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Analysis Variable of Change Orders Building Projects (Study Case Building Project in Jakarta)

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ABSTRACT: Improvement of work (changing the order) often occurs in the implementation of the project both at the beginning, middle, and at the end of the project implementation. The change in order is to improve the performance of the process with the aim of improving work outcomes tailored to the needs of employees. Although the goal is to improve work, changing this sequence can result in several jobs and project costs during the construction process. From the results of several studies in Indonesia, changes in order can result in costs (Research of Dhulqarnain 2017) even up to 29% (Research Ari Sandyavitri 2008). The big order change factor is from design and design. The objects to be studied are several building projects that were carried out by PT. X in Jakarta. Because it chose high-rise buildings in Jakarta, Indonesia was among the highest among other countries, ahead of the Philippines, Qatar, Malaysia, Singapore, Thailand, the United Arab Emirates, and Australia according to the 2016 Urban High Building and Habitat Council (CTBUH) data okezone.com January 19, 2017. While PT. X is a building contractor that has gone public and is listed on the IDX since 2006. Having experience and competence in the construction of more than 800 buildings in Indonesia for more than 40 years. The problem of this study aims to examine the notion of change order, examine the notion of the performance of the construction process and examine the factors and change order variables that affect building projects. This study will examine various references and relevant research results, including: theory of change order, construction process performance, influencing factors and variables, theories about parties in the construction industry, portrait studies of buildings in Indonesia, theories about project performance, and various relevant research results in the past 10 years. The research methodology used is: Issue study, identification of research problems, literature review, analysis and discussion. The method used in this research is qualitative method. The results of this study are expected to be concluded regarding the definition of change order, construction process performance, factors and change order variables in building projects as well as the effect of change orders in improving the construction process performance. The results obtained are expected to be an input for construction people to be able to improve the construction process in the future. The purpose of the results of this study is expected to complement and refine the results of previous research.

KEYWORDS: Construction process, change order, building project.

I. INTRODUCTION

Image inpainting is a method for repairing damaged pictures or removing unnecessary elements from pictures. It recovers the missing or corrupted parts of an image so that the reconstructed image looks natural. In real world, many people need a system to recover damaged photographs, designs, drawings, artworks etc. damage may be due to various reasons like scratches, overlaid text or graphics etc.

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This system could enhance and return a good looking photograph using a technique called image inpainting. Image inpainting modify and fill the missing area in an image in an undetectable way, by an observer not familiar with the original image. The technique can be used to reconstruct image damage due to dirt, scratches, overlaid text etc.

Some images contain mixed text-picture-graphic regions in which text characters are printed in an image. Detecting and recognizing these characters can be very important, and removing these is important in the context of removing indirect advertisements, and for aesthetic reasons. There are many applications of image inpainting ranging from restoration of photographs, films, removal of occlusions such as text, subtitle, logos, stamps, scratches, red eye removal etc.

The concept of image inpainting was first introduced by Bertamio et al. [1]. The method was inspired by the real inpainting process of artists. The image smoothness information interpolated by the image Laplacian is propagated along the isophotes directions, which are estimated by the gradient of the image rotated by 90 degrees. Exemplar Based method proposed by Criminisi et al. [2] used a best exemplar patch to propagate target patch including missing pixels. This technique uses an approach which combines structure propagation with texture synthesis and hence produced very good results. In [3], the authors decompose the image into sum of two functions and then reconstruct each function separately with structure and texture filling-in algorithms. Morphological technique is used to extract text from the images presented in [4]. In [5], the inpainting technique is combined with the techniques of finding text in images and a simple algorithm that links them. The technique is insensitive to noise, skew and text orientation. The authors in [6] have applied the CCL (connected component labelling) to detect the text and fast marching algorithm is used for Inpainting.

The work in this paper is divided in two stages. 1) Text- Detection 2) Inpainting. Text detection is done by applying morphological open-close and close-open filters and combines the images. Thereafter, gradient is applied to detect the edges followed by thresholding and morphological dilation, erosion operation. Then, connected component labelling is performed to label each object separately. Finally, the set of selection criteria is applied to filter out non text regions. After text detection, text inpainting is accomplished by using exemplar based Inpainting algorithm. Paper is organized as follows. Section II describes automatic text detection using morphological operations, connected component analysis and set of selection or rejection criteria. The flow diagram represents the step of the algorithm. After detection of text, how text region is filled using an Inpainting technique that is given in Section III. Section IV presents experimental results showing results of images tested. Finally, Section V presents conclusion.

II. LITERATURE REFERENCE

According to the AIA (American Institute of Architects) change order is a written request signed by the architect, contractor, and owner that is made after the contract is issued, which has the power to change the scope of work or make adjustments to the contract value and time of completion of work (Nurlaela, Mandagi 2013). Change order is an official document signed by the owner and contractor to compensate the contractor for changes, additional work, delays, or other consequences of the collective agreement written in the contract (Barrie 1995). Change order is a proposal for changes in writing between the owner and contractor to change some conditions from the initial contract document, such as adding, reducing work, this change can change the specifications of contract costs and payment schedules, project schedules. Change orders can occur at any time starting from the beginning, mid, until the end of the construction work, and can occur in all construction projects (Gumolili Sandy A et al 2014). Change order can be defined as an agreement between project owners and contractors to revise work in accordance with field conditions (Maulana Aceng 2016). A Contract Change Order on a construction project is an event in which a contract with a work that has been designed changes because there are differences with the conditions on the field where the change is agreed upon by the work owner and the supplier of goods / services. This Contract Change Order includes: increasing or decreasing the volume of work listed in the contract, adding and / or reducing the type of work, changing the technical specifications of the work according to field requirements or changing the schedule of implementation (Fakhrizal et al 2013). Change order is a written change between the owner and contractor to change the condition of the initial contract document, by adding or reducing work. This change can change the contract costs and project implementation schedule. Briefly change order can be defined as a modification of the original contract. Change order is

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a letter of agreement in the form of a written agreement signed between the owner and the contractor after agreeing to confirm the changes and the amount of compensation for costs and implementation time to the contractor that occurred at the project implementation stage, after the signing of the employment contract between the owner and contractor. Change order types can be grouped into Direct change and Construction change. Direct change is a change that is submitted in written form, which is proposed by the contractor to the owner to change the scope of work, time of implementation, costs or other things that are different from those specified in the contract document. These provisions usually provide unilateral freedom to the owner to change the scope of work and require contractors to follow these changes. Formal changes are generally known before work is done. Constructive Change is an informal action to order a contract modification in the field that occurs due to the request of the owner, planner or contractor. Construction change is also explained as a change agreement between owner and contractor in cost and time. Changes in construction are often the main cause of disputes between owners and contractors due to the implementation of work outside of contract documents (Sapulette Willem 2009). According to the Indonesian arbitration newsletter BANI - vol. 8, 2016 concludes that each variation can be in the form of: 1) Changes to the quantity of work 2) Changes to the quality and characteristics of work 3) Changes in height or position and or size of work 4) Elimination of work 5) Changes in the sequence and timing of work. Project performance is a series of activities that are measured in the output process. Performance is said to be higher if the increase in output is higher than the addition of resources as an input factor and can be said as a dimension of productivity (Peter F. Kaming et al 2010). According to Mila Faila, 2012. The success of a project's performance can be seen from the achievement that is in accordance with the wishes of the assignor. This can be evaluated from the indicators of cost, quality and time performance while prioritizing Safety, Safety, Occupational Health and the Environment (K4L). Project is an activity that has goals and objectives, has transient traits, clearly when it starts or finishes, aims at achieving quality and time costs that have been determined, are unique and not recurring (Irika, Lenggogeni 2013). The word "Construction" can be defined as the order / arrangement of the elements of a building that positions each part according to its function. Speaking of construction, what is imagined is multi-storey buildings, bridges, dams, dams, highways, irrigation buildings, airports and others (Hafnidar.A Rani 2016). According to (AbrarHusen, 2011) the parties involved in the construction industry include: 1) The project owner is a person or company that has funds, assigns tasks to someone or company that has expertise and experience in carrying out work so that the project results are on target and set goals. 2) Planning consultant is a person or company that has expertise and experience in planning construction projects, such as Architecture Planners, Structural Planners, Mechanical and Electrical Planners, and so on. 3) A construction management consultant is a company that represents the owner in managing the project, from the beginning to the end of the project. 4) Contractor is a company selected and approved to carry out planned construction work in accordance with the wishes of the project owner and fully responsible for the physical construction of the project. 5) The contractor specialist is the party appointed to do some work that has special expertise / specialists. 6) Supplier is the party appointed to supply material according to the specified specifications. According to DKI Jakarta Provincial Regulation No. 7 Th 2010 Regarding Building, building is a physical form of the results of a construction work that is integrated with its place of domicile, partially or wholly above and / or in land and / or water, which functions as a place for human activities, whether for residential or residence, religious activities, business activities, social activities, culture, and special activities. Project is an activity that has goals and objectives, has transient traits, clearly when it starts or finishes, aims at achieving quality and time costs that have been determined, are unique and not recurring (Irika, Lenggogeni 2013).

III. RESULT AND DISCUSSION

From a review of several literatures, here the author examines from 14 journals published over the past 10 years that relate to change orders that occur during the construction process. From the study, the definition of change order during the construction process is any changes that occur during the construction process that have an impact on overall project performance. While the success of a project's performance can be seen from the achievement that is in accordance with the wishes of the assignor. This can be evaluated from the indicators of cost performance, quality and time while still prioritizing Security, Occupational Health and Environment (K4L).

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It can be seen that the change order factor that occurs, among others, comes from the project owner, consultant, contractor and external factors. The dominant variable of the project owner is the improvement of design, discussed in 6 research journals. Design improvements arise, among others, because of the desire of project owners to improve work results, adjust market conditions and keep up with technological developments. In addition to design improvements, the performance of project owners is discussed in 6 research journals. In giving a decision influencing the implementation schedule, this can occur because the experience and quality of human resources who are less skilled are also lack of knowledge in construction management which can lead to overall project delays. From the dominant variable planner consultant is the improvement of design, discussed in 7 research journals. Design improvements occur, among others, due to incomplete field conditions at the planning stage, so that when the design construction phase cannot be fully applied. Lack of coordination and communication during the planning stage is also the cause of design improvements for adjustments to other disciplines. From the dominant variable contractor is the work method discussed in 6 research journals is the dominant variable, because the improvement of the work method will be done by the contractor to improve the performance of both quality, cost and time. In addition, resource performance variables are discussed in 3 research journals, because not all of the resources involved have the same competency standards that can affect the quality of work that results in improvement. For the dominant external variables are natural disasters discussed in 8 research journals, natural disasters can result in damage to building construction so that repairs or redevelopments must be carried out. In addition to natural disasters, government policies are discussed in 6 research journals. Government policy in this case changes in regulations and permits. Also the increase in material prices discussed in 6 research journals, the increase in material prices that do not match estimates can lead to changes in specifications so that the project can run in accordance with the set completion targets.

IV. CONCLUSION

Based on the discussion of some previous research results, it can be concluded that:

- Understanding change order is a change or improvement of the initial contract.
- Construction process performance is every stage of activities carried out towards the construction target which has been determined by the assignor in the building project in Jakarta.
- Change order factor is the project owner, contractor, planner and external consultant. Reviewed of the highest number of variables are project owners with 28 variables, contractors with 13 variable, 9 variable planning consultants and 9 variables external factors.
- Effect of change orders in improving construction process performance, with improvements carried out by project owners, contractors, planner and external consultants.

V. SUGGESTION

Suggestions for improvement for the project implementation process in the future are:

- Understanding of the contract, by understanding the contract of the parties involved in the process the construction will be more careful, the mismatches of targets already stated in the contract and the parties will improve communication to separate.
- Process performance can be further enhanced by increasing human resources at work which allows each party that has expertise in accordance with their fields.
- Arranging a project must be able to determine the objectives of the results of the implementation right before the construction work begins, the result is the process during construction.
- Positive change buttons, especially in improvements that allow the creation of lessons that can be made for future projects.

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Vol. 7, Issue 11, November 2018

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