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Intelligent Green Buildings Project Scope Definition Using Project Definition Rating Index (PDRI)

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Abstract

The development of the intelligent green building project (IGBP) is the pursuit of a business strategy of an enterprise in principle and the launch of the project in practice. For the effective attainment of the desired goal, the IGBP is integrated with the knowledge of construction project management and the application of the Project Definition Rating Index (PDRI) in order to combine the needs of pre-project planning. These are the steps to enhance the performance of project execution, make buildings energy efficient and reduce carbon emissions. The IGBP-PDRI model proposed to construct in this study is based on the life cycle of the engineering to set up different phases of work for process evaluation. The objective of each phase is subject to the work breakdown structure. The model of evaluation is divided into 4 sections, 11 categories, and 60 elements. The model has been tested empirically. Pre-project planning helps to forecast possible risks in the development of the project. In the course of project execution, quality requirement is satisfied through monitoring and control. These help to ensure the operation efficiency of the project, to the extent that the automated system of the building supported by green construction can meet the goal of sustainable development.

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1. Introduction

The intelligent green building in Taiwan has been launched in 2003 with the introduction of the intelligent building emblem evaluation system. In 2005, the intelligent living space industry strategy was proposed in the industrial strategy conference, which made the launch of the intelligent building a policy of technology industry. In 2007, the development of the intelligent living space industry was unveiled. From 2012 onwards, public buildings of NT$50 million or more shall be introduced with the elements of an intelligent green building. From 2013 onwards, all public buildings exceeding NT$200 million are required to apply for the intelligent building emblem and the green building emblem. The industry chain of intelligent green building in Taiwan has picked up its momentum in development.

In this study, the green building and intelligent building emblem evaluation indicators and related regulations effective in Taiwan are incorporated into the scope of IGBP-PDRI evaluation. The Project Definition Rating Index (PDRI) evaluation model developed by the Construction Industry Institute (CII) of USA has been adopted as the methodology in this study. The knowledge of construction project management, green building, intelligent building index are integrated for the design of the standards of evaluation and build up the IGBP-PDRI pre-project planning evaluation model. The model is an attempt to integrate the scope, process, work items and content of intelligent green building project management for the effective maximization of the probability of attaining intelligent green building development to the desired goal by the construction industry.

2. Intelligent Green Building Assessment Indicators of Taiwan

2.1. Intelligent Green Building Assessment Indicators of Taiwan

The green building evaluation system varies by countries due to the differences in climate conditions, national situation, industrial development, social and economic factors with relevant adjustment. The green building assessment indicators used in Taiwan consists of 4 categories and 9 sections. Daily energy conservation and efficient use of water resources are two necessary items in the evaluation. All other items are subject to evaluation per the requirements of the accreditation of the green emblem. In the application for the green building emblem, the applicant must complete the evaluation of 4 of the names of indicators as shown in Table 1 (Ho et al., 2012).

Table 1. Green Building Assessment Indicators used in Taiwan

Indicator	Content of indicator	
	Name of indictor	The subject matter for assessment
Ecology	1. Biological diversity indicator	Ecological green network, the habitat of microorganisms, diversity of plants, soil ecology, light hazards, barriers to the movement of biological creatures
	2. Green intensity indictor	Green intensity, CO_2 fixed volume
	3. Base water conservation indicator	Water conservation, reservoir and permeability, soft skills in flood prevention
Energy efficiency	4. Daily energy saving indictor (required)	Energy savings of the exterior shell, air conditioning, lighting
Waste reduction	5. CO2 reduction indicator	Building materials, CO_2 emission volume
	6. Waste reduction indicator	Balance of earthwork, reduction of waste
Health	7. Indoor environment indicator	Soundproofing, lighting, ventilation, construction materials
	8. Water resource indicator (required)	Utensils for water savings, reuse of rain water and reclaimed water
	9. Water pollutants and solid waste improvement indicator	Diversion of rain water and water pollutants, classification of waste, compost

The green building rating and assessment system of Taiwan is based on the 2012 version stated in the Green Building Evaluation Handbook (Fundamental). Over the past 20 years, the parameters resulting from the implementation of green building policy are subject to assessment and grading by dyadic standard deviation. The rating system contains a scale of 5 levels as the standard for the award. In other words, a score of 95% and higher is