Summary

[Title] Science and Technology Based Foresight Analysis for National Development Ⅸ- Comprehensive Report

· Project Leader: Byeongwon Park

· Participants: Jiyoung Suh · Sungju Hong · Seongwon Park · Junghyun Yoon · Sumin Choi · Sunji Kim · Sula Jin · Chang Ui Hong · Daye Jeong

Korean society faces serious challenges, such as sudden changes in domestic and international politics and uncertainty in the economic environment. Beyond material value meaning power and economic might, the time has come for us question what is important to human life, and change our standards. There is a strong basis now for starting a social debate in order to establish an alternative vision.

Innovation-based growth in the universal sense is the mission of our time and should be the biggest priority of the each government. There are two major reasons we found. First, Korea's growth potential has fallen to the mid-two percent level, which poses the biggest challenge to our economy. Without drastic enhancement of productivity through innovation, it will inevitably fall to the zero percent level. Second, we cannot fall behind in the global competition for innovation in the era of the fourth industrial revolution, where existing production systems, industrial and employment structures, living patterns and spending and competition paradigms are all changing.

2017 Future Studies focused on the practical use of the project and organic linkages between accomplishments. Focusing on future research for strategy formulation and policy proposals, the STEPI Center for Strategic Foresight has conducted detailed research activities, including constructing a knowledge base, intensifying networks and the expand of knowledge. Although such activities,

each with separate processes created customized research achievements for the government, expert groups and citizens, they have never been driven by an integrated process to address a particular future research topic.

This year, however, we tried to link the independent framework activities organically, in order to predict and analyze the impact of ‘Intelligent Information Technology’, which is the key driving force of the fourth industrial revolution. Most of all, we found key-words for the latest future study issues and research trends, and adapted the latest methodology to the research design using real-time future study system for constructing the knowledge base. Following this process, we conducted our first policy research ‘Global Trends and Korea : Science and Technological Levels of Preparation’, and as we recognized that it was necessary to examine ‘Intelligence Information Technology’, the driving force of the theme, a second policy research study was conducted on ‘The Influence of Intelligence Information Technology on Knowledge Production and the Expansion of Science Research.’ Additionally, the results of the study and the data arranged in the intermediate process were used for expand of knowledge, such as in the theme of a quarterly magazine which dealt with the challenges of the fourth industrial revolution and the contents of a future issue toolkit.

The core value of future foresight lies in its ‘applicability for better policy design.’ In order to actively apply the results of research and knowledge as a policy decision tool, there needs to be a practical discussion on the future vision and agenda for society as a whole. In the long run, we hope to make a future roadmap for social value realization which will accord with our environment. When this process is systemized, our society will be able to construct a community which can cope actively with innovation and change. We anticipate that these studies will contribute to the production of knowledge about the future and raise research capability. Furthermore, we hope this report will be helpful in improving ‘future literacy’ by widening awareness of what lies ahead.

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Summary

[Title] Global Trends and Korea : Assessment on Science and Technological Readiness

· Project Leader: Junghyun Yoon

· Participants: Byeongwon Park· Daye Jeong · Sumin Choi

Recently, Korean society faces serious challenges such as sudden changes in domestic and foreign politics and economic uncertainty. The threat of North Korea, US-China tensions, and instability in Northeast Asia make it hard to predict the fate of Korea. In addition, the recent wave of protectionism and anti-globalization sentiment, symbolized by Brexit in U.K. and, the election of President Trump in U.S., poses a threat to the highly dependent economy of Korea. The impact of such changes in global conditions no only impact this sector, but also the traditional industries that served as growth engines for the Korean economy, such as automobiles, shipbuilding, and steel are also in crisis. The problem does not stop there. Political polarization, the aging of the population and social conflicts make social integration for overcoming global challenges even more difficult.

The government is also faced with pressure to adopt more effective governance systems to meet the quickening pace of social change. As our social structure has become larger and more complicated, compared with the past, it is increasingly difficult to cope with problems right away. In particular, with the onset of the fourth industrial revolution, the advent of the hyper-connected society, strict structures make it harder to deal with the ever-changing challenges faced.

Society now stands at crucial crossroads, one where we must turn towards social integration and strengthening international competitiveness. To overcome the wave of uncertainty we face, we must consider various scenarios and make

new inquiries into the future. In this context it is vital, to reinforce system-wide capabilities, to find the challenge factors of global trends in the Korean context, and to prepare a practical agenda for dealing with those issues.

Therefore, the project for Future Studies in this year focused on examining how global trends impact our society. First of all, we tried to overcome the narrow discourse of past research and to undertake practical tasks in the Korean context, by examining overall discussions on the promotion of the fourth industrial revolution, using real-time future research navigation systems to build base of knowledge. In particular, we were able to overcome the limitations of existing studies which did not include a detailed diagnosis of the various drivers and potential impacts that make up trends. We did this by drawing implications based on the results of expert evaluations with relation to the overall process of R & D for each issue to simultaneously improve policy utilization. Through this careful reinterpretation process, we are able to diagnose our coordinates and understand their meanings more specifically.

We hope this study entitled ‘Global Trends and Korea : Science and Technological Readiness’ will contribute to future knowledge production and help improve domestic research capacity, while also functioning as a sketching tool for more innovative ‘policy-making system transportation.’ Furthermore, we hope that it will contribute to the improvement of the ‘future literacy’ of our society as a whole by enhancing awareness of the future.

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[Title] Research futures: exploring new ways of research work with intelligent technology

- **Project Leader : Jiyoung Suh**
- **Participants : Kibeom Park · Gicheol Jeong · Seongwon Park · Sung Joo Hong · Jinhee Park · Seonji Kim · Taekyung Kim · Suhong Um**

This study focuses on the 'scientific research' as one of the areas in which the Intelligent Information Technology is introduced rapidly. And this study will look at how the work related to production and diffusion of knowledge in scientific research is changing with the Intelligence Information Technology and how they will be changed in the future.

This study starts from the following awareness of the problem. First, the discourse of the artificial intelligence and substitution or extinction of job is prevalent as the Intelligence Information Technology advances, but the focus on the job persistence from the outcome point of view would bury the discussion on various changes such as 'changing working method', changing nature of work' or 'emergence of new work'. The current discourse is a phenomenon that occurs when technological innovation is just taking place and is stimulated excessively by the functional potential of the 'technological factor' itself. This study takes the stand point that Intelligence Information Technology needs more attention to how 'work' will change in interaction with various material and social factors related to 'work'. Therefore, this study focuses on Intelligence Information Technology and 'changing nature of work and organization method'.

Second, this study takes notice of the aspect that knowledge work consists of the holistic interaction of various material and non-material factors involved in the labor process. Knowledge work is often thought of as a work that consists only of human brain activities. However, in the course of knowledge work, humans use the body and various devices and technologies as well as their brains, and utilize their

experience and knowledge to do ‘work’ such as collecting and analyzing information and delivering the results. Something that constitutes the work may require a high level of knowledge, but so-called “odd jobs” also take up a large part.

Third, ‘scientific research’, as a form of knowledge work, is expected to have a great impact on the process and outcomes of scientific research if there is a major change in the elements that make up the ‘scientific work’. The changes in the method of conducting scientific research and the way of utilizing the results in the public domain have been raised from external factors, that is, from the aspect of economic, industrial and social demand; but the effect of the internal changes of scientific research has been paid less attention. (e.g. changes in nature of researcher , research organization, analytical and experimental equipment and devices, and research space, etc.). However, as we have seen in recent years, the proportion of science research equipment and analytical technology in the work methods of scientific research and diffusion of its result is becoming increasingly larger than in the past.

As a part of “research on the social effect of technology,” this study explores the current changes and future development direction related to Intelligent Information Technology, and then tries to find out the structural factors leading each direction. This study mainly focuses on the following two research questions. First, are there any emerging patterns which have not seen in existing scientific research work? Second, how can the Intelligent Information Technology be used to enhance positive effects and reduce negative effects? In order to find answers to the research questions, this study carries out literature review, surveys, FGI, and discussion of various stakeholder groups.

In order to investigate the impact of the Intelligent Information Technology on research work, this study first examines the changes in the research work which are presently suggested in the literature. It is also necessary to analyze the perceptions of stakeholders in forecasting future changes. What is important in ‘future foresight research’ is the analysis of how society anticipates the changes in the direction of the technology, and what changes the society members are worried about. Therefore, this study also conducts this analysis through surveys.

The next step is to explore the possibilities of changes of the meaning of existing work, the emergence of new value, and the change of work structure

through the use of technology through group interviews with researchers, students, and administrative and technical workers. Through these activities, it is possible to search ‘emerging needs’ or ‘opportunities’ and to explore ‘emerging conflicts’ or ‘risks’ which can appear through introduction of the Intelligent Information Technology, The final task is to explore the structural factors which are needed to realize ‘emerging needs’ and ‘emerging conflicts’. In the process of moving to the future, changes in the existing structure of practices and systems are essential. The search for structural factors is an exploration of what is needed to realize expectations for the future and what to improve to mitigate risk.

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