IMPLEMENTATION OF THE UNIVERSITY, INDUSTRY AND GOVERNMENT COLLABORATION STRATEGY ON BUILDING OPEN INNOVATION FOR PUBLIC SERVICES

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Abstract

To achieve open innovation within the framework of public services, universities, industry and government need to develop a collaboration strategy. There are many benefits of collaboration such as reduced costs, multidisciplinary, collaborator reputation and expertise. The problem of this research is how to implement a university-industry-government collaboration strategy to build open innovation for public services. Many factors interact and influence policy implementation as a dynamic process. The Triple Helix model which adopts a spiral (versus traditional linear) innovation model captures some of the interrelationships between institutional arrangements at different stages of knowledge capitalization. This study uses a qualitative approach to understand the social interaction among universities, industries and government. The data for this research was collected through the study of document study such as magazines and the internet (web) at five private universities in the top 100 clusters in Region 6 of Higher Education Service Institution (LLDIKTI), Central Java. The implementation of the collaboration

strategy of University, Industry and Government required greater commitment from the four main actors in the national innovation system. It is recommended that the government continue to develop the implementation of open innovation collaboration strategies for public services and foster the trust between universities and industry.

Keywords: Strategy, Collaboration, University-Industry-Government, Open Innovation, Public Services

Introduction

In today's increasingly competitive global environment, universities must be able to develop high-performance achievements, leading to innovative academic processes, meeting the demands of students and graduate users, especially the industrial world. In an effort to achieve open innovation within the framework of public services, for universities, industry and governments that currently do not have all the skills they need, the best way to meet these requirements is to build collaboration. Many benefits of collaboration can be obtained such as reduced costs, multidisciplinary, collaborator reputation, expertise, etc. (Draghici et al., 2015). Collaboration leads to a series of benefits that have a positive impact on open innovation and competitiveness, and university-industry collaboration is in great demand because of its high level of innovation (Guan & Zhao, 2013).

The collaboration for universities is considered very important because universities in Indonesia not only implement the Three Pillars of Higher Education; universities have not been able to excel if they are only teaching-oriented. The commitment of universities to improve the quality of education is not sufficient, because they are obsessed with becoming research universities, not learning universities. In contrast to education 4.0, its existence is due to RI-4.0. Education 4.0 is known as innovative learning

characterized by student-centeredness. This concept demands new skills, which is a vision of the future of Indonesian education. This approach not only develops knowledgeable graduates but is also able to create new mindset that responds to the challenges of change, increasing innovation in various aspects of life.

The Indonesian Minister of Education and Culture, Nadiem-Makarim, made a leap so as not to focus only on theoretical understanding but also to produce graduates who have applicative competence through the independent campus program, one of which is collaborative learning between university and industry as regulated in the Regulation of the Minister of Education and Culture (Permendikbud) No. 3 of 2020. Universities are an integral part of the supply chain of skills and innovation for business. However, it is not a simple linear supplier-buyer transaction, and not a single product/service acquisition, but is multidimensional, sustainable, quality and durable. These attributes can only be created through university-industry partnerships (Wilson, 2012).

Anatan (2008) in his study conducted in South Korea reveals that that education investment policies are a source of economic strength, which makes South Korea the sixth-largest exporting country in the world. South Korea's economic strength is supported by industrial competitiveness, which cannot be separated from the important role of government policies in integrating the education and industrial sectors through research integration and cooperation in all fields, especially the development of industrial technology capabilities. The scientists involved in the collaboration must be able to transfer knowledge and have a high commitment to the collaboration.

Paulin & Suneson (2011) define knowledge transfer at the individual level as to how the acquired knowledge is applied from one situation to

another situation. Knowledge transfer problem within the organization goes beyond the individual level and includes transfers with higher analysis.

Knowledge transfer from university to industry or vice versa has 4 categories: focusing on company issues (resource allocation and partnership); focusing on strategic issues (licenses, incentives for patents produced) and policy (intellectual property); focusing on localized spillover (university-industry relationship and its influence on the success of knowledge transfer); focusing on channel knowledge transfer (publications, patents, and consulting) (Agrawal, 2001). Strategic planning that is concentrated on cooperation is strategic planning that focuses on collaborative learning processes, partnership patterns and information systems related to communication and information distribution based on Cisco Enterprise, where the ultimate goal is to create a university collaboration strategic planning process so that the output produced is a strategic plan to optimize cooperation. The problem raised in this research is how the implementation of the university-industry-government collaboration strategy builds open innovation for public services.

Literature Review

Triple Helix Concept

Etzkowitz and Leydesdorff in 1995 introduced the Triple Helix model. In this model, the actor responsible for creating innovation is the industry and the actor responsible for creating knowledge is the university. These two actors interact and move with the third actor, namely the government. From this movement, Gibbons (1994) presents the characteristics of knowledge production in certain attributes, namely application, transdisciplinary, heterogeneity, hierarchy, transience, social accountability, and reflexivity. Universities lose the exclusive role of knowledge producers in favor of

mechanisms that are facilitated by interaction and rely on communication and network connections. The other way implies "an increase in the number of potential locations where knowledge can be created; sources of knowledge are no longer only universities and colleges but also non-university institutions, research centers, government agencies, industrial laboratories, consultants interact with each other that links all information through electronic, organizational, social, formal and informal communication through networking functions (Gibbons,1994).

Based on the same idea about the interaction between contributors to innovation, which is referred to as the institutional sector (Universities, Industry, and Government), Etzkowitz & Leydesdorff (1995) have developed a Triple Helix model that adopts a spiral (versus traditional linear) innovation model that captures multiple interrelationships between institutional arrangements (public, private and academic) at different stages of knowledge capitalization (Viale & Ghiglione, 1998). The new approach to interaction is characterized by: a) the key role of universities as key knowledge producers; b) the company's strategic mission in generating innovation through improving organizational processes and placing products and services on the market; c) important role of government in supporting the development of science-based technologies and in formulating policies targeted at innovation (Arnkil et al., 2010).

The implementation of the University-Industry-Government collaboration strategy as a scientific collaboration is defined from the point of view of the behavior or actions of two or more scientists to become facilitators in the process of developing, completing, and disseminating knowledge (Sonnenwald, 2006). Partnerships in the implementation of modern management are assumed to have an understanding of vision and

mission, an understanding of management and program development between institutions that are in synergy.

Therefore, among the partnering institutions, there must be a main actor of the partnership, as an institution that is responsible for the success of the program. Scientists involving in the collaboration must be able to provide additional knowledge and have a high commitment to collaborate. The strengths and weaknesses of each institution are used as the basis for the realization of the spirit of cooperation to share for the sake of complementing each other, assisting each other and achieving mutual benefit (mutualism). The partnership also has the principle of understanding between partners and must be enforced in its implementation which includes: the principle of participation, cooperation, openness (transparency), law enforcement (rights and obligations, leading to right-obligations, reward and punishment) and the principle of sustainability (Healy et al., 2014).

Differences in organizational culture between industry-university-government partners in the knowledge perspective, because of knowledge in the industry to develop products and services, but knowledge transfer does not occur, including intellectual property cannot focus (Draghici et al., 2015)

Table 1: Differences in organizational culture in universities, industry and government

No	University	Industry	Government
1.	Public Mission (Three Pillars of Higher Education)	Shareholder value	Public Service
2.	Curriculum policy	Need for skill	Facilitator/director

3.	Publication	Profit motive	Low work power
4.	Research	Practical research	Funding
5.	Theory development	Result trigger	Irregular working hours
6.	Knowledge creation	Capturing knowledge	Facilitating development
7.	Openness	Private resources	Political will
8.	Investigation requirement	Market needs	Educated workforce
9.	Education	Retain know-how	Labor skills
10.	Various resources	Private resources	Few workloads

Source: (Banal-Estañol & Macho -Stadler, 2010)

Over time, local governments have taken on the role of maintaining the necessary conditions to support innovation, especially conditions that support the critical mass concentration of intangible and tangible assets in their regions. While tangible assets relate to the intrinsic deposits of industry and university fields (e.g., sectoral specializations, applied research laboratories), intangible assets have more to do with interactive approaches to innovation among stakeholders. Concerning intangible assets, the literature places great emphasis on culture for innovation. In the model of regional innovation, culture and power are considered necessary for the interaction between research and innovation stakeholders such that the Triple Helix can be adopted as an operational approach to encourage innovation activities at the territorial level. It is highly functional for regions with relevant knowledge-based economies, innovation-driven industries and the presence of hybrid institutions. However, in regions where these necessary conditions are not

met, the application of Triple Helix may be less effective. This can happen especially in regions that are underperforming at the level of economic growth, less innovative space due to the dominance of traditional small and medium-sized businesses and/or knowledge space that does not take advantage of universities that focus on applied sciences.

This situation occurs because the Triple Helix model depends on the existence in the area of what is referred to as the technological paradigm generated by the interaction and exchange of (scientific/technical) knowledge within the Triple Helix environment (Arnkil et al., 2010). The technological paradigm is cyclically renewed; the innovation process consists of specific phases in which each plane of the Triple Helix changes its relative weight and role. For example, a form of government-industry collaboration may require support from entrepreneurial universities to encourage industry in its public service innovation efforts. In the early growth phase of the technology paradigm, the role of both universities and government was reduced to industrial players. As the existing technological paradigm reached its maturity, universities and government began to play a leadership role in proposing a new technological paradigm and began to lay the foundation for a new wave of innovation.

This model was formed because the university underwent a revolution, namely when a university that had only acted as an educational or teaching institution (teaching university) turned into a research university. The driving factor for this research activity is because universities want to make research activities a medium to find scientific truth from various knowledge produced by students and lecturers. Leydesdorff further states that the emergence of the Triple Helix model was due to several world developments occurring simultaneously. First, the increasingly strong interconnection between knowledge-producing institutions and knowledge users. This is indicated by a

large number of industrialists and scientists working together to prioritize the research to be carried out, resulting in the transfer of knowledge and technology as a result of knowledge production from scientists working in universities to industry. Second, the increasingly massive development of information and communication technology makes knowledge easy to obtain from any source. Third, the growth and development of information and communication technology have a logical consequence of a change in the form of coordination among universities, government, and industry from vertical to the lateral relationship which reduces the complexity of the bureaucracy, so that over time the three parties become more cohesive.

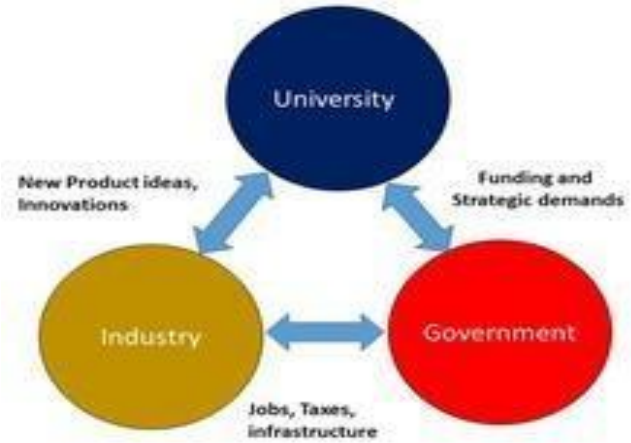

Figure 1. The Triple Helix Model A

A university is a research institution, thus in the industrial cycle (making products according to market needs), universities can portray themselves as components that carry out research and development (the product). To set up a research institution requires expensive costs, whereas almost all industries in Indonesia are not equipped with research institutions; universities must position themselves as industrial research institutions known as the RAPID policy (Research Mainstay of Higher Education and Industry).

Knowledge of Public Service and Policy Implementation

Edward (1980) argues that policy implementation is a step for policymakers on a predetermined policy, which is influenced by the variables of communication, resources, disposition and bureaucratic structure and the consequences of that policy on influencing people. The main problem of public administration is the lack of attention to the policymakers' decisions that are not carried out successfully. To deal with an increasingly complex and dynamic environment, the innovation process must involve users/consumers/communities as the main contributors (Ivanova, 2014). The desire of consumers/community is the source of the emergence of creative and innovative ideas. The community must be incorporated into the innovation system and become a part that must be paid more attention to (Carayannis & Campbell, 2012). This concept is often referred to as ABGC collaboration (academicians – business – government – community) or quadruple helix (see Figure 4).

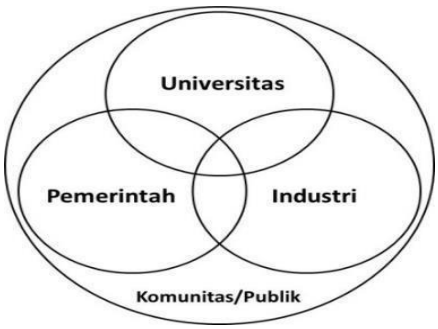

Figure 4. The Triple Helix Model in the Consumer/Community Space

Source: (Ivanova, 2014)

Products from public service delivery must have at least three indicators, namely responsiveness, responsibility and accountability.

a. Responsiveness refers to the responses of the service providers to the expectation, desire, aspiration and demand of service users.

b. Responsibility is a measure of how far the process of providing public services is carried out in accordance with correct and established principles or provisions of administration and organization.

c. Accountability is a measure of showing how big the service delivery has been done in accordance with the interests of stakeholders and the norms that develop in society.

Development of Public Service Model

Table 1 Paradigm Shift of Public Service Model

Aspects	Old Public Administration	New Public Administration	New Public Service
Theoretical Basis	Political Theory	Economic Theory	Democratic Theory
The concept of public interest	Public interest is politically defined and stated in the regulations.	Public interest represents the aggregation of individual interests	The public interest is the result of a dialogue of various values
To whom is the public bureaucracy responsible?	Clients and Voters	Customers	Citizens
The role of government	Routing	Directing (steering)	Negotiating and elaborating the interests of citizens
Accountability	According to administrative hierarchy	Market demand is the result of the customers' desire	Multi aspects are accountable to the law, community values, political norms, professional standards and citizen interests.

Source: (Denhardt & Denhardt, 2000).

In the new public service model, public service is based on the democratic theory that maintains egalitarian and equal rights of citizens in the administration of public services. In this model, the public interest is formulated as a result of a dialogue about various values in people's lives. Various forms of public interest are not only formulated by political elites as stated in various regulations. In this model, the bureaucracy that provides public services to the community must be responsible to the community.

Method

This study uses a qualitative approach with the emphasis on revealing and understanding the hidden meaning of data, understanding social interaction, university, industry and government to develop the theory and ensuring the correctness of the data in a collaboration model. The data were collected through in-depth interviews from informants (universities, industry and government which were determined based on purposive sampling. The main data of this study was obtained through the identification of discourses from national and international journal articles, national education system laws, and the web (internet). By collecting data through books, documents, internet (web) magazines, in addition to conducting in-depth interviews with 5 (five) private universities included in the top 100 clusters in Region 6 of LLDIKTI, Central Java.

Data analysis was conducted through data reduction, data display and conclusion drawing/verification. It aimed to find and build an understanding of the workflow and obtained data accurately, precisely and empirically. The analysis used was qualitative data analysis. (Kawulich, 2015) explains that qualitative analysis is closely related to data collection methods, namely observation and in-depth interviews. The result of qualitative data research is a theory that explains the phenomenon being studied. The research report is usually a narrative discussion of the research process and findings.

Result

Implementation of the University, Industry, Government collaboration strategy with the Triple Helix Model has resulted in various open innovations for public services at 5 universities in Region 6 of LLDIKTI as follows:

a. Semarang University (USM) in Semarang City, Central Java, has an Information System, especially in the Faculty of Information and Communication Technology (FTIK) and has built web-based applications for partners and entrepreneurs of Micro, Small and Medium-sized Businesses and made it easier to collect data. Several business actors who become USM's partners are Kopi Tarik Ungaran, BMS Majapahit Clinic, cooperatives, car repair shops, and so on. This project could translate the users' needs and the business processes into a web-based program to do system analysis, design and implementation and to determine the partners who would later develop a web application. It was expected that the web application that was built would help partners in the operational process. Several partners claimed to be helped by the applications. Likewise, through community service programs, we tried to provide skills for the Micro Small and Medium-sized Business (UMKM) actors who were the members of the Go Food Community Partner through the ability to process culinary photography or food photography using a smartphone camera.

b. Satya Wacana Christian University (SWCU) in Salatiga, Central Java, has made a transition to a research orientation marked by the increased commitment and publication performance. The activity domains included Intellectual Property Rights (IPR) centers, technology and business incubators and science parks. Technological innovations that currently supported the use and commercialization of appropriate technology innovations as business incubators were different from other incubators because of their focus on appropriate technology. SWCU also managed and developed tourism products for destination managers to focus not only on the economic sector but also on sustainability and community-based products. Thus, innovation on research results is an effort to develop products/services/systems that have novel value and are of direct benefit to improving people's quality of life.

c. Dian Nuswantoro University (UDINUS) developing Robotics innovation and Agromaritime 4.0 technology made an MoU with the Bogor Institute of Agriculture (IPB) to make robotic

technology innovations that could be useful in the future. This innovation complements various technological innovations created by UDINUS such as gamelan (a traditional instrumental ensemble of Indonesia) robots, sterilization robots and other types of robots. This is a form of accelerated education in Indonesia, especially in the field of technology and robotics. This collaboration is a challenge for UDINUS to continue growing and contributing to Indonesia. The Entrepreneurship Center was also developed as a business incubator whose activities include coordinating entrepreneurship courses, holding Student Expos, Creative Competitions, becoming Entrepreneur Tent Coordinator, and making business proposals. It is intended that the more competition that is carried out in the field of entrepreneurship, students are increasingly challenged to make innovations. This challenge has proven that four students of UDINUS Semarang have created a smart device to detect diabetes mellitus that does not cause pain and can be connected to a smartphone.

d. Soegijapranata Catholic University in Semarang City develops open innovation through 14 (fourteen) digital products such as Digital Attendance with QR Code, application for lecture attendance, CyberLearning with various features such as auto-registration, attendance, plagiarism check, live streaming, and scoreboard study activity. These innovations make online lectures even more interesting; Graduation registration is done in one step only; unlimited online legalization through the verifikasi.unika.ac.id site. Verification of certificates and academic transcripts can be done online by scanning with the QR application to see the validity of the legalized certificates and transcripts. Lecture Health Dashboard is also developed; collaborative electronic book writing is accommodated with the e-book platform through the ebook.unika.ac.id platform. In addition, a Job Fair Application from the Career Center and Digital Entrepreneurship Platform is also prepared. Since 2014, the Business Incubator has been transformed into an Entrepreneurship Center (EC) which focuses more on establishing and enhancing an entrepreneurial atmosphere among students and the entire academic community. In developing

entrepreneurship, EC organizes mentoring activities, consultations and seminars in the context of developing students' entrepreneurial abilities.

e. Sultan Agung Islamic University Semarang (Unissula) launched the Innovation Center and Business Incubator (Punovkubis), with the main task of carrying out activities in order to improve and prepare for the growth and development of profitable companies. Punovkubis is still in the early stages of development, which in this first year is expected to focus on the creative industry and information technology, which prioritizes tenants from lecturers or Unissula students. In the future, Punovkubis Unissula will become an intermediary from innovation-based companies to become a competitive company. The resulting innovation product is smart technology, Indonesia free of cavities, named Mimoya (Solar portable micromotor – wireless fidelity), the work of students from the Faculty of Dentistry and the Faculty of Industrial Technology, Unissula.

The implementation of the University-Industry-Government collaboration strategy from the 5 universities above was analyzed from 4 (four) implementation variables; it is still necessary to develop indicators of transmission through several levels of bureaucracy to street-level bureaucrats to avoid distortion and bias. The implementation of the university-industry-government collaboration strategy is still in a different perspective from each collaboration actor.

University Perspective

From the university's point of view, there are four main characteristics in the decision to manage the implementation of collaboration strategies with industry, namely: 1) Universities tend to cooperate with companies that invest more in research and development (R&D) and human resources who have high commitment and dedication in implementing these tasks so that through this collaboration both parties can share experiences in terms of habits, communication, ways of working, and organizational culture, 2) Universities are not very familiar with the job market and industrial work culture, in the sense that universities do not fully understand the existing regulations in the market, 3) the mechanism for disseminating technological

offerings and scientific research results is not understood. Universities must harmonize the dissemination of their scientific research results due to the lack of clear distribution channels and mechanisms, 4) Universities find it difficult to inform, explain, and convey to the industry what the university has done and how the research results can be implemented by industry.

Industry Perspective

From an industry perspective, two important things can be identified: 1) the difficulty of positioning technology for competitive advantage factors to adopt a strategy based on intangible factors or technology. Investment in intangible factors such as product quality, delivery time, marketing access and direct access to consumers is not easily accepted and recognized by the industry as a fundamental tool to compete, 2) The industries tend to think that research and technology development activities carried out in universities are too developed or sophisticated and are used specifically to solve practical problems (Daghfous, 2004). They argue that academics are less reliable and cannot be trusted that academics can develop effective solutions.

To overcome this, a knowledge transfer mechanism from universities to industries is needed in the implementation of university and industry collaboration strategies that are carried out to achieve the goal of knowledge transfer from universities to industries. Several mechanisms of knowledge transfer from universities to industries include (Siegel et al., 2003) collegial interchange by conducting seminars and publications. This activity is informal in which there is an exchange of information between universities and industries through presentations in seminars, publication of articles through scientific journals and scientific magazines. This collaboration is the first step in the collaborative policy between universities, especially their research centers, and the industrial sector.

Consultation and provision of technical services are other forms of cooperation. This type of cooperation emphasizes one or more of the universities or research centers that are responsible for providing advice, information, and technical services to the industrial sector. This cooperation is legalized in a written contract which is generally carried out in the short

term and is specific in nature. To support the collaboration, academics or senior researchers need to be involved to provide consulting services with outside parties.

Advisory committee is a committee that consists of teaching staff and practitioners to examine the curriculum in detail to assist student placement in the industrial sector after they graduate, assist faculty development, and provide various evaluation feedbacks. University center or industrial liaisons unit is a unit specially formed to manage cooperation and create synergies between universities and industries. The forms of cooperation are divided as follows (Camarinha-matos, 2010):

a. The management of foundation: This form of collaboration indicates the commitment and involvement of practitioners to improve the quality of management of both parties.
b. Exchange program: This program emphasizes the exchange of experts and information either from industry to university or vice versa. In the mechanism, the possibility of conflict must be avoided.
c. Joint venture research and development program: in this collaboration, a working contract is made between the university (research center) and industry (company). The two parties cooperate from the research and development stage to the commercialization process.
d. Research and development cooperation agreement: This form of cooperation is an agreement between one or more universities (research centers) and companies in which the universities provided human resources, facilities or other resources, with or without compensation for services. Industries provide funds, human resources, services, facilities, equipment, and other resources to facilitate specific research or development efforts consistent with the university's mission.
e. License: License is the transfer of ownership rights in intellectual property to a third party to grant permission for third parties to use existing intellectual property.
f. Research contract: a research contract is entered into between a research center within a university and a company to enter into a

research and development agreement to be carried out by a research center or university. Undergoing contract research, the industries want to use the special capabilities of the researcher to gain a commercial advantage.

The Government's Perspective

Governance of collaborative strategy implementation is the importance of learning and evaluation. Collaborative governance aims to promote mutual understanding and consensus (Ansell & Gash, 2008). Many partner-based initiatives fulfill their collaborative goals through information sharing. Collaborative governance requires stakeholders to work together on all aspects of policy development and management from problem definition and planning to implementation and assessment. This condition will be possible if supported by strong leadership (Notar et al., 2008). However, in this case, it is not just any leadership style that can be applied. Those who lead must have more complex talents and skills than those who lead top-down entities (Page 2010). Facilitative leadership contains different duties and obligations (Bussu & Bartels, 2011). Facilitative leaders are primarily concerned with building and maintaining relationships.

Leaders in the context of implementing a collaborative strategy focus on recruiting the right representatives, helping to restore tensions that may exist among partners, promoting effective dialogue and mutual respect among stakeholders and maintaining a collaborative reputation among participants and supporters. The task of the facilitative leaders is to maintain the legitimacy and credibility of the collaboration among partners. The facilitative leaders must help partners not only to design strategies to achieve substantive consensus but also to identify how to manage collaboratively. Their important role is to be able to clarify, build transparency and develop sustainable strategies for evaluating and resolving discrepancies among stakeholders (Page, 2010). In a collaborative governance perspective, the selection of leadership must be appropriate, which helps directly establishing the collaboration in a way that will maintain the horizontal structure of governance, while encouraging the good relationship and forming many ideas of collaboration.

University-Industry Cooperation

The decision to implement a collaborative strategy from the university side is motivated by several reasons, namely: legal recognition of intellectual property rights, receipt of royalties for intellectual services and ideas, publication and well-reputation on behalf of the university, the process of satisfying technology dissemination with the ideas developed by scientists, and financial support for the funding of research carried out by the university.

Industries choose different ways to access the technology they need. The most common, fast, and convenient thing is to buy technology, but this will not provide a competitive advantage because the same technology can be bought by all companies if they have the financial ability. Another approach is through technology development to invest in a high level of development risk. It is not surprising that the number of companies producing their own technology is still very low. Another alternative is outsourcing from third parties and participating in technology development projects such as companies and educational institutions. Outsourcing requires a clear perception of technology needs that can be translated into specific needs.

Involvement in collaborative research projects with other parties, especially universities, is a promising approach for companies to create competitive advantages through competency differentiation, cost and risk sharing to strengthen the relationship between the two parties. As a result, the relationship between university and industry becomes a satisfactory tool to achieve competitive advantage.

Collaboration that will be carried out, in the future, by universities is advised to refer to the typology as stated by Bammer (2008) below:

a. Research cooperation, including basic and applied research
b. Joint development of initiatives to strengthen the employability of graduates
c. Curricular cooperation through joint study programs
d. Internships in companies and trainee programs during and after graduation
e. Funding of chairs/professorships by industry
f. Private universities funded by industry and the public sector

g. Common activities to raise students-interest in more applied and/or technology-oriented HE programs.

The other scholars like Carayannis & Campbell (2012) conclude that collaboration between universities and industries is important to increase the limited budget for the academy to encourage and motivate academics to seek funding including through research and development for and with industries, and also to increase the importance of knowledge in an industrial environment that increases the value of academic knowledge.

Implementation of University and Industry Collaborative Strategies

Universities and industries are two institutions that operate in different fields and have different goals and visions. These two institutions might be separated, good collaboration of which would produce benefits not only for both parties but also for national economic growth. This is the reason why both are referred to as higher education institutions that transfer the right knowledge and expertise for graduates to be absorbed in the industrial world so that they can make a real contribution to the development of the industries which will automatically have an impact on national economic growth (Mattoon, 2006). To achieve this goal, the main thing that must be done is to close the gap between universities and industries by creating a knowledge transfer process through collaboration between universities and industries. Through this collaboration, both parties are expected to be able to invest in the development of research capabilities carried out by universities and industries that are focused on the research areas of both parties. Both of them can find the best solution to the problems faced by the industrial world through research collaboration to improve company performance. This collaboration will ultimately have a good impact on national economic growth.

The thing to think about is how to build a knowledge-based industry. Creating an industry like this requires innovation that can be achieved through collaboration between industries and universities. Universities as higher education can provide an increase in the knowledge-based economy through mutually beneficial cooperation with industries. The impact is expected to be felt by the community through small and medium-sized industries.

Conclusion

Based on interactive analysis of the business collaboration of 5 (five) universities in Region 6 of LLDIKTI, Central Java, it can be concluded that the implementation of the collaboration strategy of University, Industry and Government is still in different perspectives; thus, a greater commitment in the national innovation system is badly needed from the three main actors, namely the government, universities, and industries for the benefit of public services to all communities in society. The collaboration between these three actors will result in the implementation of a collaborative strategy to increase open innovation on public services and public welfare.

Recommendation

In general, the recommendation for the government is to continue to grow the trust of the private sector. The strategic steps that need to be taken are to:

a. establish a national forum that includes relevant leaders from government, industries and universities to build agreements;
b. develop public investment and consistent policies to support the vision of economic growth by implementing a collaborative strategy to build open innovation, not only in ensuring the autonomy of each institution but also affirmatively supporting the development of industries that have high values;
c. develop the implementation of collaborative strategies to build open innovation for public services and increase investment in research and development at universities and industries sponsored by the government.

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