and team's support" (Consultant 1).

Sofia:

"The system set up previously is those conventional building still can be used but what we are doing now is improvising it to be better, therefore the practice and project experiences do count and this is where the moving approach is applied" (Architect 1).

Taufiq:

"Hopping from the previous conventional design to the current integrated green building design was not the nature of what I had before, but that is why we have consultant to guide us and team member's meetings every day in order to move from the old way and habits" (Engineer 2).

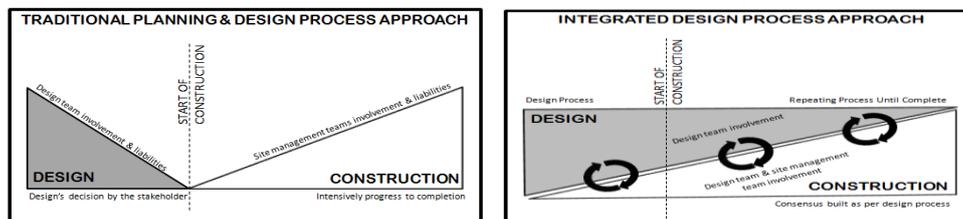


Fig. 3: Process Approach: TPDP versus IGBDA.

Summary

Findings show how focus group participants associate themselves with the ability to compare and discuss matters related to the traditional planning and design process versus the integrated green building design approach. It was evident that all participants in all focus groups were able to take part actively in the group discussions. The discussions on the Project Involvement and Decision Making showed that the majority of the participants during the discussions involved mix views and were able to clearly point out the differences of project involvement and decision making for both TPDP versus the IGBDA. For the questions related to the Divergence Approach in Cost and Time, the focus groups indicate that integrated green building cost is essentially less than a conventional building. Despite that, participants exhibited a proactive mindset initially taken from their own project experience, knowledge and practice, whereby moving from the TPDP to the IGBDA in fact reduces long-term operation and maintenance costs. As for the Differences of Process Approach, all focus groups had the tendency to discuss their difficulties in moving practice and system from the TPDP to the IGBDA. There is a correlation that affects the different meaning of perceptions and influence factors on the moving approach, depending on the team member's project experience, knowledge and practice.

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