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ANALYSIS OF CONTRACTOR COMPANY'S NEEDS ON THE COMPETENCE OF CONSTRUCTION PROJECT MANAGEMENT FOR GRADUATES OF CIVIL ENGINEERING DEGREE

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ABSTRACT
This study aims to analyze the level of needs of contractor companies to the competence of construction project management for graduates of civil engineering scholars. The research variables consisted of a group management process and a construction project management knowledge area consisting of 53 indicators adopted from the Project Management Body of Knowledge 5th standard. The research data were collected from 130 small, medium and large qualified contractor companies in East Java-Indonesia using Likert Scale (1-5). Respondents are contractor directors and contractor managers. The sampling technique uses combination of purposive sampling and simple random sampling method. Methods of data analysis using Customer Satisfaction Index (CSI) and Importance Performance Analysis (IPA). The result of this research concludes that the requirement index of contractor to the competence of construction project management graduate of civil engineering graduates is obtained at 61.92% or in the category of graduates quite competent in the field of construction project management. There are 23.81% of contractors answered very competent, 40.48% competent, 21.43% competent enough, 9.52% incompetent and 4.76% very incompetent. There are 14 main priority factors that need to be improved by the civil engineering bachelor's education provider to improve the competence of graduates in the construction project management.

KEYWORDS: competence, construction, project management, civil engineering

1. INTRODUCTION
At present the number of contractor companies in Indonesia reaches around 145 companies consisting of small, medium and large qualification companies. In fact, contractor companies have contributed about 7-8% of GDP per year, absorbing the national budget (APBN) of Rp 750 trillion per year, involving a workforce of about 15-20 million people and a multiplyer effect in the economy. The existence of Indonesian contractor companies becomes quite strategic in the absorption of national workforce, especially to realize the Masterplan of Acceleration and Expansion of Indonesia Economic Development (MP3EI) [1]. Therefore, contractor companies in Indonesia must have high performance and competitiveness in order to operate sustainably [2] [3] [4].

Some important factors that need to be considered by contractor companies to have high performance and competitiveness include: companies must have competent human resources in construction project management [5] [6]. The internationally recognized competence standards for construction project management are the standards of competence of a global construction project management such as the Project Management Body of Konowledge5th (PMBOK) [7], International Standards Organization (ISO)[8] or PRINCE 2. The construction project management standards are now widely used by some countries than some other management project standards.

The PMBOK5th Standard [7] is essentially a standard of construction project management competency consisting of two main management, namely;1) Project management process is a document of systematic stages of project management consisting of 5 (five) stages: project initiating, project planning, project excuting stage, project monitoring & controlling stage, and closing project, 2) project management knowledge area, is a document that describes the knowledge area that is within the scope of the project management profession,

consists of 10 (ten) knowledge areas management, namely: integration, scope, time, cost, quality, human resource, communication, risk, procurement and stakeholder [7][9].

The need of contractor companies to the competence of construction project management in Indonesia is very important and necessary [10] [11] [12]. There is an indication that the competence of project management taught in private or public universities is still inadequate and not yet compatible with the competencies required in the workplace [13] [14] [15]. This study aims to analyze in depth about the needs of contractor companies to competence in construction project management graduates of civil engineering in Indonesia. The expected output is to provide useful information for higher education of civil engineering majors related to construction project management competencies required in the world of work.

2. MATERIALS AND METHODS

The research data was collected through a survey based on user-approach using a quantitative descriptive approach [16] [17]. Primary data collection is done by distributing Likert scale questionnaires (1-5) to contractor companies operating and having business certification office in East Java-Indonesia Province. The sampling technique uses a combination of purposive and proportional sampling methods. The study respondents were the owners or managers of small, medium and large qualified contractor companies of 130 contractor companies consisting of 72 small qualification firms, 36 secondary qualifications and 22 large qualifications. The research variable consisted of 53 variables consisting of 53 indicators adopted from PMBOK5th standard [7], consisting of: 1) project initiating stage, 2) project planning stage, 3) project excuting stage, 4) project monitoring & controlling stage, 5) clossing stage and 6) project knowledge management area [7]. Validity and reliability test carried out through preliminary research with questionnaires distributed to 25 respondents.

This research is a SERVQUA model, generally using Customer Satisfaction Index (CSI) method and Importance Performance Analysis (IPA) Method [18] [19]. The method of Customer Satisfaction Index (CSI) consists of process stages including: (1) Determining Mean Importance Score (MIS) and Mean Satisfaction Score (MSS), (2). Create a weight factor (WF), (3). Creating Weighting Score (WS), and (4) Determining CSI. Criteria for competency index of graduates of civil engineering are categorized based on the following index values: I). the index value is 81% - 100% (very competent), II). 66% -80.99% (competent), III). 51% -65.99% (competent enough), IV) 35% -50.99% (incompetent) and V). 0% -34.99% (very incompetent). While the method of Importance Performance Analysis (IPA) [20] [21], consists of the process of stages: (1) Calculating the level of respondent's suitability based on the level of performance and importance, (2) Calculating the level of implementation, (3) Calculating the attributes of importance and performance, and (4) Mapping in Cartesian diagram. CSI and IPA calculation formulas are used empirical formulas that have been commonly used by previous researchers [16]

3. RESULTS AND DISCUSSION

The result of T-test test using SPSS shows that the research instrument is valid and realibel, so the instrument can be used for further research. Based on the answer of 130 respondents, calculated Mean Importance Score (MIS) and Mean Satisfaction Score (MSS) using SPSS. Then evaluated the gap between the needs of the contractor to the competence of the field of project management graduate civil engineering graduate. Result of gap analysis and requirement index on graduate competence can be seen in Table 1.

From Table 1 above can be calculated Customer Satisfaction Index (CSI) = 309.62 / 5 = 61.92%. This suggests that the contractor feels the graduates of civil engineering graduates are competent enough. The gap analysis is calculated to evaluate the contractor's need for the graduate competency of civil engineering by calculating the gap between the competency level score and the need-level score for all indicators. The results of the calculation of the gap analysis can be seen in Table 1, showing that there are contractors answered 23.81% very competent, 40.48% competent, 21.43% competent enough, 9.52% incompetent and 4.76% very not competent.

Table 1 Gap Score and Competency Need Index of Construction Project Management

Var	MIS	MSS	WS	GAP	Index	Var	MIS	MSS	WS	GAP	Index
1	3.323	3,930	6.833	13	I	28	3,538	3,905	7.294	27	III
2	3.385	4,100	7.254	32	IV	29	3,638	3,881	7.003	28	III
3	3.700	4,120	7.976	33	IV	30	3,546	3,929	7.783	28	II
4	4.123	4,120	8.888	12	I	31	3,438	3,952	6.966	10	I
5	4.138	4,140	8.973	20	II	32	3,400	3,810	7.231	29	III
6	4.085	4,120	8.806	33	IV	33	3,631	3,976	7.390	16	II
7	3.931	3,930	8.082	14	I	34	3,592	4,000	7.291	17	II
8	3.923	4,071	8.360	14	I	35	3,346	3,690	7.113	11	I
9	3.754	3,857	7.578	13	I	36	3,462	3,810	6.779	11	I
10	3.485	4,071	7.425	12	I	37	3,469	3,714	7.556	16	II
11	3.531	4,024	7.436	19	II	38	3,692	3,976	7.520	17	II
12	3.569	4,071	7.606	12	I	39	3,562	3,738	6.463	26	III
13	3,577	4,238	8.309	10	I	40	3,600	3,833	6.902	17	II
14	3,577	4,048	7.577	15	II	41	3,646	3,857	6.744	17	II
15	3,715	4,119	7.711	26	III	42	3,600	3,833	7.684	18	II
16	3,592	4,048	7.871	26	III	43	3,600	3,833	6.968	18	II
17	3,577	3,587	7.252	29	III	44	3,623	4,048	7.223	34	IV
18	3,400	3,976	7.444	30	III	45	3,631	4,119	7.361	34	IV
19	3,585	4,286	7.075	29	III	46	3,592	3,952	7.223	19	II
20	3,662	4,095	8.040	28	III	47	3,662	3,905	7.675	20	II
21	3,623	3,952	7.848	27	III	48	3,692	3,929	7.827	20	II
22	3,508	3,952	7.495	9	I	49	3,546	3,952	7.431	19	II
23	3,538	3,833	7.256	9	I	50	3,538	3,929	7.483	43	V
24	3,569	3,905	7.099	17	II	51	3,562	3,976	7.592	45	V
25	3,469	3,857	6.833	18	II	52	3,508	3,587	7.335	20	II
26	3,569	4,167	7.254	18	II	53	3,592	3,952	7.275	39	V
27	3,308	4,024	7.976	17	II			Total	309,62		

Source : Analysis Result

The results of the analysis of Importance Performance Analisys (IPA) are described in the diagram of the kartisius divided into four quadrants, namely quadrants A, B, C and D. Each quadrant has criteria: quadrant A (top priority), quadrant B (important priority), quadrant C (less important for contractors) and quadrant D (not important, but excessive implementation). The results are as shown in Figure 1 below.
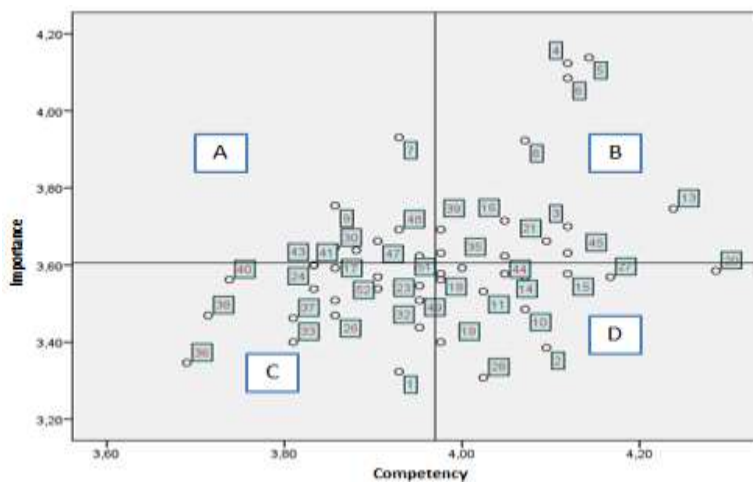

Figure 1. Cartesian Importance Performance Analysis Diagram

The IPA results as shown in Figure 1 can be explained as follows:

Quadrant A : Indicators in this quadrant are a high priority for increased competence in construction project management from civil engineering graduates as they have a major impact on the needs of contractor companies. After analyzing with IPA, there are 14 indicators in this quadrant: 1) defining project activity, 2) estimating project activity resources, 3) planning risk management, 4) preparing material procurement specifications, 5) managing procurement, 6) closing project activities, 7) project closing meetings, 8) cost management, 9) quality management, 10) risk management, 11) integration management, stakeholder management, 13) communication management, and 14) planning quality management.

Quadrant B: Indicators of contractor company's need for construction project management competencies from civil engineering graduates residing in this quadrant need to be maintained. There are 15 indicators included in this quadrant: 1) planning project management, 2) creating work breakdown structure (WBS), 3) defining project activities 4) preparing project activities, 5) estimating the duration of activities, 6) calculating project budget , 7) planning a project communication system, 8) conducting quantitative risk analysis, 9) planning risk response, 10) managing project team, 11) controlling project schedule, 12) monitoring and control risk; 13) closing procurement; 14) project scope management and 15) time management.

Quadrant C: Contractor's needs indicators for the competence of construction project management from civil engineering graduates residing in this quadrant are deemed not to be important for the contractor to be required whereas the level of competence is normal or sufficient. There are 13 indicators included in this quadrant: 1) collect project documents, 2) prepare project implementation guidance, 3) develop quality assurance, 4) develop project team, 5) create integrated change control, 6) verify project scope, 7) controls project costs, 8) develops quality control, 9) produces quality performance reports 10) human resource management, 11) procurement management, 12) controls the scope of the project, and 13) estimating costs.

Quadrant D: Indicators of contractor company's need for construction project management competence from civil engineering graduates residing in this quadrant are overestimated in their implementation, this is mainly due to the fact that the contractor considers the implementation of these indicators to be less important, but the implementation is very both by college so it is very satisfying. There are 11 indicators included in this quadrant, among others; 1) identify stakeholders, 2) estimate the duration of activities, 3) develop project schedule, 4) plan procurement, 5) prepare project teams, 6) develop human resources, 7) close procurement (purchasing), 8) manage stakeholder needs, 9) monitor and supervise the work, 10) make security procurement, and 11) prepare the project team.

4.   CONCLUSION

Based on the results of the Customer Satisfaction Index (CSI) or the contractor's corporate interest index of competence needs in construction project management for civil engineering graduates, the competency index is obtained at 61.92% or in sufficient competent categories. There are 23.81% of contractors certifying that civil engineering graduates are highly competent, 40.48% competent, 21.43% competent enough, 9.52% incompetent and 4.76% very incompetent in construction project management. Of the total of 53 factors there are 14 factors that become the main priority to be increased competence by public / private universities because it is very influential for the needs of contractors. There are 15 factors that have been well implemented to improve graduate competence in construction project management by public / private universities, therefore these 14 factors must be maintained.

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