J. Basic. Appl. Sci. Res., 5(12)30-34, 2015
© 2015, TextRoad Publication

ISSN 2090-4304
Journal of Basic and Applied Scientific Research
www.textroad.com

Variables Affecting the Quality of Story Building Design Document

Koespiadi

Doctoral programme of Civil Engineering, Tarumanagara University, Jakarta, Indonesia

Received: August 16, 2015
Accepted: November 4, 2015

ABSTRACT

The design phase is an important step in the process of construction projects, because the decisions made affect the continuity of the next construction phase. Decisions and commitments made during the design phase has a tremendous impact on the future financing. The design process is a manufacturing process design documents created by design consultants in accordance with the directions and requests the owner of the work, which is done by some experts to the agreed time limit. Quality-rise building design documents made by the consultant still has shortcomings such as the suitability of the field, the suitability of the technology, conformance to human resources, document consistency, appropriateness of the budget plan. This study was conducted to establish a causal relationship model of perception of respondents to variables that affect the quality of the design documents in order to obtain variables that affect the design documents.
KEYWORDS: Stage Design, quality design documents, Causality Relations, influential variable

INTRODUCTION

In the implementation on most of things design process can affect the quality of design documents, because they contain errors and ineffectiveness of the design documents. The occurrence of errors and inefficiencies due to a result of the accumulation of several factors has played a role. Complex nature of the design process, involving thousands of decisions, sometimes it lasts a long time, and the interdependence under highly uncertain environment. A number of experts involved, such as architects, civil, mechanical, electrical, and other field experts have educational backgrounds and different cultures. Influence on the outcome of the design phase of a construction project is technically and economically very important.

It is precisely in this stage, when the owner of the work ideas are implemented in the physical work of building, which refer to the results of design documents in the form of drawings, work plans and requirements, technical specifications and budget plans The purpose of this study is the identification of variables that affect the quality of the design documents story building in order to improve the performance of the multi-storey building design

The initial phase of this research by conducting selections in the previous journal or relevant literature that has the same purpose and scope of this research, followed by testing variables against expert opinion on the feasibility of the variables that will be used on causality. To get qualified for the questionnaire used in the poll respondents, then do the test item test, the reliability and validity of the questionnaire. The results of the questionnaire were used to obtain qualified opinions from respondents related to construct a model that was built.

MATERIALS AND METHODS

Results of this study was to determine the variables that affect the quality of the design documents to get a good design process that will produce a good quality design documents anyway..

Design Process and Scope of Design

The design process generally takes into account aspects of functionality, aesthetics and various other aspects which is usually the data obtained from the research, thought, discussion, and from the pre-existing design. Activities undertaken in designs ranging from conceptual design, preliminary design, detailed design and final design, where the goal of the design is a product design work plan and the conditions therein contained technical specifications, drawings plans and budget plans.

Design Work Plan

In order to effectively coordinate the design process, the design team leader should develop a work plan. The work plan should be developed during the remedial design proposal, each plan should include the scope of work, budget, and schedule to do the job. Plan design work became the basis for integrating the work to be

***Corresponding Author:** Koespiadi, Doctoral programme of Civil Engineering, Tarumanegara University, Jakarta, Indonesia. Email: koespiadi@narotama.ac.id

performed by a variety of different design disciplines. The plan also forms the basis for monitoring the scope, cost, and schedule design.

Managing Progress during the Design Process

There is a tendency for some design experts to make changes during design to please the client without regard to the impact of changes in the project cost and schedule. Such changes can be considered both as a design destination development; changes need to be accommodated in order to avoid deviation from the original purpose of the design. The owners and experts must be committed to the design and scope of the changes the changes that occur.

Project Team Meeting

The design is a creative process that involves various areas of expertise that decisions have a major impact on a project. Each design experts work affects the work of one or more other design experts. A difficult task facing related, to ensure compatibility of the design in general, the problem is how to bring all issues to all design experts. This can only be achieved with effective communication in team meetings regularly scheduled.

Document distribution

Process design requires the distribution of documents and timely information exchange. Generally, there is a sense of urgency among the team members to complete the work as quickly as possible. When information is not distributed efficiently, thus increasing the workload of all the people and cause delays in the work, productivity is not efficient, and pressure work situation.

Management Team

Effective teamwork is a key factor in the successful management of any project design process. Typically, team leader involved in three areas of responsibility: within the project team, between the team and the client, and between the team and other management of the organization's team leader. In certain circumstances a variety of situations often arise that can cause interference, conflicts, delays, and misunderstandings that can affect the performance of the team.

Component-Based Structural Equation Modelling /Variance

Component-based Structural Equation Modelling / variance oriented causality test models / theories for component-based predictive models, the goal is prediction Partial Least Square. Latent variable is defined as the sum of the indicator. Partial Least Square Algorithm is getting the best weight for each block estimate indicators of each latent variable. Results of component scores for each latent variable based on the estimated weight indicator that maximizes the variance explained for the dependent variable (latent, observed or both).

Variables That Influence On Quality Design Document

Variables that affect the quality of the design documents taken from several literature and research journals that have been made, including:

Apply sustainable design concepts to protect human health and the environment, which can have the greatest impact and cost effectiveness when applied from the beginning on the design and development process or product. Sustainable design independent variable (X7) with waste prevention indicators, design a safe, non-hazardous chemical synthesis, use of renewable materials, catalysts, Avoid chemical derivatives, Atom Economy, Nano materials, solvents and reaction Election safer, Increased efficiency of energy, degradation Planning, Analysis pollution prevention, prevention of occupational accidents [1]

Selection of the right of private companies by considering factors: 1. Financial, 2. Techniques, 3. Safety, health and environment, 4. Managerial, it is with a view to getting the results on the selection of private companies that have the ability to finish the job properly, according objectives of the project. Independent technical evaluation of design variables (X4) with indicators of personal qualifications and experience design, competence / capability and design experts sub-expert design, quantity, condition and ownership of equipment, standard designs, Age plan, Meeting the needs of design, Meeting the needs of clients, facilities and additional services beyond the client's needs, Aspects of structural, geotechnical and foundation aspects, electrical and mechanical systems, aesthetic and architectural aspects, management systems and quality assurance, quality control scheme design, construction methods and technology, Constructability, Maintainability, ease of maintenance, Potential value engineering, construction and ease of compliance Program, Scheduling materials, use of local materials and equipment, scheduling construction costs, insurance package for the construction, cost of technology acquisition, policy maintenance and implementation, maintenance scheduling implementation costs [2].

Decreased levels of design costs together with the time required for the design process has led to problems in the quality of the design documents, which in turn affects the efficiency of the construction process, On the other side of the research conducted by Andi and Minato, also revealed that the quality of the design documents are also affected by Individuals, organization and management, as well as the execution of the design process. The independent variable individual, organization and management (X2) with the effectiveness of the organizational structure indicators, pressure of time, coordination and communication between divisions, coordination and communication with the owner and contractor jobs, Consistency core member of the design team, leadership of the team leader, leadership of owner occupation , the level of agreement between the consultant planner, level of participation or the participation of all members of the design team, which handled the workload rate, availability of equipment / tools in the design process, the level of pressure in the working conditions, Conformity between planners consultants in the team, experience and knowledge of design and construction of owner occupation, level of interpersonal skills of owner occupation, level of interpersonal skills of experts design, accuracy and completeness of the information received by the consultant planner, accuracy and completeness of the information received by the owner of the work, timeliness of delivery of information from other planning consultants, Confidence among the design team, the motivation level of consultant planners, experience and knowledge of the design and construction of a planning consultant, construction knowledge in the field of design experts. Design aspects of the implementation of the independent variable (X3) with indicators of training science of design and construction of a new, regular design team Meeting, schedule design activities are well prepared and coordinated, Scopes design work complete and clearly defined, Opt contractor during the design, investigation of field conditions and constraints that exist as a whole, usage guidelines of the design process, gain approval and licensing to government regulations, activity-design activities are monitored and updated on a regular basis, all changes well documented design, all design changes are reported to the parties associated in the project, review the engineering calculations internally, codes, and regulations in any discipline of design, our review of completeness, accuracy, and clarity of the design documents, review the job externally by the owner or his representative, the reviews are externally by other consultants, implementation of constructability programs, use of information technology to improve communication and help transfer the project design document, Getting feedback on the quality of the design documents of the field, documenting the experience of past projects for use on projects that will come [3].

Emphasis to the importance of reducing waste and costs at the time efficiency of the design process, the factors that contribute to waste in the design of the main building is the management. Variable quality of design management (X5) with Openness indicator on customer needs, preferring to repeat business with satisfied customers, Increased profit margins associated with labour efficiency, greater certainty of the management process design, Fewer re-working the design to meet the needs of , controls are easy to do on the design process, Fulfilment targets for product design information, reduction of wastage, Definition of "quality" known by all members of the team, handling customer complaints seriously and analyse the main cause of the complaint, Defining responsibilities and targets for the production of images designers and design experts as well as sub-designs, Reduction of indemnity claims against insurance policies [4].

And integrative strategic management system that involves all managers and employees, as well as using qualitative and quantitative methods, to improve processes continuously organizational processes, in order to meet even exceed the needs, wants and expectations of customers. Variable total of quality service (X6) with response indicator of commitment, product improvement, process improvement, human resource capabilities, response to customer-oriented, economical excellence [5]

.

Quality of care is difficult to measure, so it is used to measure the perceptions of service quality results from a comparison of consumer expectations with actual service performance, service quality evaluations are not made solely on the results of the service, but it involves a process to serve customers. Variable customer service at (X1) with a minimum project duration indicator, deadline, Completeness, hospitality and courtesy, consistency and relevance, accessibility and convenience, accuracy, Responsiveness, Communication, Understanding customers. For the dependent variable quality of the design documents (Y) with indicators of completeness, clarity, consistency, accuracy, standardization, relevance, timeliness, coordination, certainty, confirmation, representative, life cycle cost, material efficiency, economy, relevance, constructability and Safety, Innovation , expressive, aesthetic, ecological soundness considerations, Compatibility field, choice of material, functional [6].

RESULTS AND DISCUSSION

In the early stages of this study to verify the variables that affect the quality of the designs that have been obtained from some of the literature and research journal by a team of experts, the Delphi method, the results of the verification, all the experts agreed that the variables used in the model of causality is appropriate.

Furthermore, test items, test reliability and validity test on a questionnaire that will be used to ask the opinion of the respondents, the results of this test with 31 respondents, resulting in that the questionnaire used is feasible and can be used for further research.

Table 1 Test Results Value Line Variable Coefficient t Statistic

Latent variables	Path coefficient	t-Statistic	information
X1 → Y	0.604	13.619	Significant
X2 → Y	0.317	5.678	Significant
X3 → Y	-0.057	1.282	not Significant
X4 → Y	0.144	0.920	not Significant
X5 → Y	0.053	0.788	not Significant
X6 → Y	0.068	2.335	Significant
X7 → Y	-0.051	0.901	not Significant

As a follow up of the t test statistic path coefficients of variables that affect the dependent variable quality of the design documents (Y) is a customer-service variable (X1), the variable aspects of individual, organization and management (X2) and total quality service variable (X6), where the variable has formative indicators are indicators that have an influence on Constructs models, to determine the level of significance of each indicator then tested loading factor value of t-statistics of each indicator, if the value of t> 1.96 then the indicator has a stated influence significant to the variable, and indirectly influence the dependent variable to the quality of the design documents (Y). Factor loading indicator test results for each significant variable can be seen in Table 2 below.

Table 2 Testing Value Factor Loading t Statistic Indicator Variables

Variables	Indicator	Value Factor Loading	t-Statistic	Information
X1. Customer Focus	X1.1. duration of the project	0.110	3.659	Significant
	X1.2. time limit	0.259	9.453	Significant
	X1.3. completeness	0.124	3.643	Significant
	X1.4. Friendliness and courtesy	0.140	2.167	Significant
	X1.5. Consistency and linkages	0.113	2.706	Significant
	X1.6. Accessibility and convenience	0.090	2.322	Significant
	X1.7. accuracy	0.214	6.522	Significant
	X1.8. The ability to respond	0.126	3.215	Significant
	X1.9. communication	0.230	5.764	Significant
	X1.10. understanding customer	0.152	3.917	Significant
X2. Aspects of Individual, Organization and Management	X2.1. Effectiveness of organization structure	0.142	3.837	Significant
	X2.2. pressure time	0.228	5.274	Significant
	X2.3. Coordination and communication between parts	0.205	5.300	Significant
	X2.5. The consistency of the core members of the design team	0.162	4.025	Significant
	X2.8. The level of agreement between the consultant planner	0.220	4.511	Significant
	X2.11. availability of equipment	0.247	6.926	Significant
	X2.12. Pressure level in working condition	0.155	4.817	Significant
	X2.13. Conformity between planners consultants in the team	0.307	4.986	Significant
	X2.14. Experience and knowledge of the design and construction of owner occupation	0.173	4.377	Significant
	X2.16. The level of interpersonal skills of planners	0.188	3.959	Significant
	X2.17. The accuracy and completeness of information received consultant	0.108	3.694	Significant
	X2.23. Construction of knowledge in the field of planning	0.200	4.080	Significant
X6. Total Quality Service	X6.1. response commitment	0.532	6.091	Significant
	X6.2. repair products	0.431	3.704	Significant
	X6.6. economic superiority	0.281	2.943	Significant

Analysis of the effect of variable contribution or percentage of variance analysis between variables Effect of variables X1, X2, X3, X4, X5, X6, X7 to variable Y is equal to 88.0%.

CONCLUSION

Variables that affect the quality of the design documents are:

a. Variables on customer service which consists of indicators: minimum project duration, deadline, completeness, friendliness and courtesy, consistency and relevance, accessibility and convenience, accuracy, ability to respond, communication, understanding the customer.
b. Variable individual, organization, and management consists of indicators: the effectiveness of the organizational structure, the pressure of time, coordination and communication between divisions, the consistency of the core members of the design team, the level of understanding between the consultant planner, availability of equipment, working conditions in the pressure level, the suitability between the consultant planner in a team, experience and knowledge of the design and construction of owner occupation, level of interpersonal skills of planners, the accuracy and completeness of information received by consultants, construction of knowledge in the field of planners.
c. Variable total quality service that consists of indicators: response commitment, product improvements, economic advantages.
d. While the indicator variables have a significant effect on the quality of the design documents, are: completeness, clarity, standardization, the relevance of the specification, coordination, life cycle cost, material efficiency, economy, the relevance of design, constructability and safety.

REFERENCES

1. Vallero, D., and Brasier, C., 2008. *The science of sustainability and green engineering*, John Wiley and Sons, Inc.
2. Zhang, X.Q., 2005. Criteria for Selecting the Private-Sector Partner in Public-Private Partnerships, *Journal of Construction Engineering and Management,* Vol. 131, No. 6, june 1, 2005
3. Andi and Minato T., 2003. Design Documents Quality in The Japanese Constructions Industry: Factors Influencing And Impacts On Construction Process. *International journal of Project Management;* 21:237-246
4. Rounce, G., 1998. Quality, Waste And Cost Considerations In Architectural Building Design Management, *International Journal of Project Management* Vol. 16, No.2, pp. 123-127,1998
5. Stamatis, D. H. 1996. *Total Quality service*: Principles, Practices and Implementation. Singapore: SSMB Publishing Division.
6. Parasuraman, A., Zeithaml, V.A., and Berry, L.L., 1985. A Conceptual Model Of Service Quality And Its Implications For Future Research. *Journal Of Marketing,* 49, 41-50