

Triple Helix Model in Indonesian Ict Cluster Development

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Abstract: The main goal of this research is to create a regional cluster innovation model as center of excellence in which is integrated among the industrial cluster. The first step is to determine the dominant factor from the triple helix model that affects the growth of the ICT business cluster. Secondly is to develop the model formulation of regional ICT innovation cluster development as a center of business excellence of industrial cluster. The method of this research was by field observation, direct interview, secondary data and descriptive analysis. The result of this research is a new model of cluster in ICT industry that will optimize the role of government, businesses and academicians.

Key words:

INTRODUCTION

This research was conducted aligned with the national development vision as stated in Indonesian Law number 17 in 2007 about the vision for acceleration and expansion of Indonesian economic development is to “create an independent, developed, just and prosperous Indonesian society”. The core of this approach is the integration of sectoral and regional approach. The goals of developing economic growth centers are to maximize profits from agglomeration and to explore the region’s potential and also to improve Indonesia’s economic development spatial disparity. Overall, economic growth centers and their connectivity have created the Indonesian Economic Corridor. The improvement of economic potential of the region through the economic corridors is one of the nation’s three main strategies.

Strategy and policy of industrial development in Indonesia called "Build Industrial Sector" has put the information technology (IT) industry along with the agro industry and transportation industry as the priorities of industrial development in Indonesia. The aim is the development of regional centers of the IT industry in Indonesia. Indonesian Ministry of Industry as the originator of the grand strategy is very aware of the importance of the growth and development of the IT industry in Indonesia.

ICT infrastructure development in Indonesia is still not yet adequate, the problem is the number of activities or programs related to ICT are scattered in various government agencies, thus there were no strategic planning in supporting the realization of the information society. Therefore it is necessary to determine the direction of the national consolidation of ICT development as well as strategic steps necessary to realize a knowledge-based society. One strategic move is through the development of the ICT industry clusters.

Initiatives to develop the ICT industry can be found in various areas throughout Indonesia, but has yet to show optimal results. In West Java, there are several institutions that develop ICT industry clusters, namely Bandung Techno Park (BTP), Bandung Digital Valley (BDV), Cimahi Creative Association (CCA), Regional IT Center of Excellence (RICE) - PT. INTI, Inkubator Inovasi Telematika Bandung (I2TB) and Incubator Business Center (IBC).

Theoretical Framework

Triple Helix Model: The Triple Helix is an innovative model of the relationship between government, academia and business. Triple helix model was popularized by Stanford University professor, Henry Etzkowitz and University of Amsterdam’s professor, Loet Leydesdorff.

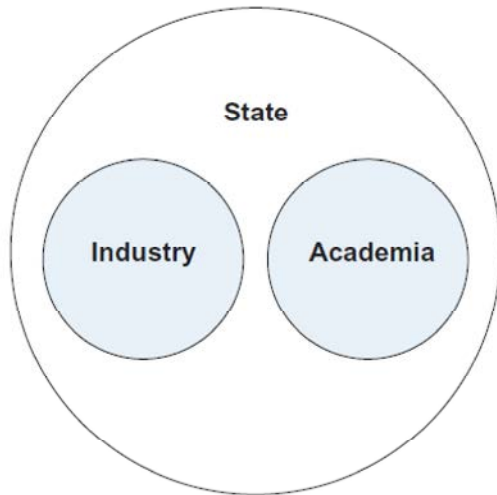


Fig. 1: The First Triple Helix Configuration

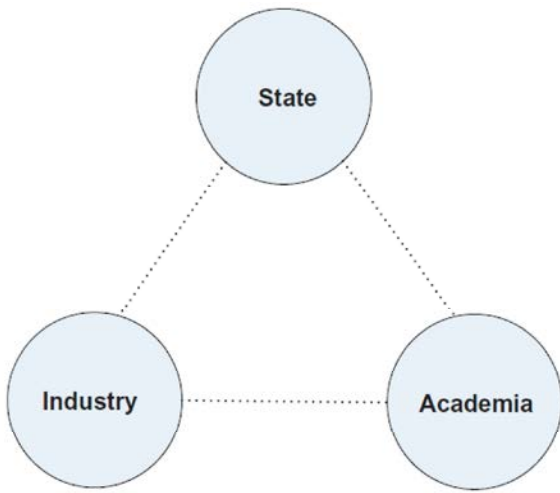


Fig. 2: The Second Triple Helix Configuration

They explained the triple helix model with a different perspective.

Professor Henry Etzkowitz explained Triple Helix Model as a model for network of institutional relationships. He describes the triple helix arrangements between universities, government and industry as institutional partners. Based on this approach, Etzkowitz has raised three dimensions. The triple helix configuration is differ from the network of each element [1, 2].

The first configuration explained that the government covers academics and industry. This configuration is shown in the former U.S.S.R nations and Eastern European nations. This model was considered as a failed model of development, as it has minimum space for a "bottom-up" initiative type and innovation tends to be discouraged rather than encouraged [3].

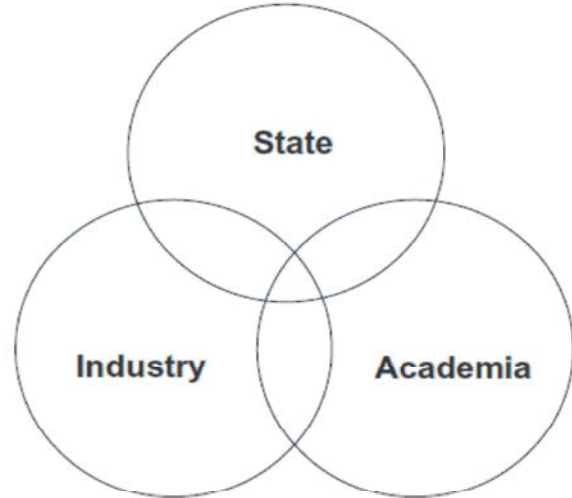


Fig. 3: The Third Triple Helix Configuration

The second configuration pictured that the network was more separated. Elements described in the configuration have a high independent level, so that have made the network connection to be very low. Sweden and the United States are examples of the configuration. This model is designed to reduce the role of government in the previous configuration [3, 4].

The third triple helix configuration reflects overlapping institutional fields. Each element took part in another role, creating hybrid roles for each institution [3].

Another approach, known as the Triple Helix Dynamics of Loet Leydesdorff's perspective. This model produces neo-evolutionary model functional fluxes in communication through the network. There are three communications media that support this approach, namely: 1) scientific communication, 2) economic exchange relations and 3) political intervention [5].

From Leydesdorff's perspective, the third triple helix configuration can become a dynamic overlay. The overlay is the generation of a tetrahedron that emerges from the bottom with four different types of communication. Furthermore, Leydesdorff explained that the three media of communication can be invented and developed further in this overlay [6].

Cluster Characteristics: Cluster is a geographic concentration of enterprises and institutions which are interconnected in a particular system to relate and complement each other. Besides the main enterprises, a cluster may consist of government institutions, academics, as well as other supporting industries that can provide training, education, information and technology support [7].

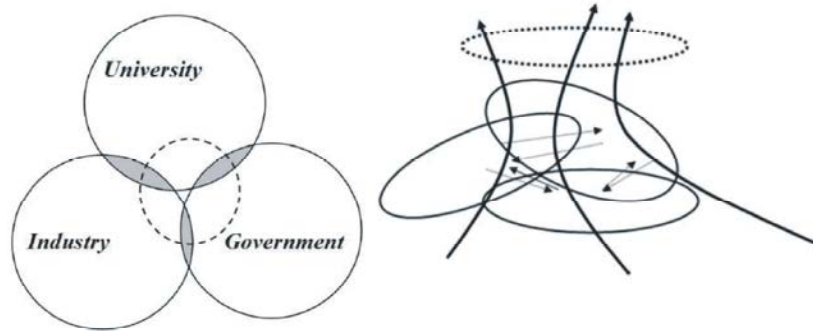


Fig. 4: The Dynamic Overlay of The Triple Helix

Theoretically, centers / clusters are formed due to two factors: 1) historical factors and 2) formation manipulation factors. These factors will form two types of clusters; 1) mature cluster and 2) new cluster [4]. Economic and financial factors are the base of the synergy and cooperation among cluster members. Literature review shows that there are at least three types of economic benefit from the synergies of members in a particular cluster: 1) concentration of skilled workers, 2) access to specialist suppliers and 3) access to facility to gain knowledge. Results from a cluster development pilot project in Indonesia conducted by Japan International Cooperation Agency 2004 (JICA 2004) revealed that the cluster development in Indonesia is limited by the their simple foundation so their social capital can be easily scattered. Social capital is an asset as a form of “formed faith”, “internal bonding”, or “social networking” [8].

The Specific Objective of Our Research Includes:

- Determine the dominant factor affecting the growth of the ICT business cluster.
- Develop the model formulation of regional ICT innovation cluster development as a center of business excellence of industrial cluster.

MATERIALS AND METHODS

The research method was a case study method with the unit of analysis from information, communication and telematics industry cluster. The respondents were institutions in which has operated as an industry cluster, hence we define them as cluster class institutions. The chosen institutions were: 1) Bandung Techno Park (BTP), 2) Cimahi Creative Association (CCA), 3) Baros Information Technology Creative (BITC), 4) Regional Information Technology Center of Excellence - PT. INTI (RICE-INTI), 5) Inkubator Inovasi Telematika Bandung (Telematics Innovation Incubator Bandung), 6) Incubator

Business Center (IBC) - Universitas Gunadarma and 7) Bandung Digital Valley (BDV). The determination of the respondents was purposively selected. The focus of the research was the Regional Innovation Cluster Model; with the nature of the research was time series from 2012 to 2013.

In accordance with the in-depth case study method, the primary data was collected via in-depth interviews and observations. Secondary data were obtained by collecting documents and literature studies. Descriptive analysis qualitative / narrative was used as the analysis technique.

Analysis: In this chapter, the paper explains the results of the interviews with respondents from the ICT industry cluster (companies incorporated under RICE-INTI and Bandung Digital Valley).

The Triple Helix Factor Affecting the Growth of the ICT Business Cluster

Academics: Cooperation between universities and industry in the development of science and technology experienced a variety of problems. And there is lack of coordination between industry, as the users of science and technology and the universities, as a source of knowledge, resulting many of unexploited researches [6].

From the interview, the role of academics for business cluster is as business incubators. Business incubators offers services such as sharing office facilities, technical guidance services (management, marketing, financial trading information, law and technology), help access support (research, professional networking, technology development, international relations and investment), skill development and training (business plan, management, leadership), initial capital: providing access to finance and financial institutions, synergy: collaboration with universities, research institutes, private companies and people in professional and social network (through seminars, exhibitions, agency visits).

Business / Industry: Domestic industry has a tendency to rely on imported products. This shows that there has not been any success from the partnership between the university and industry. In creating partnerships between businesses and academic institutions need a liaison to bridge the two sides. Some developed countries have the privilege to utilize the use of institutional links such as Technology Licensing Office (TLO) to address and manage the licensing and royalties from university research innovation into the industry. TLO serve to encourage commercial investment in the development of invention and discovery. Given this institutional link, expected technology transfer from university to industry effectively and efficiently.

Government: Government has the role as a policy maker. Supporting the National Innovation System, the six elements of a policy framework which was created to regulate the function of government is the macro aspects of innovation, development of licensing supply and demand, with a focus cluster development that creates a culture of innovation. The role of each government agency is still not at the optimum stage either. Another fact is the Regional Innovation System (Sistem Inovasi Daerah), where each region must have a Regional Research Council (Dewan Riset Daerah), but in practice, only 33% out of 550 districts have a regional research council. Another obstacle is there has not been any agreement on the definitions regarding clusters and centers. Government agencies often equalize the definition of clusters and centers. Cluster, by definition, is actually a collection of industry in one particular area, have good relevance in their production process, while centers is a collection of vendors selling the same product.

Other large constraint is the paradigm shift. This requires increasing the paradigm (mindset, attitude and actions) of all actors (businesses, academics, non-governmental parties and the government) in implementing their roles, commitment and consistency. Consequently, the problems are in the structure of budgeting and bureaucratic rigidity.

The Model Formulation of ICT Cluster

Regional IT Center of Excellence-PT. INTI: The Regional IT Center of Excellence is one of several ICT cluster category institutions. It was originated by the Ministry of Industry and has developed throughout the major cities in Indonesia. In Bandung, RICE is organized under a telecommunication enterprise, PT. Industri Telekomunikasi Indonesia (PT INTI). In RICE, the government, through its regional bureau has the role as

the initiator and main organizer. Business, in RICE- PT. INTI's case is the operational organizer and academicians are part of the supporting institutions.

The Ministry of Industry has developed the Regional IT Center of Excellence RICE [9] since 2002 in several regions in Indonesia: Medan (at North Sumatra University), Jakarta (at Trisakti University), Bogor (Bogor City Government), Cimahi (Cimahi Municipal Government), Bandung (PT. INTI), Surabaya, Bali, Manado, Balikpapan and Makassar. However, the RICE that has been intensely studied in this research and demonstrates its performance is the one that organized by PT. INTI. Therefore, the cluster model where RICE by PT. INTI is located became the model that will be promoted in this study to be a role model for future development of other ICT clusters [9].

RICE mission is to: 1) Assist and stimulate the growth and development of new business in the field of telematics industry, 2) Build a business community in the telematics industry in regional and national levels, build a long-term partnership with PT. INTI, 3) As a place for facing competition in the global ICT industry, 4) Prepare sources for future ICT industry companies outsourcing activity [9].

Bandung Digital Valley: Bandung Digital Valley is a cluster category institution initiated by PT. Telekomunikasi Indonesia, Tbk. (PT. Telkom), Indonesia's state-owned telecommunication company. BDV is a place that is used by institutional, SME or Startups to develop their ICT products. This concept was inspired by the Silicon Valley in the United States of America. Silicon Valley is the location where the world's leading IT companies is, such as Google, AMD, Intel, HP, Apple, Cisco and many others. Inspired by this, PT. Telekomunikasi Indonesia, Tbk. took the initiative to develop the creative industries particularly for those related to information and technology. From there, Bandung Digital Valley was born. Bandung Digital Valley was built to serve as a link between techno-preneurs or application developers with the market or industry as absorbent or user of the products [10].

In BDV, the role of government is as policy and regulation maker in the national scale. Business has a major role in BDV since the entire fund to operate this institution comes from PT. Telkom. And academicians have a supporting role to give BDV's tenants knowledge through business workshops.

ICT business cluster has the potential to be developed into a Regional Innovation Cluster. This can be done by determining the companies or business units that

potentially will form clusters or grown interest in forming clusters. The approach taken is to purposely select one or several "figure company". Election "figure company" based on certain characters, especially the sorting criteria that exist between the three parties in the Triple Helix: Academia-Business-Government. This choice was made to be "models" which in the future could lead to the study and assess of prospective company or community - either naturally or through certain stimulants - will form an industrial cluster innovation.

Referring to several sources, it can be seen four general characters of a cluster. Porter [7] suggests that cluster can facilitate the occurrence of agglomeration economies arising from spatial proximity. They are also characterized by regional concentration, which means that most of these companies are engaged in an industry or a particular field of technology. Interaction between regional stakeholders is what distinguishes clusters with pure agglomeration. The latter is, clusters are characterized by high cohesion within a specific field of knowledge.

Based on field studies, with the Triple Helix approach, this research promotes the development of a model of regional innovation cluster based on the economic potential of the region as a center of excellence in driving the growth of the ICT industry. The first model is the model which refers to the cluster managed by the industries, the role model for this category is RICE which is organized by PT. INTI and Bandung Digital Valley [9, 10].

In the cluster model used by RICE-INTI and BDV, the role and dependency between academics, business and government is clearly visible. A good supply chain becomes the requirement for a good system performance. Technology incubator has a role as a vehicle for technology transfer and business development at the core of this model. PT. Telekomunikasi Indonesia, Tbk. and PT. INTI as telecommunications company has research and development division in order to apply the technology transfer and also plays the role of a large corporation which able to run a business incubator.

Below is the current and expected models described based on the triple helix concept. The left model pictures the existing condition, with the government's role as a regulator and has developed a gap with the institution acting as cluster organizer. The academic element is only as a part of the supporting industry (does not appear in the picture). In the next picture, we propose a unity among government, business and academics in corresponding to the third Triple Helix model by Prof. Etzkowitz. In this model, R&D process will be organized between

business as technology users and academics as the researchers and knowledge source. With the unity of the triple helix elements, there is a chance to develop a more organized institution to organize the industry cluster. Supporting and related industries are also embedded as part of the cluster, rather than just external business partners.

CONCLUSIONS

- The Government of Indonesia has launched a national research, development and application of science and technology system. This system provides a legal basis for the use of science and technology, control and promotion. The system also supports the creation of a network that makes all stakeholders have the capacity and ability to work together, and manage them to actively participate optimally. As politicians, however, the role of government is not optimal yet.
- The role of academics that is still not able to provide competitive and commercialization value in the research and development outputs. This drives businesses to use imported products.
- With the new proposed model, we believe that optimization of each role (government, business and academics) can be reached, providing a more developed industry cluster.

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