Construction Management and Dynamic Building Structure's Sustainability on Engineering's Technology and Human Development

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Abstract. Construction Management (CM) and Dynamic Building Structure (DBS) constitute indispensable factor within Sustainability Perspective in general and in Environmental, Social and Governance (ESG) within Global Perspectives. Precisely, this paper elaborates discourse on Civil Engineering and Industrial Engineering, including the ergonomics and its anthropometric measurement. The CM and DBS in this paper refers to office activities that involves activities carried out in a room to carry out certain business activities. In general, office activities in Indonesia are carried out by all middle and upper business entities in Indonesia. Generally, current office activities are dominated by the design of open space offices, with the aim of increasing collaboration between employees within the office. The objective of this paper is to observe and provide solutions for workers that experience distractions from co-workers such as talking too loudly so they have higher levels of stress difficulty concentrating and motivation. One of the solutions refer to use of partitions to avoid people experiencing claustrophobia or fear of tight spaces and to create a space of privacy for each employee. Subsequently the discourse on CM and DBS is intertwined with the concept of Environment, Social and Government (ESG) within Global Perspectives. This paper provides solutions within perspective on Civil Engineering and Industrial Engineering's Technology and Human development. Ultimately, this paper combines theoretical and empirical perspective within the Local Wisdom in Indonesia and subsequently in Global Perspectives.

1. Introduction

Construction Management (CM) and Dynamic Building Structure (DBS) constitute indispensable factor within Sustainability Perspective in general and in Environment, Social and Government (ESG) within Global Perspectives. Precisely, this paper elaborates discourse on Civil Engineering and Industrial Engineering. To some extent, sustainability on engineering's technology and human development requires perspectives vis-a-vis environmental, social and governance (ESG) principles. ESG principles have been undergoing years of its development prior its initial proposal in 2004. Countries within global perspectives commence and continue to generate leverage ESG principles accordingly [1].

2. Literature Review

ESG principles is deemed as mainstream, and its implementation has widened in the practical field. Subsequently, literature reviews on ESG theoretical and empirical have been spreading exponentially. To some extent, ESG principles are applicable in financial area, but it is expanded to construction management and dynamic building structure's sustainability on engineering's technology and human development [2-6].
Construction Management (CM) is another perspective that this paper is elaborated other than Dynamic Building Structure (DBS). To some extent, Construction Management has its widened perspective on Construction Management Risk (CMR) as the primary leverage of developed countries, including Indonesia. The CMR is intended for sustainable development and its risk factor [7].
The mentioned paper elaborates the office ergonomics, as part of its further deeper analysis, not to mention the trilogy safety work level measurement, comfort work level and ease measurement of motion, as depicted in Figure 1. Those elements of trilogy are further elaborated in the specific sub elements as case-by-case situation and layout of office [8].

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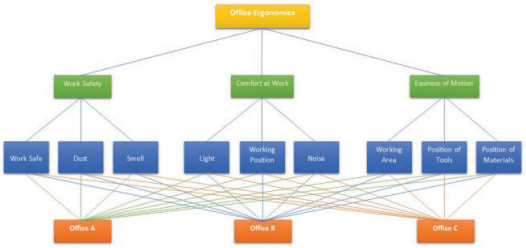

Fig. 1 The hierarchical model on office ergonomics

Ergonomics defined as is multi-interactions among environment and work (machine)–human interaction. Within ergonomics domain, there are meticulous examination on optimization study of designs. These designs are focused on the human use and work-life conditions. In this paper, office ergonomics is rearranged vis-à-vis working space and the work itself, and vis-à-vis science of ergonomics. These rearrangements are complying wide array trilogy among comprehensive factors of anatomy, within physiology, and eventually psychology. This trilogy is identified by its characteristics and capacity. Subsequently, the conformity is obtained among the work and the human being, and eventually it provides the highest efficiency with the least fatigue [9]. Ultimately, to some extent, this office ergonomics involves multi variables and wide arrays of noise along with its vibration factors, and its thermal levels, along with light factors within its radiation, and pressure levels [10].

To some extent, Construction Management (CM) is deemed as widely implemented methods and tools to solve complex problem in CM including the office ergonomics.

This CM is further widely cited in several research and its SCOPUS Journal as depicted in title in Table 1

Table 1. Construction Management in International Journal Title

Title
A dynamic model for assessing the effects of management strategies on the reduction of construction and demolition waste
Environmental and economic impact assessment of construction and demolition waste disposal using system dynamics
A model for cost-benefit analyst of construction and demolition waste management throughout the waste chain
A prototype system dynamic model for assessing the sustainability of construction projects
A model for evaluating the social performance of construction waste management

The 1st title constitutes the research work of Yuan, Chini, Lu and Shen, precisely on the effects of management strategies relate to construction and demolition waste [11]. Furthermore, the 2nd title constitutes the research work on environmental and economic, that is the trigger for ESG in term of system dynamics [12]. To elaborate further the perspectives on environmental and economic, subsequently the 3rd title elaborates the cost-benefit model, vis-à-vis the systems dynamics [13].

Meanwhile for 4th title, the research on prototype in term of system dynamic and its model refers to the sustainability as intended for assessment purpose [14]. Subsequently, the similar system dynamics model is intended to determine the purpose in construction [15]. Ultimately, the work on social performance is also conducted for the purpose of evaluation [16].

3. Methods

In brief, this paper constitutes hybrid of both quantitative and qualitative methods, within research methodology and design methodology. Precisely, it combines both theoretical and empirical analysis on CD and DBS on Engineering's Technology and Human Development. First, as theoretical perspectives, the literature review in prior session constitutes the overview on the elaboration on the following perspective, not limited to ESG, CM and DBS, and to some extent to Sustainability on Engineering's Technology and Human Development. Second, as the empirical perspectives, the implementation relates to one of the product marketing companies that are members of the High Point group, engaging in office furniture, education, residential and hospitality. In addition to the furniture sector, High Point Office itself also produces decorative products in the form of flooring and acoustics.

4. Data Collection

To begin with, the data collection commences with the Anthropometry Measurement of D1 until D36 based upon *www.antropometriindonesia.org* and eventually it is elaborated within data collection with purposive sampling of respondents. Subsequently, the data collection based upon comparison within Statistics Trends of ESG [1] within range of years among 2004 – 2020, as depicted in Table 2.

Table 2. Statistics Trends of ESG

Keywords	Strength	Begin	End	Duration	2004–2020
company	4.36	2004	2009	5	
framework	4.31	2005	2014	9	
technology	3.98	2006	2010	4	
perspective	3.37	2006	2009	3	
altruism	3.14	2006	2012	6	
capability	2.99	2008	2011	3	
competition	3.66	2010	2013	3	
consumption	3.17	2012	2013	1	
choice	3.07	2012	2013	1	
stakeholder theory	2.97	2012	2013	1	
organization	3.28	2013	2014	1	
philanthropy	4.63	2015	2018	3	
self-regulation	4.32	2015	2018	3	
standard	3	2015	2016	1	
financial performance	4.75	2016	2017	1	
firm value	3.67	2017	2020	3	
moderating role	3.2	2018	2020	2	
incentive	3.18	2018	2020	2	
director	2.91	2018	2020	2	

5. Results and Discussion

Table 3 First Anthropometry Measurement D1 until D36

Dimension	Remark in cm	5th	50th	95th	SD
Dimension 1	Height	117.54	152.58	187.63	21.3
Dimension 2	Eye Height	108.24	142.22	176.2	20.66
Dimension 3	Shoulder Height	96.6	126.79	156.99	18.36
Dimension 4	Elbow Height	73.13	95.65	118.17	13.69
Dimension 5	Hip Height	55.33	87.3	119.27	19.43
Dimension 6	Bone Height	48.58	66.51	84.44	10.9
Dimension 7	Fingertip Height	40.56	60.39	80.21	12.05
Dimension 8	Height in sitting position	60.93	78.1	95.28	10.44
Dimension 9	Eye Height in sitting position	51.11	67.89	84.68	10.2
Dimension 10	Shoulder Height in sitting position	37.75	54.89	72.03	10.42
Dimension 11	Elbow Height in sitting position	10.84	24.65	38.47	8.4
Dimension 12	Thigh Thickness	3.75	14.7	25.65	6.66
Dimension 13	Knee length	37.72	49.9	62.08	7.41
Dimension 14	Popliteal length	30.1	39.88	49.65	5.94
Dimension 15	Knee height	36.16	48.12	60.08	7.27
Dimension 16	Popliteal height	31.03	40.07	49.1	5.49
Dimension 17	Shoulder width	26.35	38.75	51.16	7.54
Dimension 18	Upper Shoulder	15.44	31.32	47.19	9.65
Dimension 19	Hip Width	21.65	32.32	43	6.49
Dimension 20	Chest thickness	9.73	19.22	28.71	5.77
Dimension 21	Belly thickness	11.02	20.58	30.14	5.81
Dimension 22	Upper sleeve length	21.85	32.04	42.23	6.2
Dimension 23	Lower sleeve length	26.66	40.53	54.4	8.43
Dimension 24	Long arm span forward	48.36	66.18	84	10.83
Dimension 25	Shoulder length-hand grip forward	43.75	56.72	69.7	7.89
Dimension 26	Head length	10.77	17.91	25.05	4.34
Dimension 27	Head width	12.47	16.05	19.64	2.18
Dimension 28	Hand length	11.64	17.05	22.47	3.29
Dimension 29	Hand width	3.69	9.43	15.17	3.49
Dimension 30	Leg length	14.59	22.73	30.87	4.95
Dimension 31	Leg width	6.29	9.14	11.98	1.73
Dimension 32	Length of arm side arm	111.41	152.71	194	25.1
Dimension 33	Elbow span length	57.17	79.88	102.59	13.81
Dimension 34	Head grip height up in a standing position	138.32	185.76	233.2	28.84
Dimension 35	Grip height up in sitting position	80.24	113.42	146.61	20.17
Dimension 36	Length of hand grip forward	45.52	64.51	83.5	11.54

From the anthropometry data and statistics trends of ESG, first, to some extent, the discussion refers to the pain and prevalence and severity (Institute of Medicine, 2011). The dimension from D1 until D36 are further interpreted as range of pain severity level from 0 until 5. These 0 and 5 levels indicates the absence of pain and the highest available pain. Any increment of improvement in term of reduced pain severity level is resulted from the treatment of physical therapy and its relevancy vis-à-vis musculosketal disorder. To some extent, the musculosketal pain during the person lifetime is resulted from the working environment, including the office ergonomics [17].

6. Conclusion

Construction Management (CM) and Dynamic Building Structure (DBS) constitute indispensable factor within Sustainability Perspective in general and in Environmental, Social and Governance (ESG) within Global Perspectives. Precisely, this paper elaborates discourse on Civil Engineering and Industrial Engineering, including the ergonomics and its anthropometric measurement. The CM and DBS in this paper refers to office activities that involves activities carried out in a room to carry out certain business activities. In general, office activities in Indonesia are carried out by all middle and upper business entities in Indonesia. Generally, current office activities are dominated by the design of open space offices, with the aim of increasing collaboration between employees within the office.

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This paper constitutes hybrid of both quantitative and qualitative methods, within research methodology and design methodology. Precisely, it combines both theoretical and empirical analysis on CD and DBS on Engineering's Technology and Human Development.

As results and discussion, from the anthropometry data and statistics trends of ESG, first, to some extent, the discussion refers to the pain and prevalence and severity. The dimension from D1 until D36 are further interpreted as range of pain severity level from 0 until 5. These 0 and 5 levels indicates the absence of pain and the highest available pain. To some extent, improvement increment is identified as reduced pain severity level. This level is originated from physical therapy treatment and its relevancy vis-à-vis musculosketal disorder. To some extent, the musculosketal pain throughout person lifetime is originated from the working environment, not limited to office ergonomics

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