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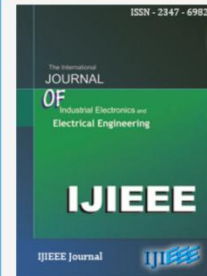
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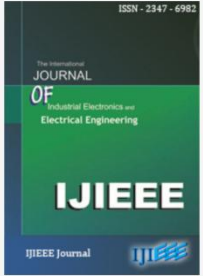
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INNOVATION CAPABILITY (IC) DASHBOARD BASED ON INTELLECTUAL CAPITAL: A CONCEPTUAL FRAMEWORK

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Abstract- The measurement of innovation capability has been recognized as a vital process in the management of continuous innovation activity. Various models of innovation capability measurement have been developed and applied in many companies. However, the measurement methods developed tend to focus on the aspect of tangible assets or tangible capital of the companies. The measurement models of innovation capability based on the intangible capital aspect such as intellectual and knowledge capital are still limited. This article is intended to propose a conceptual framework for the measurement of innovation capability based on the intellectual capital in the form of dashboard. The models of measurement used three elements of intellectual capital, that is, human capital, structural capital, and social capital with the emphasis on the role of social capital in order to increase the innovation capability for the intra-and inter-organizational social capital development.

Key words- Innovation Capability, Intellectual Capital, Dashboard.

I. INTRODUCTION

Many studies have indicated that innovation is the most essential factor in the company to achieve the *long-term survival and sustainable competitiveness* [1]-[2]-[3]). Alasoini et al.[4] stated that the company competitiveness is determined by its capability in innovation. In facing the fast-changing business condition, every company needs to monitor its capabilities in innovation continuously. Steiber&Alange [5] stated that in order to monitor the continuous innovation capability, it is necessary to have a measurement system which can monitor the ability to continuously innovate. The measurement of innovation capability has been recognized as a vital process in the management of continuous innovation activity [6]-[7]. Various models of innovation capability measurement have been developed and applied in many companies. [8]-[9]-[10].

However, the methods tend to focus on the aspect of tangible assets or tangible capital of the companies. Several characteristics of dimension and size of capability which are often used are, among others, the number of product innovation, then number of process innovation, the number of patent produced, the productivity of R&D activities, the total cost of R&D. The measurement models of innovation capacity based on the intangible capital aspect such as intellectual and knowledge capital are relatively still limited. Whereas, in modern economy era with the basis on knowledge and fast technology change, intellectual, not physical capital, is most important asset [11]. Many studies showed a correlation between intellectual capital and innovation capability. [12]-[13]-[14]. Marr et al.[15] even stated that the value of a company at present is mostly determined by the intellectual capital (IC). This article is intended

to propose a conceptual framework of innovation capability measurement based on intellectual capital in the form of dashboard. The outcome of this research is a model that can assist companies to monitor its capabilities in innovation continuously.

II. INNOVATION CAPABILITY

Innovation capability is a set of comprehensive characteristics of a company or organization which can be used to facilitate and support its innovation strategies. This set of characteristics consists of various competences which serve as the asset, capital, special human resources of the company in doing the innovation activities.[16] Peteraf [17] stated that innovation capability is a portfolio of the company resources which is heterogeneous and plays an important role to influence the variabilities of the control level of company finance. The innovation capabilities of a company can, in principle, be influenced by various factors. [18]. Several former studies tried to classify the factors influencing the innovation capability: classification based on asset: science research asset, process innovation assets, product innovation asset dan esthetic design asset [19]; based on organization function: learning capability, R&D capability, resources allocation capability, manufacturing capability, marketing capability, organizing capability, and strategic planning capability [20]; based on knowledge: structural capital, dan leadership capital. [21], and based on collaboration form: collaboration within the department, collaboration within the business function, collaboration within the company, collaboration within the group, collaboration with 3rd parties, collaboration with supplier, collaboration

with customers/partners, and collaboration with customers of the customer [10]

III. INTELLECTUAL CAPITAL

In principle, intellectual capital can be viewed as the collection of knowledge owned by an organization. [13]-[21]. Bontis [22] stated that covers all the knowledge of employees, organization, and their competence to create the added value which results in the sustainable competitive advantage. Furthermore, Williams [23] stated that intellectual capital is the information and knowledge which is applied in the job to create values. There are various approaches in the classification of intellectual capital elements. But in general, these elements in the intellectual capital consist of human capital, Structural Capital (SC), dan Customer Capital (CC) [24]. Farenhof et al [25] mentioned a meta model approach using four elements of four capital, that is, human capital, structural capital, relational capital, and social capital.

According to Bontis [26], human capital is a combination of knowledge, skills and ability to create innovation, and ability to complete the task, consisting of the company's values, cultures and philosophy. Structural capital is the potential assets of the company which is kept in the organization, and company management. Customer capital is the ability of the company to identify the need and want of the market so that it can produce a good relationship with those outside the company. Edvinson & Malone [27] stated that the effort to create values based on intellectual capital will not happen if it relies on one element of intellectual capital only. The value of a company will increase if there is a good interaction among the elements of all capitals..

IV. CONCEPTUAL FRAMEWORK

The measurement of innovation capability based on the intellectual capital is developed based on the former studies which showed a correlation between intellectual and innovation capital. [12]-[13]-[14]. All of the measures, models and tools are based on previously published research finding.

The measurement of total innovation capability based on intellectual capital in the form of dashboard used three elements of intellectual capital, that is, human capital, structural capital, dan social capital. In our conceptual framework, the two elements of intellectual capital, that is, relational and customer capital is the part of the social capital. We are emphasis on the role of social capital in order to increase the innovation capability because several studies showed that the role of the social capital is increasing in the recent years. [28]-[29]

In human capital and structural capital, the measurement model adopts the approach of Technology Atlas Project, which defines technology based on the meaning from Economic and Commission for Asia and The Pacific (ESCAP) [30] which consist of four components, that is, Human ware, person embodied technology (human abilities): the competence of human resources, consisting of knowledge, skills, attitude (wisdom, creativity, achievement, experience, motivation), Technoware, object embodied technology (physical facilities; technical ware): consisting of tools, equipment, machines, physical instruction used human being in operating the transformation. Infoware, document embodied technology (document fact; information ware): in connection with process, procedures, technique, method, theories, specification, design, observation, manual and other facts expressed via publication., documentation, blue print. Orgaware, institution embodied technology (organizational frame work; organizational war/institutional ware): is used to protect physical facilities, human ability and facts which consist of practices of management, linkages, organization structuring to achieve positive results.

Social capital will be grouped into two, that is, intra organizational social capital dan inter-organizational social capital. So far, the measurement of social capital focuses more looking at company ability building the interrelationship with external partners (inter-organizational social capital). Whereas, intrarrelationship between components. departments in internal company also affects the innovation performance in a company.

In this model, intra-organizational social capital adopts two forms of collaboration proposed by [10], that is, Collaboration within the department and collaboration within the group/team. While the measurement model on the inter-organizational social capital using five forms of external linkages, that is, backward linkages as with the supplier dan consultant; forward linkages, such as consumers, and horizontal linkages such as with similar companies, and the competitors;, public linkages such as with the universities, government research institute, and informal linkages such as with exhibition, related professional association [31]. External linkages in principle portrays the organization ability to build collaboration and network effectively with all external parties which offers alternative resources and portrays the ability to utilize all those resources. Romijin and Albaladejo [32] stated that the capability source of organization innovation is not only from internal company but also from external company, especially in the internet and digital era at present, an era which offers connectivity and the company has great potentials to innovate collaboratively.[33].

Even when the consumer's need changes fast, the tight competition, the fast-changing technology, du Plessis [34] stated that innovation activities in an organization relies on the availability of information and knowledge from the internal and external companies. Lall [35], stated that the innovation capability of the company is determined by its ability to absorb and use various skills and knowledge coming from the external companies. In the knowledge economy era at present, the company innovation should not depend on internal capacities

only but it should be completed with the resources from external companies.[31]. The company ability to build the effective external linkages can be measured from the company ability to have access to the strategic organizations and ability to identify the valuable knowledge which can be the complement for the asset of knowledge of internal organization. In overall, the proposed conceptual framework picture can be seen in the following figure1:

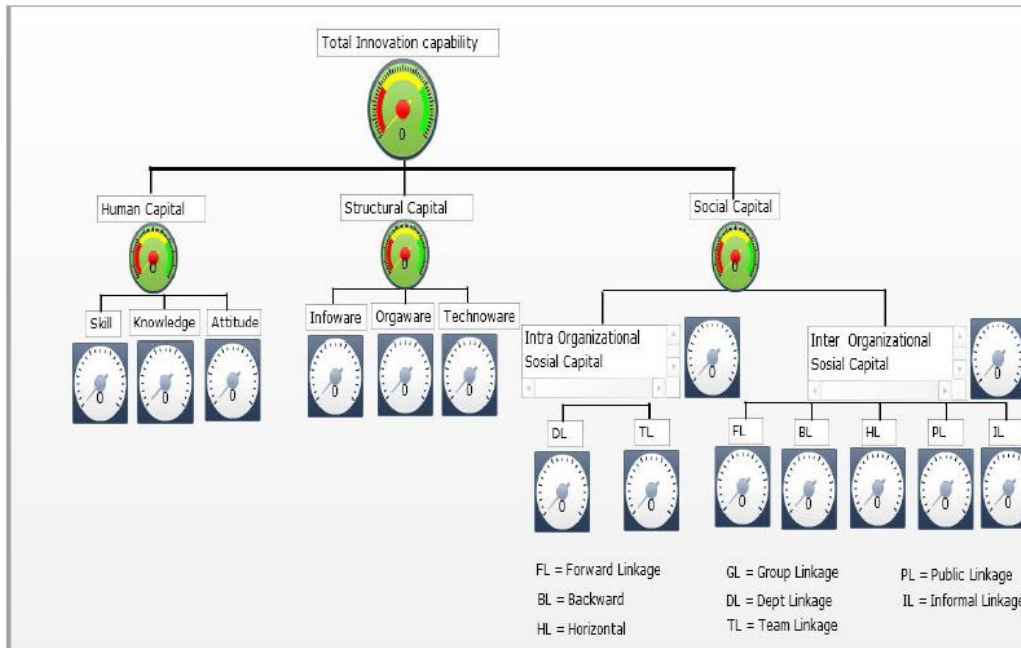


Figure 1. Conceptual framework of Innovation capability dashboard

ACKNOWLEDGMENTS

Authors would like to thank The Indonesian Ministry of Research, Technology, & Higher Education who has supported the research funding through the applied product research grant.

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