



# PROCEEDINGS

## Indonesian High Education Institution Strategy in Facing the Industrial Revolution 4.0



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International Joint Seminar

**‘Indonesian High Education Institution Strategy in Facing the Industrial Revolution 4.0’**

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## **WELCOMING REMARK**

### **Universitat Internacional de Catalunya**

First of all, I would like to express my most warm welcome to all authors

for their valuable work, time and dedication so we can have one full proceeding that is so rich of research contributions. I myself would like to see the proceeding as an interesting window to see research works from Asia, especially from Indonesia. Hopefully this proceeding book can serve as a memento and encouragement for the advancement of further research in the future and enhance and foster collaborations among scientific at international scale.

I wish all participants good luck and have a nice and fruitful conference. Last but not least, welcome and enjoy Barcelona!

**Frederic Marimon**

**Full Professor in Business Administration**

**Vice-Rector of Planning and Quality**

**Universitat Internacional de Catalunya**

**OPENING REMARK  
HEAD OF LL-DIKTI REGION IV**

Thanks to the grace of God Almighty (Allah SWT), alhamdulillah, the International Proceedings at the Universitat Internacional de Catalunya (UIC), Barcelona, Catalunya, Spain, is complete. We organize this seminar on November 11, 2019 with participants and speakers from Indonesia, Spain, Switzerland, India, Palestine and United Kingdom. With the theme: "The Role of Higher Education in Facing the 4.0 Industrial Revolution in Indonesia", we aim that the seminar participants gain and share knowledge and experience among the participants and speakers present at the event.

Most of the Human Resources (HR) in Indonesia do not fully understand how the 4.0 industry has started to appear rapidly at this time, in the joints of the Indonesian economy. The low understanding of human resources in Indonesia goes straight with the emergence of inequality between the capabilities of local human resources and foreign human resources that began to participate in the current 4.0 industrial revolution in Indonesia. In addition, there are not many formal educations specifically preparing human resources in this field. Efforts that can be made by tertiary institutions to enhance their role are that special courses need to be made on Information and Communication Technology (ICT). If it already exists, then it needs to be deepened to be able to better understand the development of new technologies such as the Internet of Things (IoT), artificial intelligence machines or artificial intelligence (AI), physical-cyber systems and cloud computing.

With the issuance of international proceedings, I would especially like to thank Mr. Mahir Pradana who has worked hard to facilitate seminar activities with UIC Barcelona. Our deepest gratitude also goes to UIC vice rector of Planning and Quality, Prof. Frederic Marimon, for having our participants in his remarkable university. Hopefully these activities can provide us motivation to always work and innovate in developing professionalism as lecturers.

Bandung, 5 November 2019

**Head of LLDIKTI Region IV,**

**Prof. DR. Uman Suherman AS, M.Pd.**

**OPENING REMARK  
CHAIRMAN OF Korpri LLDIKTI Region IV**

Thanks to the grace and sanctity of God Almighty, the international proceedings published by the Universitat Internacional de Catalunya (UIC), Barcelona, Catalunya, Spain, can be resolved in a timely manner. Also, with good cooperation between our personnel Mr. Mahir Pradana, UIC, the speakers, and participants from Indonesia, and several countries in Asia and Europe. Hopefully this proceeding can provide motivation for lecturers to develop Higher Education 'Tridharma', especially aspects in lecturer research.

The development of technology in the industrial revolution era 4.0 is very influential on the characteristics of jobs that exist today, where skills and competencies are the main things that need attention. Because in the era of the industrial revolution 4.0 the integration of the use of technology and the internet is so sophisticated and massive that it also greatly influences changes in the behavior of the business and industrial world, the behavior of society and consumers in general. Characteristics in the industrial revolution era include digitalization, optimization and customization of production, automation and adaptation, interaction between humans and machines, value added services and business, automatic data exchange and communication of information technology. Therefore, education and industry must be able to develop industrial transformation strategies by considering the human resource sector that has competence in their fields.

In facing the era of the industrial revolution 4.0, students are expected to have 4 (four) competencies in themselves, including: competence to interact with various cultures, social skills, new literacy (data, human technology) and lifelong learning (lifelong education)

Hopefully the international proceedings issued by the University of Internationale de Catalunya (UIC) Barcelona can make useful contributions, especially for lecturers in developing the Tridharma of Higher Education.

Bandung, 5 November 2019

**Prof. DR. Endang Komara, M.Sc**

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# **SOCIAL CHANGE ON THE REVOLUTION 4.0 ERA IN HIGHER EDUCATION**

I. S. Iriany, Rostina Pasciana, S.S., M.Si, and Dr. Mulyaningsih, M.Si  
Postgraduate and Faculty of Social and Political Sciences,  
University of Garut  
Jl. Cimanuk No, 285 A Garut 44151  
sartikaieke@gmail.com

## **Abstract**

Industrial Revolution 4.0; demanding socio-cultural changes and social engineering, the obvious challenge for private higher education institutions is how to respond to actual conditions by developing human resources, to achieve national education goals. On one hand, globalization must be carried out, on the other hand it is demanded to maintain the local values that show national identity. The main problem in this study is how is social change in higher education in facing the challenges of the industrial revolution 4.0? This research used a qualitative approach with survey-descriptive methods, and interview, observation and documentation techniques. Informants were determined purposively with the total number of 18 people, located in 5 Private Universities in Garut Regency. Data analysis conducted through the stages of reduction, display, analysis and conclusion. The qualitative approach lies in the results of descriptive and practical surveys. Most approaches were carried out through cultural change and modernization based on the needs and possibilities that apply (A.Hadita: 2015) Theory used: the theory of social change (Rogers: 1984). The results showed that social change in private higher education institutions was determined by various factors, including the development of the global environment and the demands to maintain the value of local wisdom, in improving human resources.

**Keywords:** Social Change, Revolution 4.0, Higher Education

## **1. INTRODUCTION**

Social changes in modern society that continue to develop as predicted by Alvin Toffler in some of his works including *Future Shock* (1984) and *The Third Wave* (1980). Toffler explains the first period is farming and the second period: industrialization, is a form of change to the social conditions of society that are very dependent on the human beings themselves with machine to support their activities in society. The third period of the information age; according to Toffler is a very complex period, the machine is not replaced entirely but gain added value knowledge.

The fourth phase of the industrial revolution history began in the 18th century. The 4.0 industrial revolution offers an offer that can help improving the welfare of society in general. Experts also argue that the 4.0 Industrial Revolution will be able to help increasing the average of income per-capital in the world, extend the life span of humans and even improve the people's quality of life. This requires changes and strengthening competencies. In this context, some of the competencies needed include the ability to solve problems, the ability to adapt, collaboration, leadership, creativity, and innovation. Thus, universities need to develop a pattern in order to answer these needs in order to strengthen competitiveness and universities further strengthen their position as industrial partners and the business world where they can manage reliable Human Resources.

Some features of the industrial revolution 4.0 era are the characteristics of automation and digital economy. The development of super-computers, robots, artificial intelligence, and genetic modification has resulted in shifting trends in the workforce that is dependent on machines. A 2016 McKinsey study (<http://www.Mdp.Ac.id/article/mckinsey-five-facts-indonesia-can-be-developed-in-2030>, downloaded on 30 September 2019, at 21.31) states that five years in the future 52.6 million jobs will be replaced by machines. This follows a global trend where 60 percent of jobs will adopt an automation system, and 30 percent will use digital technology. What efforts did universities do to face the challenges and opportunities of the industrial revolution 4.0?

The university should ideally respond immediately to employment problems in the industrial revolution 4.0 era, by changing and redesigning the curriculum. with a digital human approach, towards transformation of skills on the basis of Communication Information Technology. The presence of the Industrial Revolution 4.0 will have a major impact on the lives of people wherever they are. These

changes will appear in the cultural sector, lifestyle, mindset, work patterns, and institutional systems in any institution.

The readiness of human resources in various sectors is the right answer in welcoming the 4.0 Industrial Revolution by changing the way of work and output of work becomes a change in this era. For those who still have not been ready, of course they will be left behind and do not have the ability to compete in their best performance. The 4.0 Industrial Revolution has provided interesting challenges while providing opportunities to create new ways, new systems and new cultures in the life of society, nation and state.

The answer to the challenges that are attractive to college graduates is being responsive, having an entrepreneurial spirit, and improving the quality of graduates. Indicator of higher education is quality. The development of higher education should be directed at strengthening quality improvement to answer the needs of the Industrial Revolution 4.0.

University leaders who are alert and energetic, brave to make breakthroughs, quickly and correct in making decision are needed. This strategy is very appropriate to be implemented by universities to respond the existing challenges. The digital generation is required to have the ability to change cultures and work patterns dramatically. If the strategic steps are implemented properly, universities will easily achieve the expected goals. The Industrial Revolution 4.0 also opened positive opportunities for the nation's generation.

The current socio-cultural change is not only in the technology sector, but has expanded in other fields such as government, such as the expansion of management information systems created to improve services to the public, so that the government can effectively carry out the role of bureaucracy efficiently based on e-governance. In the political field as well as in political activities to gather time with social media-based activities. And the change that is very worrying is the change in the social field. The industrial revolution has changed the world order rapidly. This change no longer takes thousands of years, as explained by Charles Darwin's theory of evolution (Darwin, 2004) in *On the Origin of Species*. Changes that only require a very short time. In this fast-paced situation, what changes is not just a phenomenon, for example offline to online, the real world becomes a virtual world, print media becomes social media, and so forth. However, values, social order, and culture also experience changes.

In line with social changes that occur in Indonesian society, the main problem in this study is how social change in higher education in facing the challenges of the industrial revolution 4.0? 4.0 From the main problem, then identified as follows: (1) How is the change in student lifestyle ?, (2) How to improve lecturer skills? (3) What do private universities need to prepare? Hence the purpose of this research is to find a way to overcome the changes in the lifestyle of students, to illustrate how to improve the skills of lecturers and to find out and explain the preparation of private universities in facing the challenges of the industrial revolution 4.0.

## **2. LITERATURE REVIEW**

Communities wherever they are never stop experiencing socio-cultural changes. Socio-cultural changes are characterized by symptoms of changing social structures and cultural patterns in a society. Socio-cultural change is a common phenomenon that occurs throughout time in every society. The change occurs in accordance with the nature and nature of human beings who always want to make changes. Likewise, higher education as one part of the community group, is always experiencing changes.

Focus Theory Structural functionalism emphasizes order and ignores conflict and change in society. The main concepts are: function, dysfunction, latent function, manifest function, and equilibrium. This theory states the community as a social system consisting of interrelated parts and united in balance. Changes that occur in one section will also bring changes to other parts. Adherents of this theory tend to look only at one system or event against another system and therefore ignore the possibility that an event or a system can oppose other functions in a social system. Adherents of this theory extremely assume that all events and all structures are functional for a society. So if there is a

conflict, adherents of structural functionalism theory pay attention to the problem of how to solve it so that the community remains in balance.

In the case of the industrial revolution 4.0, it will influence changes in behavior, mindset and patterns of action in the tertiary community, both students, lecturers, or academic supporters globally. Revolution is a change from social or cultural that takes place quickly and involves the main points of the foundation or life of society. In a revolution, changes can be planned or not planned in advance and can be implemented without violence or through violence. The size of the change in relative speed due to the revolution can also take a long time.

Changes in University Paradigm (Dikti and ITS: 2018) are;

PARADIGMA LAMA	PARADIGMA KE DEPAN
Mencari Pekerjaan	Menciptakan Pekerjaan
Fokus pada pendidikan	Akademik + Riset + Inovasi + Vokasi + Profesi
Fokus pada input	Fokus pada outcome
Dana tergantung pada pemerintah	Tanggung jawab dibagi kepada pemangku kepentingan
Tersentralisasi	Otonomi
Bersifat "Produksi Masal"	Inovasi berbasis teknologi
Akademik dan Riset	Akademik + Riset + Karakter + Ahlak + Inovasi
Course Based	Berbasi riset untuk penciptaan inovasi
Pendidikan di kelas	Pendidikan lebih fleksibel berbasis IT

Rogers (1985), argues that a theory of change must summarize the following main questions:

1. What factors experienced the change. 2. The extent to which the change occurred. 3. How the speed of change is going on. 4. What conditions exist before and after the change occurs. 5. What happened during that transition. 6. What stimuli that drive the change. 7. Through the mechanism of whether the change occurred. 8. What elements cause stability at a certain point in the change. 9. Can humans determine the direction of the change.

### 3. RESEARCH METHOD

The research method used in this study was a survey research method with a descriptive-qualitative approach. Data collection techniques used were structured interview guidelines and observations as well as studies of secondary data / documentation studies.

The informants in this study were 18 academicians, from 5 Universities in Garut Regency which has a minimum student body of 1500 students. Data analysis was carried out in a qualitative verbalistic manner through the stages of reduction, display, analysis and conclusion drawing.

### 4. FINDING AND DISCUSSION

#### 1. Changes in student lifestyle

In the research location there were 5 higher education institutions under the Directorate of Higher Education and 5 higher education institutions under the Department of Religion, with varying amounts, between 1000 to 6000 students affected by digital lifestyle.

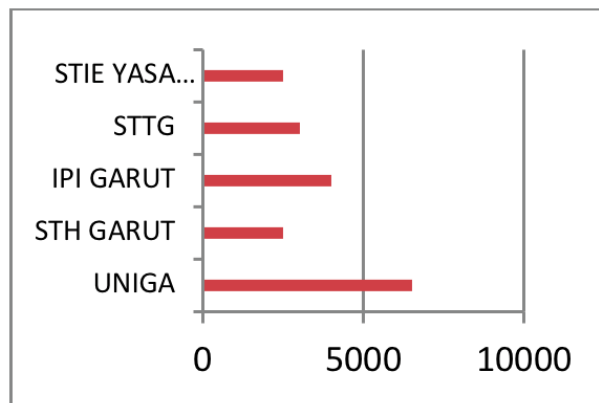


Figure 1: Data of 5 Universities and Number of Students (LLDIKTI 4)

In Figure 1, it is known that the most students are at the University of Garut (6500 students). The digital lifestyle is a phenomenon for millennial society today. This explains that the digital lifestyle is a lifestyle revolution (even a living culture) due to the rapid development of information and communication technology. By using digital equipment, work can be done more efficiently in the sense of saving costs and also time, can be more effective because the work objectives can be achieved faster than before. Experts say that the main purpose of a digital lifestyle is the optimization of productivity by using various tools of the benefits of information technology.

The absorption capacity of the community towards global culture is faster than the absorption of the local culture. Real proof of the influence of globalization, among others, on the dress style, language style, information technology and communication.

Lifestyle which is standardization and modernization that leads to the process of killing tradition must be resisted, because it means the elimination of the source of local identity begins with a local identity crisis.

Is it possible that regional / local culture, such as Sundanese culture and other Indonesian cultures, will be crushed to extinction by globalization and abandoned by its supporters?

In this era of globalization there is a motto "think globally act locally" which means to think globally but still act in accordance with the culture where it is located, so that someone is not carried away by the wind of improvement that can sometimes be misleading. Local wisdom is an action that someone should act and carry out all activities as a form of culture that has been embedded long ago.

The decline in social sense and the spirit of diversity that leads to the disintegration of the nation and the violation of the law as well as the lifestyle of individualism and consumerism that contradicts a simple lifestyle and all of that contradicts the original cultural values of the Indonesian nation which were excavated from Pancasila.

To describe what changes have occurred in the mindset, action patterns and students' behavior in the era of the industrial revolution 4.0, we can see table 1 presented below:

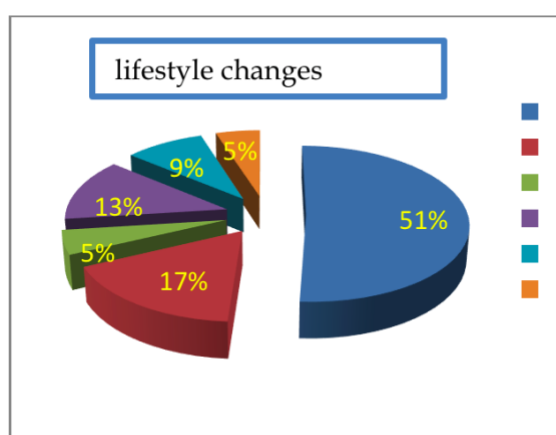
**Table 1 Types of Lifestyle Changes**

No	lifestyle	%
1.	The lifestyle of the student become digital	51%
2.	Increased use of the Internet	17%

3.	Internet to find information about goods	5%
4.	e-commerce, transportation	13%
5.	e-money usage	9%
6.	e-toll usage	5%
total		100

Source: research findings

Or as presented in figure 2 as follows:



Students as millennials, of course, their lifestyle becomes digital, starting from accessing the academic system, doing assignments based on Google classroom, searching for data and shopping online, and other activities, so that the majority states as illustrated from the percentages above, then consistent with these needs, there is an increase in internet use, so naturally students are more comfortable on campus to get a Wifi network and discuss through social networks. The industrial revolution 4.0 needs to be answered by increasing competency, especially mastery of computer technology, communication skills, the ability to cooperate collaboratively, and the ability to continue to learn and be adaptive to environmental changes.

This is where the role of students is not only as a connoisseur of easy access in this modern era but also as responder to an industrial revolution. Students can get benefit from the digitalization of the economy today, but only if they prepare well enough. To anticipate the industrial revolution 4.0, it is important to: Increase the competitiveness of human resources, that now no longer competing with fellow Indonesians but also competing with other foreign talents. It is everyone's responsibility as the next generation of Indonesia to equip himself with competitive talent through competitive education programs. Maintaining entrepreneurship in Indonesia, this was proven during the crisis that occurred a few years ago. The Indonesian business sector which is filled with productive activities can maintain economic stability. On top of that, it will also open up job opportunities for local talent.

Students must also push the reformation in the bureaucracy, this is very important because in the end it will increase social and economic differences. This is also the movement needed to create a solid foundation of economic stability facing free trade and AEC. By entering the 4.0 industrial revolution, competition will be at a different level than before. As Indonesian youth, it is our responsibility to

contribute the best we can. Because no one else will defend the Indonesian economy. No one else will enjoy the benefits of economic growth.

Students in their work to become important instruments in practicing the Higher Education of Tri Dharma, which are as educators and lecturers, research and development as well as community service. In terms of research and development, students have the responsibility of finding opportunities for middle and lower society in developing their economy in the Industrial Revolution Era 4.0 by conducting research related to solutions in improving popular economy and developing main ideas that benefit the democratic economy. As an Agent of Change, a student is required to play an active role in community service, by going directly to the field and changing the consumptive mindset to be productive in economic activities. In the end, currently the community needs the role of students to maintain the stability of the middle to lower economy in this "all-machine" era.

Students must return to their true identity who are able to become Agents of Change, Agents Of Analysts and Agents Of Control so that they are maximized in achieving the ideals of the nation that is to advance public welfare, educate the life of the nation and liberate the Indonesian people from all things in life . Of course, these ideals will be realized, if the lecturers and students are able to integrate the activities of thinking, processing, and exercising based on religious value, nationalistic value, intelligence value, resilient value, independent value, honesty, and integrity activities that concern the environment. (Dikti-ITS, 2018).

## *2. The Efforts of Improving Lecturer's Skill*

The revolution of industry 4.0 provides not only opportunities, but also challenges for millennials. This is due to there are nowadays many opportunities supported by sophisticated technology that can easily facilitate all sectors of life. The online system makes services faster and more efficient and has wider range of connections. Digital technology support certainly results in simplicity and innovation obtained. However, this phenomena has caused challenges for the society who cannot keep it up with the rapid development of technology. Consequently, the digitization also leads to negative impacts. The role of human is gradually taken over by automatic machines.

As a result, the number of unemployment and poverty has increased. This is due to the people's work is replaced by technology. The other impact is that the production process is faster and easier to distribute massively with minimal human involvement. Thus, the industrial revolution could have an impact on increasing unemployment in Indonesia. However, the fields of work related to Computer, Mathematics, Architecture and Engineering expertise will be increasingly needed. These areas of expertise are projected according to the demands of work that rely on digital technology.

As the need of digital technology increases, the academic community in the University are required to improve the human resources especially lecturers as educators and students to play significant role in preparing the quality of Indonesian Human Resources by providing education and assistance to the community. This is intended to be able to compete in creative and economic independence by carrying out student activities that empower the middle to lower economic community.

Regarding to this condition, the lectures are encouraged to take part in various trainings to understand Generational Change, Community Change, Lifestyle Change, Industrial Process Change, and Cultural Change. All of this is needed to answer the challenges of changing the college system.

In education, lecturers must follow technological developments, so they are able to utilize the internet in the teaching-learning process, such as making e-books, assigning students through google classroom, updating and developing lecture material or discussing through social networking. Besides developing social networks, lecturers are required to carry out research activities and publish as well as present them in national seminars and international seminars or meetings, the lecturers must also carry out community service activities in implementing the results of their research.

## *3. Preparation for higher education in facing challenges of industrial revolution 4.0*

To meet the challenges and the needs of the required competency standards, the college must carry out the following steps;

The initial step can be preceded by accelerating the work of the industrial revolution 4.0 by synchronizing the work of higher education elements with patterns that are in accordance with the industrial era 4.0. To strengthen synergy with the current situation, the network and gather the power of digitalization are needed. The output results obtained are rapidly increasing quality. The workings of the industrial revolution 4.0 are truly oriented towards quality results. The strength of synergy for all elements of higher education is absolutely needed. The synergy of the power is demonstrated by collaboration as a component of the power of synergy.

The next step is stipulating to be recognized as World Class University (WCU). In this context, the excellence of higher education institutions must be achieved by taking part internationally. The global era cannot be repressed. Therefore, international competence must exist. International collaboration must be strengthened to form character, discipline, advanced mentality, the opening of an international network, as well as opportunities for discovering new creativity. The progress of science and technology as the key to the progress of Human Resources (HR) is easily achieved and will be open.

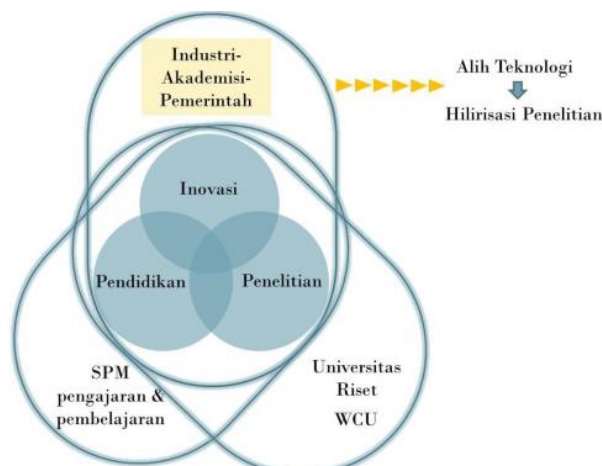
Next, universities are encouraged to contribute nationally. At this stage, the awareness that universities are the property of the nation will strengthen. The efforts that the children of the nation must be processed optimally in higher education will also be realized. Higher education must be able to read, see the nation's existing problems, and be able to provide solutions and contributions in overcoming them. The role of universities is not only to produce human resources, but also as an institution that participates in the progress of the nation, it must be clearly expressed.

The next step is to strengthen the network. The Industrial Revolution 4.0 is in need of a change in managing higher school institutions. Certainly, it really needs a network to be able to do national and international collaboration. Strengthening the network will also help in realizing the ideals of managing higher education in terms of Human Resources. Institutions, infrastructure, links and matches with industry, and so on. Finally, that the modernization process is accelerated. In this context, it is important to realize that higher school institutions carry out the process and face the digital generation of the 4.0 revolution era.

Therefore, modern performance and decision making must be quickly done. Modern, fast, and precise processes are needed. If not, the higher school institution will be left behind, even practically expired. This is a fact that must be met by universities, especially private universities.

To accelerate the improvement of tertiary quality, a model derived from Dikti, ITS: 2018 is needed next.

Development of Educational Model



## 5. CONCLUSION

Student behavior factors have experienced changes due to industrial revolution 4.0; namely the lifestyle in accessing the internet in its needs. The behavior of lecturers changes with the paradigm of

developing universities (Rogers 1985), so that lecturers always develop their course material and develop networks. The material happened to the majority of students and lecturers and academic support staff; rapid changes have occurred in all of the world's higher education including Indonesia. So that the community will consider the quality of graduation. The desire of students and lecturers is to get World Class University, while that causes of stability at a certain point in the change is an effort to maintain the values of local culture that is religious, intelligence, honesty togetherness, humans determine the direction of change

The results showed that social change in higher education is determined by various factors, including the development of the global environment and the demand to maintain the value of local wisdom, in improving human resources.

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## About Authors:

1. Prof. Dr. Ieke Sartika Iriany, MS is a lecturer at post graduate program, Garut University KOPERTIS region IV, West Java. Born in Bandung, 5 July 1958. She has an expertise as professor on social science field. Her scientific papers have been published on a several international journals and they have been presented on several international seminars, some of them are Presenters at Meijo University Japan (2015), Presenters at Wittenborg University, Germany (2016) and Presenters at University of Technology Malaysia (2017), Presenters at National Institute of Advanced Studies (NIAS) Bangalore India and Presenters at Jawaharlal Nehru University (JNU) Delhi India. At Jepang Presenters and Published at Copyright © 2019 GMP Press and Printing (<http://buscompress.com/journal-home.html>) ISSN: 2304-1013 (Online); 2304-1269 (CDROM); 2414-6722 (Print). At Hongkong presented and Published on Journal of Advanced Research in Social Sciences and Humanities, Volume 4, Issue 3 (129-135). DOI:<https://dx.doi.org/10.26500/JARSSH-04-2019-0306>
2. Rostiena Pasciana, SS.,MSi is a Lecturer at graduate program, Department of Public Administration, Garut University. Born in Bandung 26th February 1987. Her scientific papers have been published on national and international journals. Some of those were presented on international seminars, at Wittenborg University, Germany (2016), University of Technology Malaysia (2017), and Wahid Hasyim University, Indonesia (2017). At Jepang Presenters and Published at Copyright © 2019 GMP Press and Printing (<http://buscompress.com/journal-home.html>) ISSN: 2304-1013 (Online); 2304-1269 (CDROM); 2414-6722 (Print). At Hongkong presented and Published on Journal of Advanced Research in Social Sciences and Humanities Volume 4, Issue 3 (129-135) DOI:<https://dx.doi.org/10.26500/JARSSH-04-2019-0306>