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Integrated Project Delivery (IPD) in Malaysian Construction Industry Dealing With Waste Issue

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ABSTRACT

The Malaysian construction industry is a significant contributor to the nation's economy, due to rapid development of infrastructures in Malaysia. However, there are still issues with the aspects of procurement and management within the construction industry in Malaysia, that can be improved to be more efficient and more cost saving. At present, the wastage from construction industry is drowning billions of Ringgit into nothing. This paper will look into the physical and non physical wastage from construction projects. The waste that can be avoided with a good management system such as value management (VM), concurrent engineering (CE) and integrated project delivery (IPD) will also be discussed in this paper. Accordingly, this paper highlights how IPD can be a platform for cost saving and reducing the waste in the construction industry, by considering each the characteristic of IPD as a system within the construction process. This paper concludes with highlighting how IPD principles can be adapted in current construction processes to reduce waste and improve the project team efficiency.

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INTRODUCTION

The construction industry in Malaysia is currently facing many challenges, mostly related to the process inefficiency and cost ineffectiveness. This could be due to the traditional construction process that being condemned by many scholars with numerous problems and issues. The traditional construction process comprises of the tendering process, designing, constructing and handing over the of the building to the end users. In between these processes, there are some barriers that are decreasing the efficiency of the project. The inefficiency in the project can cause the waste problem in the construction. Waste in construction can be defined as the any incident of the material loses and execution of unnecessary work, which generate additional cost no value added to the product [1]. In this paper waste can be defined as the inefficiency of the construction processes, including the usage of material, time, labour and equipment. To be more precise, waste is the expenditure of effort of the using-up of the resource without any value [2]. Waste can be divided into two categories; unavoidable waste (waste by nature), and avoidable waste (waste by human) [3]. Construction waste can be categorized into two clusters; physical waste and non-physical waste [4].

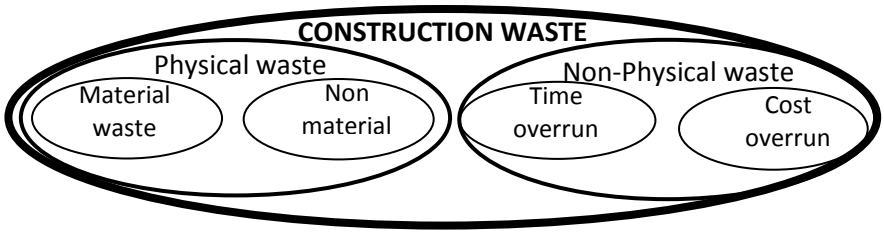

Fig. 1: Classification of Construction waste [4]

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Figure 1 shows the category of construction waste, this paper will discuss how IPD can generally reduce both of the physical and non-physical wastes in the construction in the following section.

Issues:

Waste can be generated in many ways. In general, there are three types of waste in construction projects; material waste, time overrun and cost overrun [5]. All in all of these three factors will lead to profit losses in the project. That being said, these wastes can mostly be reduced or can be reused in the same project or in another project. IPD could solve most of this issue by implementing nine IPD principals in the construction projects. The American Institute of Architects of California Council line up the nine principles of IPD [6]

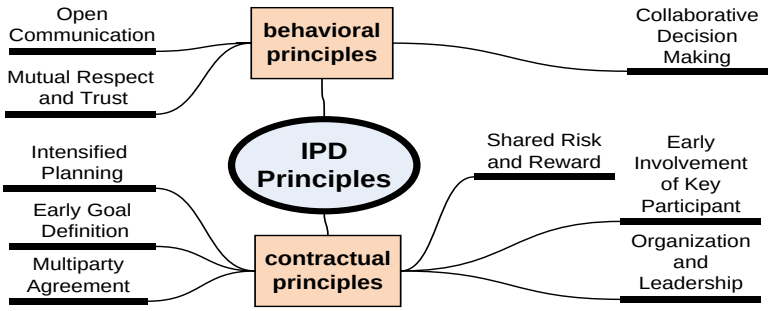

Fig. 2: Nine IPD Principles [6]

Method:

Based on a literature study, this paper will discuss the nine IPD principles to overcome the problems in construction generally focusing on how IPD can reduce waste, where IPD can minimize the cost and maximizing the value of the construction. This IPD will eliminate the barriers in between the people in the construction project.

Discussion:

It is only logical that the bigger construction project creates more waste, and this waste will create more losses in terms of cost, time and other physical waste. In some developed countries in Africa, it is estimated that 40% of construction waste is from rework, 30 to 40% labour and 20 to 25% waste from materials [7]. In Hong Kong, 5 to 10% of building materials will end up as waste [8]. In many countries, waste factor contributes to increasing wasteland congestion and most of the waste will not easily degrade in a short term. Figure 3 shows a classification of waste in construction projects.

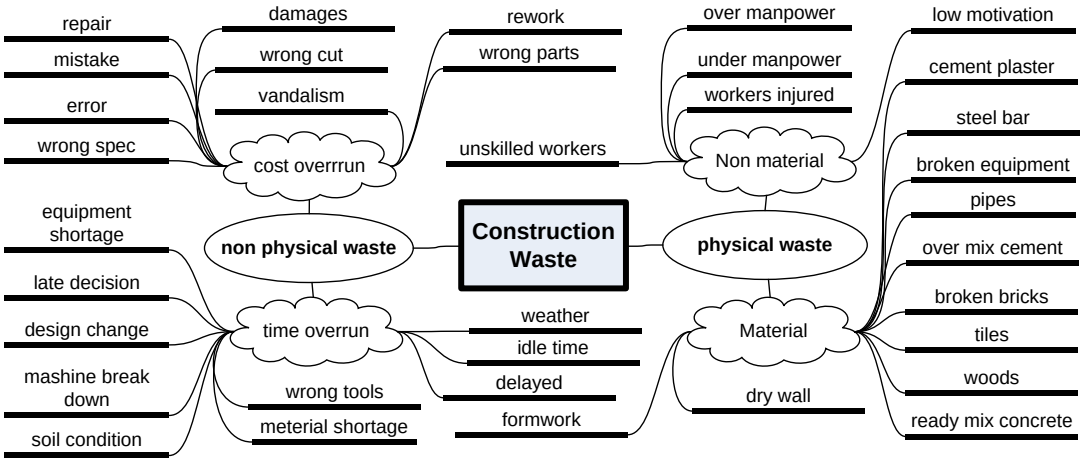

Fig. 3: Type of waste

According to AIA (2012), the use of IPD in a construction project is capable of reducing waste. The nine IPD principles serve as a guideline in ways that the construction team can interact in order to reduce onstruction

wastes. Table 1 below indicates how the IPD principles can be assimilated into current construction processes that lead to project efficiency and minimizing waste.

Table 1: The effects of IPD Principles in Construction Processes [9], [10]

IPD Principles	Effect to the construction	Reduce/ Avoid
Open communication	Communication flow without barriers, everybody can talk to anyone and get the information	Reduce misunderstanding and wrong timing
Mutual respect	Each party in the construction project understands and respect each other's capability and inability	Avoid delays, problem, mistake, wrong specification
Collaborative decision making	All decisions made by everyone in the early stage of planning about every part of construction	Reduce inaccurate specifications,, design, material and design changing
Intensified planning	Everybody aware and ready to face the problem that might happen, supply arrives on time	Idle time reduce, reduce shortage of material, equipment and labour
Early goal definition	Goal been set in early planning, everyone knows what and when to start their job on time	Avoid delay, rework, idle time and other mistake
Multi party agreement	Each party in the team agreed to take responsibility in the construction project punctuality timing and job to be done	Reduce misunderstanding, wrong job specification,
Shared risk and reward	Everyone responsible to any problem in construction and earn reward for the success	Reduce mistake, wrong tools and equipment
Early involvement of key participant	Key participants involve in the project planning process and plan the action	Reduce wrong timing, delay, overuse or under use of manpower and shortage
Organization and leadership	The construction process more organized lead by champion (construction manager)	Reduce item loss, late decision, equipment shortage

From Table 1, it can be seen that by applying the principles of IPD, the interaction of the construction team within the project can lead to reducing the physical and non-physical waste during the construction process. Therefore, the value and efficiency of construction processes can be maximized, as well as reducing the adverse relational problems that is often mentioned in the construction industry in the long run.

Summary:

IPD must be followed through with discipline and punctuality of every party in the construction team or otherwise the system will fail to achieve the promising targets. Integrated project delivery must be initiated in the early phases of project planning, way before the drawings are confirmed for the project. With commitment from owners, architects, engineers, contractors, subcontractors, suppliers and financiers, and continuous effort to IPD from the planning phase to the closing phase, efficiency and cost effectiveness in construction projects will be achieved which leads to minimization in construction wastes.

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