

# Analysis of Technopolis Role in Increasing Competitiveness

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**Analysis of Technopolis Role in Increasing Competitiveness**

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**Abstract**

The impact of globalization raises a variety of challenges that must be faced by each region, including Aceh Province - Indonesia. Diverse problems come from various sectors such as the economy, macro and financial conditions, imbalance of population growth that will result in unemployment and poverty. The issues will certainly affect the society including the level of regional competitiveness. The main idea of Triple Helix is the importance of synergy between academician, business and government as well as social movement with purpose to develop a knowledge-based intelligence on economic sustainability. The method uses qualitative research that combines data analysis with the relevant aspect. Interview and literature study with key information from Agency for Assessment and Application of Technology (BPPT), rather than source and references from books and internet. Data analysis techniques worked with Miles and Huberman model that is used for data reduction, display and conclusion. According to the Asia Competitiveness Institute (ACI) - National University of Singapore reports that Aceh is ranked 24<sup>th</sup> out of 34 provinces and it is exacerbated by the conditions of macroeconomic stability and financial conditions that are less competitive (that is ranked 27<sup>th</sup> and 26<sup>th</sup>). The level of life quality and infrastructure development is far worse than other regions (that is ranked 15<sup>th</sup>) and this paper intends to outline the roles, challenges and opportunities. Several chances of Technopolis including demographic bonus and the uniqueness of each area are considered but some problems such as legal, government and human research development must be solved. Technopolis must be applicable to increase the competitiveness based on innovation and science.

**Keywords:** Triple Helix; Technopolis; Competitiveness

**1. Introduction**

Globalization is a process that is characterized by the breaking of boundaries to bring

the world together. As a result, the issues of the economy becomes increasingly integrated with other issues such as democratization, science and technology, communication and information.

As part of the global community, Aceh province faces various challenges which come from different economic sectors and imbalance of population growth leading to unemployment and poverty. According to the <sup>6</sup> Asia Competitiveness Institute (ACI) from the National University of Singapore (NUS), the competitiveness of Aceh is ranked 24<sup>th</sup> out of 34 provinces in Indonesia and the unemployment rate reached 9.02% (August, 2014). For macroeconomic instability and financial condition, the province is ranked 27<sup>th</sup> and 26<sup>th</sup> respectively, whereas for the quality of life and infrastructure it is ranked 15<sup>th</sup> in Indonesia.

The condition shows that there is no link and match between science and technology but in the ideal level, science is supposed to be the motor of job creation by improving the quality of human resources. The technology works as a tool to increase the competitiveness through various facilities and offer both in terms of production and job creation. Inefficiency of government bureaucracy and corruption are the problems that always arise and it is essential to give issues related to competitiveness a prior handle. Competitiveness can be increased by adopting innovation and acceleration of comparative areas. It can be realized by creating coherence along with link and match between education and technology, by applying the theory of Triple Helix. The main idea of the theory of Triple Helix is the importance of synergy between academician, business, and <sup>8</sup> government along with social movement.

Triple Helix theory is <sup>8</sup> popularized by Etzkowitz & Leydesdorff as a method of innovation-based policy development and the main idea of the Triple Helix is the importance of synergy between the power of the three poles, that academician, business and government. In Indonesia, this concept is known as the concept of ABG and the purpose of the ABG is the development of a knowledge-based sustainable economy. Triple Helix is the main actor which works to form a space of knowledge, which already has an equivalent understanding and knowledge, which directs the third actor to form a space agreement (consensus space). Here, the three actors have started to make opportunities and commitments on a matter that eventually leads to the formation of space innovation that can later be packed into a creative product of economic value.

The most important thing is the rotation result of the Triple Helix, which is the creation of a space of interaction which is described as follows:

**1.1 Science:**

In this case, individuals from various disciplines concentrate and participate in the exchange of information, ideas and notions.

**1.2 Consensus:**

Commitments that lead to specific initiatives and projects, results in the establishment of new companies.

**1.3 Innovation:**

In this case, innovation is formalized and transformed into knowledge, such as the emergence of business realization, the realization of new products, and participation of financial institutions with government support in the form of incentives, strict law enforcement and so on.

The relationship between creativity and innovation must be understood from the outset.

Creativity is an individual activity that often leads to innovation, while innovation focuses on target problem solving, but rarely leads to creativity.

A successful applicator of Triple Helix concept is Silicon Valley in California, USA and a number of world-class companies have sprung up like Hewlett & Packard, Fairchild Semiconductor, Google Inc. and YouTube. In Indonesia, Technopolis is applied in Pelalawan district, Riau Province and Pekalongan City and Aceh should try to deliver on science. Moreover, technologies like technopolis that can increase the competitiveness of the region.

**2. Research Method**

The method used in this research is a qualitative method which essentially is a holistic method that combines data analysis with relevant aspects. The tools used in this research are interview and literature study where interviews are data collection techniques with depth interview from the respondent, both structured and unstructured. Interviews were conducted with key informants from the Agency for Assessment and Application of Technology (BPPT), head of Incubator Centre, Head of the Research Centre for Science and Technology and some relevant officials. Literature study (library research) is a study that examines the way to find the source and references from books, magazines, and internet. The purpose of the interview and literature studies are as a preliminary study and as a source of information which were both primary and

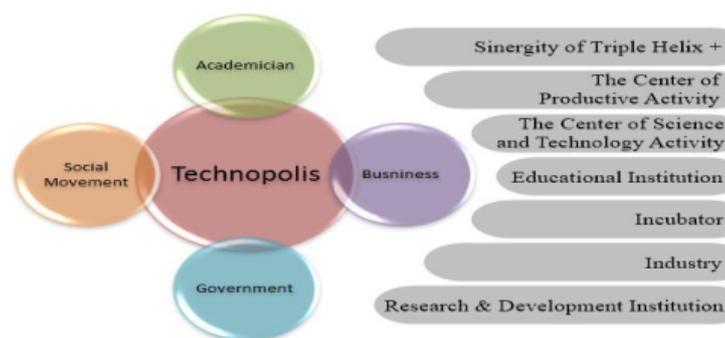
secondary. Data analysis techniques used in this research use the model of Miles and Huberman which suggests that activity in qualitative data is done interactively and continues over time until it is completed. The data analysis is data reduction, data display and conclusion.

### 3. Technopolis

Technopolis is one part of the region's development concept based on technology that is dimensional area of economic development with centres of science and technology that support the acceleration of the development of innovation. The essence of technopolis is to create an environment conducive to collaboration of academician, business, and government (ABG) in order to enhance regional competitiveness based on innovation and science. The development of technopolis could be done through the development/ strengthening/ revitalization of the centres of science and technology, social movement, innovation development, diffusion, and the learning process in building a global reputation that starts from the local action and expediency. Technopolis has a strategic role as a means of building an innovation networks and learning of innovation development. Application of technopolis can be very flexible, that means it is not needed to build a new area which is divided into blocks but a sufficient leverage and spatial elements already exist. Such utilization can be done through the creation of the technopolis icons, which serves as a management institution of technopolis and create relationships between the main actors in it.

The element of technopolis should be applied to the space structure through making the block area so each element can work together and create region relationships that is targeted and sustainable.

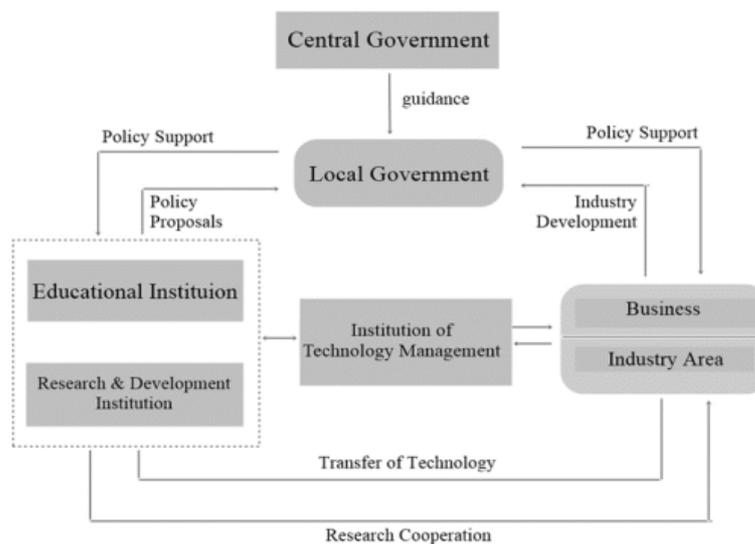
**Figure 1: Illustration of Technopolis and the Elements**



### 3.1 Synergy of Triple Helix

Triple Helix theory reveals the importance of synergy between the strength of academician, business, and government with social movement. The actors construct the creativity, ideas, science, and technology which is very important for the growth of the creative industries and in the technopolis context, the relationships are created between academician, business, and government through a consensus. Consensus can be achieved by creating a clear advantage, especially with those who play a central role in the region. Pouring consensus or common consent between the actors can be poured through the contract or a memorandum of understanding which will have a legal basis. Therefore, a facilitative environment can be realized with the collaboration of the academician, business and government in order to improve competitiveness based on innovation and science. Social movement added an important value to create a beneficial climate for business and investment. In the circulation, the social movement not only became an input of the other actors of technopolis but it is also providing support for the government in the form of supervision and escort of government policy. On the other hand, in the business sector, campaigning and oversee the business community in creating good and conducive climate for business and investment.

Figure 2: Illustration of Institutional Design



Through this institutional design, the future research results and ideas from the academician not only serve for the science needed, but also a solution to answer the problems

that is faced by the government and business, in terms of determining the policies and regulations in product innovation and marketing strategies. On the other hand, the government can give a positive impact to stimulate growth and development of business investment by encouraging a beneficial business atmosphere. Through the reduction of restrictions that complicate the development and business innovation, the works of business innovation are protected, implementing government rules related to business ethics to create a facilitative business competition. Meanwhile, the industry will be able to contribute in creating a good business climate by the implementation of business ethics, commit Corporate Social Responsibility and became a partner of government to support economic growth. These advantages will be correlated with increased competitiveness in order to improve the regional situation and also the national economy.

### 3.2 The Centre of Productive Activity

Unemployment problems, productivity and marketing which is a problem in increasing competitiveness were answered by technopolis through the Productive Activity Centre. Through this productive activities the community can be empowered in various activities such as production, development and utilization of science and technology also venture the capital strengthening activities. In addition, through these elements, technopolis tried to create jobs and new entrepreneurs, developing activities and business opportunities based on local potentials to increase revenue.

### 3.3 The Centre of Science and Technology Activities

The centre of science and technology activities increase competitiveness of industrial centres/business groups through the dimensions and the potential implementation of research results from R & D institutions / universities that produce technological innovation. It is organized through various programs such as mentoring activities for centres of industrial / business group by R & D institutions / universities, strengthening of infrastructure for industrial centres / group effort and partnership between local government with the central industrial / business group, and R & D institutions / universities. With the centre of science and technology activities, it is expected to increase the management of technological innovation (especially marketing) for centres of industrial / business group in an effort to improve competitive

advantage and product commercialization.

### 3.4 Educational Institution

The issue of the quality of human resources is an urgent issue in improving competitiveness as well. Technopolis through elements such as educational institution seeks to provide technology, human resource skills and knowledge to prepare each graduate in a way which will secure them with jobs. To match with that, institutions providing higher education needs to cooperate and adjust the curriculum to fit the needs of the field that help graduates. As a provider of technology inputs and human resources, educational institution it is vital that there is also a place for academics activity and development of science and technology.

#### Incubator

The role of a technopolis in order to enhance the competitiveness is to grow and develop for young Entrepreneur and various kinds of Micro, Small and Medium Enterprises (SMEs) through the support of the partnership/coaching of various business elements. The Centre of Incubator will make an effort to become more profitable as it has financial management and proper organization, with more sustainability, it will have a positive impact on society. Incubation program is provided by the incubator which intends to be a start-up company or a company that is still in the early stages, generally is a new venture or is running less than two years. This is done in view of the problems that have been experienced by entrepreneurs and SMEs beginners as a growth problem. Furthermore, the novice company is expected to be able to generate the transaction, in the sense that the resulting product will be able to be promoted and compete in the market. Innovation of offers and product is done in accordance with the development and market demand as well as characterized in regards to the development of technology utilized. In addition, the company already has a legal entity, so that all processes are carried with no legal questions.

### 3.5 Industry

Technopolis in answering the question of the production process thoroughly by developing an industrial area. As one of the element in technopolis, the industry has a great influence to improve the livelihoods of communities such as improving the quality of human resources and the ability to make optimum use of natural and other resources. In addition, the

industry is a leading sector that will spur development and lift the other sectors such as agriculture and services, which will have a condition causing widespread job opportunities that will ultimately increase revenue and public demand. The increase in revenue and the request indicates that the economy is growing and conducive.

### **3.6 Research and Development Institution**

The need to develop science and technology is very influential in increasing competitiveness. Technopolis through one of the elements that is under research and development strives to meet these needs through applied research and development in the field of technology. In order to improve competitiveness and the economy of a region, it is cooperating with various parties in order to establish partnerships in the development of science and technology, empowerment of regional potential as a contribution to the progress of construction and development of researchers. In a business context, research and development generally refer to activities that are oriented to the future or for the long term both for science and technology which have commercial interests.

## **4. Opportunities and Challenges**

### **4.1 Opportunities**

The application and development of technopolis has had several chances including demographic bonus and the uniqueness of each area. Indonesia is expected to receive demographic bonus will receive and expected of 2010-2035. The proportion of people earning generated demographic dividend which can be utilized as an effort for the development of various sectors, including the application and development of technopolis. Availability of human resources skills enables the development of technology-based education and became one of the ways to increase competitiveness through the implementation and development of technopolis. The people are required to be productive, able to develop creative industry with the use of technology. In addition, the development of applicant in the technopolis can be mapped to the corresponding potential based on the peculiarities of the area. Technopolis based on regional distinctiveness has its own selling points in the business market, because the products produced are regional-based and processed in a way that used high technology, which will create a different output based on each region. Although with the same resources, the development of the

product can be achieved with the application of technology. By utilizing the uniqueness of the area, the product will have uniqueness between regions respectively to avoid the adversarial competition, to create a relationship of mutual support and through relationships that will strengthen the synergy created from one region to another.

#### 4.2 Challenges

On the other hand, application and development of technopolis have some problems such as the absence of relevant legal basis which ensures the continuity of the technopolis. It must include the Medium Term Development Plan (RPJM) and the Long Term Development Plan (RPJP) and local government must be absolutely committed to doing this. Local governments also can use partnerships to maximize application and development of technopolis. Human resource development issues should be resolved as early as possible as it is a long-term investment into the main capital of a country's progress. Government is required to become an agent of development, which should be able to develop all aspects to improve the quality of the individual, ranging from education, health, communication skills, and mastery of technology.

The local government can also provide skills to productive workforce so that they do not depend on the availability of jobs, but will be able to create jobs which benefit other workers. On the other hand, the society should also support the development of human resources, value of awareness of the importance of education, health, and other aspects that can improve the quality of the individual. Basically, technopolis is expected to deliver innovative enterprise to provide undergraduate bachelors with jobs which will reduce the unemployment. The network between each element is expected to integrate with one another, so that the need for the implementation and development of technopolis can be maximized. Technopolis is integrated with multiple elements of technology and the public participation and businesses are needed in the development of technopolis. The absence of public participation and businesses will complicate the process of technopolis development.

#### 5. Conclusion

Technopolis concept is the result of consensus between academician, business and government and also social movement. Technopolis concept is a dimensionless area of economic development, social and cultural, which has a centre of science and technology activities,

productive activities and social movement working together to promote and support the accelerated development of innovation, diffusion and learning to increase competitiveness, especially in terms of economic regions. Technopolis concept is very flexible and adaptive that could be implemented based on the conditions and peculiarities of each region by integrating the elements of technopolis.

Demographic bonus and regional distinctiveness may be opportunities in the application and development of technopolis. This allows for each region to generate valuable products of different transactions between each other, so there will be no overlapping areas, rather complementarity between one and the other. The absence of a legal based governing and low commitment of implementing is faced as a challenge in the development of technopolis. In addition, it also needs human resource development and networking between technopolis, universities and industry for the encouragement of the public and businesses.

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