
Monthly Hallyu ReTport

Global Hallyu Trends

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Hallyu Issue Point

Monthly Hallyu Issues

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Global Hallyu Trends

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Hallyu Issue Point

Summary of Global Hallyu Issue, Edition # 132

Point 1

The future policies and strategies of cultural industries led by the 4th Industrial Revolution



Can the 4th Industrial Revolution jump start the future of cultural industries? This edition examines the understandings/misperceptions on the 4th Industrial Revolution and changes in contents consumption provided by technology-based environments. Experts emphasize the necessity of co-competition between various subjects and areas in the formulation of cultural policies as well as a focus on the user's needs and context as technology advances.

Point 2

Tourism/beauty/food industries and new technology



We looked at the 4th Industrial Revolution and its prospects in the field of tourism, particularly the core of Hallyu such as Korean food and beauty, which is the most favored Hallyu contents for overseas consumers. The platform economy, the IoT, and big data are presented as the key driving forces in the tourism industry. Virtual makeup and the omni-store strategy will drive beauty tech, and O2O service and artificial intelligence delivery will impact the food tech area. The 4th Industrial Revolution will change the way consumers find and enjoy products and services.

Point 3

Changes in buzz volume of the “4th Industrial Revolution” through data-analysis



When did the term “4th Industrial Revolution” began to be used popularly and get so much public attention? Through big data, we looked at the emergence of this term and the Boom Up aspect both globally and domestically. We analyzed the domestic discourses that followed the 4th Industrial Revolution through three-factor analysis.

Issue Focus

The 4th Industrial Revolution, cultural policies in the future and strategies of Hallyu industries

① **Knowledge information society and tasks for new cultural policies**

Hong Jae Lee

Dean of Graduate School of Culture and Arts Management, Chugye University

② **The future of cultural contents strategies, uniqueness rather than universality**

Kyu Tae Kwak

Professor, Department of Global Culture and Industry, Soonchunhyang University

③ **The future of tourism industry led by new technology**

Hyun Joo Kim, Researcher, Korea Culture & Tourism Institute

④ **The heyday of 'beauty tech' and 'food tech,' innovative cases and prospects**

Ah Young Kim, Researcher, KOFICE

① Knowledge information society and tasks for new cultural policies

Heung Jae Lee, Dean of Graduate School of Culture and Arts Management, Chugye University

Although there is much information about the fourth Industrial Revolution, there are also some misconceptions. Many people complain that they do not know what it means, and argue about whether it can even be considered a revolution. In fact, the term "4th Industrial Revolution" is a very implicit statement that binds various technological phenomena together. Nevertheless, it is undoubtedly a "revolution."

I recall the word 'smart power' that Obama used in his inaugural address. At that time, the U.S. showed great interest in how to continue its leadership in global competitiveness. The smart power and smart leadership he presented were suitable as a symbol of new leadership to lead the new era. In addition, it attracted much anticipation as an economic development solution.

The 4th Industrial Revolution can be seen from a similar point of view. The global socioeconomic environment is very unstable. The concept of the 4th Industrial Revolution that emerged in this process is still a bit hazy with "present progress into the unknown." In the consulting industry, consultants criticize the use of the term "4th Industrial Revolution" in various aspects of society, viewing it as a strategy to boast about the companies' own strengths.

The 4th Industrial Revolution in Korea was a popular keyword for politicians. Following the political panic in 2016, the reason for the 2017 presidential candidates making promises of the 4th Industrial Revolution was similar to those made by Obama. Some believe that they tried to instill hope, claiming that the 4th Industrial Revolution leadership could solve economic problems.

Now, it is imperative that we systematize the 4th Industrial Revolution in all fields and achieve results through an effective policy mix. Of course, there are people who doubt the political preoccupation with economic issues such as the 4th Industrial Revolution. But simply put, the 4th Industrial Revolution is not politically meaningless. In order for the 4th Industrial Revolution to be accepted in all spheres of society, a strategy followed by political leadership is very important.

It is important to receive strong political support for the 4th Industrial Revolution to become a valuable national competitiveness strategy for us. For example, after presenting the "2016

Reconstruction Strategy for Japan,” Abe abolished the existing “Industry Competitiveness Conference” and created a “Future Investment Conference” to take charge of new growth strategies. Abe will serve as chairman, while economic revitalization ministers and founders of IT companies will be made up of civilian members to carry out a daring public relations strategy. In addition, the "People's Dialogue," which was aimed at achieving 600 trillion yen in GDP, was abolished and was merged with Abe's own policies, displaying his leadership.

Can the 4th Industrial Revolution actually revolutionize national competitiveness, or will it end up just being used domestically as a symbol for political leadership? Some say we will end up at a disadvantage if we do not seize this opportunity from a practical perspective. On the other hand, if used effectively, it will help achieve global leadership and standards in the reorganization of the new economic order. It is not just the use of technology, but the need for strong participatory capital and investment, which can be a watershed for industrial competitiveness. It is a simple but very important issue, and political leaders must first grasp the significance and severity of this issue.

Could the 30 years of the history of cultural policies serve as “a new window that opens toward the future”?

The reality of the fourth Industrial Revolution appears to be more practical than initially expected. There is a fierce competition among countries to secure a global competitive advantage in the 4th Industrial Revolution. This revolution is a game that is very real. As you know, developed countries are making plans and gathering national policy power. The German government announced “Industry 4.0” in 2010 and has further developed it three times in the past three years. Their main plans are commercialization and a smart factory R&D roadmap. Japan also announced the "Japan Strategy for Leading the 4th Industrial Revolution" (2016) with the "Japan Reconstruction 2016" as the national grand project. Here, IoT, Big Data, AI, and Robotics are the main focus on reforming the country, establishing the government's intensive investment plan. The United States is promoting the establishment of a smart factory with its “Industry–Internet” plan. China is also trying to participate in the era of the 4th Industrial Revolution based on manufacturing through “China Manufacturing 2025.” But what about us? The administration has its own plans for the ministries concerned with the 4th Industrial Revolution. Private companies and organizations are also preparing to accept the trend with much interest.

The history of Korean cultural policies has been going on for over 30 years, only one generation

now. However, the cultural policies of the last generation were created as a reaction against the past. In other words, it established the identity of the cultural nation, sought competitiveness of the culture based on tradition, and appealed for the importance of culture and art to keep up with other policies. The policies were developed based on the idea that culture can lead regional competitiveness. Likewise, recent cultural policies have also gathered hope as the cultural industries are regarded as the new lighthouse to lead the national economy. Our nation's achievements so far have been quite significant.

A new generation is starting, and we are at the point when we have to implement cultural policies for future generations. The future of the cultural policies will be on "the optimism about the future." Culture and art will serve as a source of future national competitiveness and be used to solve longstanding social problems. Culture will also provide a source of global competitiveness. It is believed that the key to opening the era of the Gwanggaeto Kingdom of "Cultural Territory" should be cultural art. For us, culture and art is new windows that open up toward the future.

The 4th Industrial Revolution Society as an extension of the Knowledge and Information Society

The fourth Industrial Revolution has served as an important factor in the policy structure for the next 30 years. Culture and arts policies will be developed differently from the past in line with this turning point. In a society of infinite connection through intelligence convergence, the cultural arts and cultural industries will require a policy mix that realizes high added value. The biggest beneficiary of this process will be the cultural industries. From my point of view, the core of the 4th industry is "technology of expression and connection." This will enhance cultural content with fun entertainment. In addition, we will take the future of the Korean cultural industries to the world market with unceasing globalization without the "cultural discount."

There is no need to worry about "jobs," which are often a concern in the 4th industry, as they can be filled with the "work" of the cultural industries. Now, the human desire for infinite possession will turn into a desire for pleasure. At this point, infinite demand will be created, and the government must build an ecosystem to support it through policy consideration. The cultural industries ecosystem map is a policy priority, and it can be promoted as an ecosystem activator (Facilitator) that utilizes the private technology that has grown in the meantime.

We have been late in the 1st and 2nd industrial revolutions. We have reached a certain level in a

short period of time despite the words of our ancestors. This impetus led us to the 3rd Industrial Revolution, and now it will help a user in the 4th Industrial Revolution. Each element of innovation that is accelerated has been boldly developed. The knowledge and information society and the 4th Industrial Revolution society may be different from each other in essence, but they can show synergy by merging with many parts of the knowledge and information society. That is why policy continuity should be kept to a minimum. A bold cross-sectoral approach in policy is much more important.

According to the Swiss Bank research, Korea's 4th industrial competitiveness level is only 25th out of the 45 countries surveyed. In short, its competitiveness is very low. However, the items used in this survey are of course based on the advantages of European countries, and Switzerland is Number One. On the other hand, Korea has a high advantage in terms of education, informatization level, and curiosity. If we try to fill the gap, our country has a very good chance.

Emerging transformation of strategies of cultural industries

Now, how should the cultural industries policy be developed? All innovation starts with the agenda of the leader, and it is necessary to have a 'disclosure procedure' that promotes it with many people. The policies for the 4th Industrial Revolution and cultural industries will be influenced by establishing relations between different problems or factors. In this process, there is a high possibility of the so-called Diffused Coevolution that evolves together. This sustainable co-evolution grows together with the growth of the cultural industries ecosystem as the elements interact. As a result, we must strive to achieve co-competition and co-evolution in a virtuous cycle so that the entire ecosystem enjoys prosperity.

In the 4th Industrial Revolution, a grand project for rational policy development is urgently needed to implement cultural industries policies and boldly take a political and social initiative. The newly elected government should make policy reserves of future competitiveness with this as a priority. There is much controversy about whether the 4th industry should be led by the government or private sector. In the case of Germany, private companies and organizations are taking charge, while the United States takes a practical approach led by the private market, so it is not easy to follow a specific model. That is why traditional cultural industry history and administrative practices are important. In the case of Korea, the government should take the initiative and focus on improving the ecosystem to create conditions for the private sector to fully demonstrate their capabilities. It would be ideal for government policy to focus on distribution, finance, and governance. It is the government's financial

support and activity opportunities for the cultural industries workers that promote industrial and creative activities. In particular, it is a challenge for the public and private sectors to establish appropriate partnerships for financial matters. For small cultural groups and corporations, it is necessary to induce them to collect and manage related statistics for business development, and to help them find their interests through union activities.

Not only in Korea but also in France, the government presents the overall vision for the cultural industries and promotes it. We launched the joint management system of national and expert groups, and promoted the establishment of the Cultural Innovation Fund, the Ministerial Committee on Culture, and the Cultural Industries Task Force. In addition, there will be opportunities for consultation for cooperation between the central government and local governments. The national support model is also changing with the introduction of economic principles. Financial support organizations for the film and cultural industries, cultural content industry support fund, IT technology should be fostered. It should also balance public spending and find private capital to complement it. It should implement policies such as legal benefits or tax preferences for donations, and develop them into industries. In addition, private enterprise management methods should be applied to culture related organizations to achieve management rationalization.

We are in the midst of a new opportunity for our cultural industries to take a new leap forward. The opportunity for cooperation between the 4th Industrial Revolution and the cultural industries should not be missed if we are to realize a sustainable ecosystem. To do this, we must demonstrate political leadership, socio-cultural consensus, and the choice and concentration of private companies. We need to build network governance efficiently and invigorate the private sector that we have developed over the years. I hope that the new government will find the jobs that they have sought the most in the cultural industries.

② The future of cultural contents strategies, uniqueness rather than universality

Kyu Tae Kwak, Professor, Dept. of Global Culture and Industry, Soonchunhyang University

The 4th Industrial Revolution, where all content and devices go through a single path, has begun. If the past focused on intelligence and informatization of a single device including the smartphone (the 3rd Industrial Revolution), this is an era that considers the combination of various devices and services. Naturally, the ways in which operators are participating in the market have changed, and the consumer mindset is also evolving.

First, operators should develop cultural content to adapt to “super intelligence” and “super customization.” Netflix was a big data-driven cognitive system that developed a program that provides movies and dramas that consider the mood and emotional state of viewers. It is a preemptive service method that provides a “solution” before users themselves know what content they desire by capturing their instantaneous interests. The power of the system to grasp the context of the customers deeply changes the way of supplying the content. Especially, the characteristic of the “context grasp era” is specificity rather than generality. Amazon's artificial intelligence speaker “Echo” gives the best answer to the user's voice by guessing the purpose of the utterance or the desired result.

Indoor GPS technology is also worth watching. The space that emerges as the core field of future content consumption is the home. According to the big data collected by DaumSoft, a research institute that specializes in Big Data, the “home” is tied to various content such as movies, dramas, and news. Watching YouTube videos or watching dramas before bedtime has become a part of home life. In the past, it would have been important to have a facilitator to make content available anytime and anywhere via mobile devices, but now it has become necessary to identify specific environments, such as when the user is in the house or in a car. In a smart house, location information and data collection are essential for content consumption according to the mood and environment of each place such as a table, sofa, bed, and so on. It is expected that data network configurations based on Beacon, an indoor positioning technology, will be an important means of achieving this.

“New Experience” created through fusion

The business model in this rapidly changing technology base is the creation of a “new experience”

through innovation fusion. In the era of the 4th Industrial Revolution, the boundary between technology and markets is disappearing. In the past, the results of convergence based on ICT were ambiguous. There were various types of convergence services such as SmartFactory and SmartPharm, but it was unclear whether the strategy would cross the boundary between industries. Experts interpret these services as simple informatization and automation than fusion.

In the 4th Industrial Revolution era, technologies and industries will meet to form a new type of user experience and market. Content can be experienced anywhere, anytime, and it can be transformed into a mediator role that can be experienced in a specific spatial and temporal context. For example, let's look at the experience-oriented Smart Farm, which has recently become a hot topic in agriculture. Originally, it started by only providing visits to rural farms, but it is now possible to go on a "Culinary Tour" which is a multidimensional experience through touching the plants grown in nature and tasting food in nearby restaurants. The farms visited by users are "plant farms" controlled by an agricultural management system or artificial intelligence. Services that take into account the interests of the visitors, as well as the mood of the farmer, are possible. When augmented reality (AR) and virtual reality (VR) are combined, farms can act as "naturalistic exhibits." Agriculture, ICT industry, and cultural industries are combined and fused to create a "New Experience."

Connecting on an emotional level with machines and content is now possible. "Jeebo," a robot that MIT has been developing for years, not only serves as an agent that can cover various household chores, but it can also accurately anticipate users' needs, serving as an "alter ego." It seems to be a product that will appeal to the elderly who crave intergenerational communication and consideration from their neighbors. For those who desire more human interaction, a small word from a machine can be a great comfort and even a source of vitality of life. To this end, not only the convenience of technology but also connectivity to daily life must be considered.

Winner-takes-it-all society

One of the core business models in the era of the 4th Industrial Revolution is the "winner-only society." The reason for this is that the companies that have grown through the platform service in the past have entered new markets that seem totally unrelated. Google is the culmination of non-related diversification such as search portals, electric cars, agriculture, and so on. Google understands that these services do not have much synergy right now. In the long run, however, it is viewed as a means of building an empire that can attract consumers to their brands under the guise of a consumer experience. Google, which has been building up its reserves in a boom period, is working hard on

corporate empires with bold mergers and acquisitions and greenfield investments in times of crisis. A similar example is Kakao, which recently decided to open “Kakao Taxi” to the financial market. From a consumer perspective, a taxi service that does not require cash payment has replaced traditional call taxi services. Confident of its service competitiveness, Kakao is looking into the possibility of monopolizing ICT and taxi hailing markets through bold spin-offs and IPOs. This strategy was possible because of purchasing a taxi app called “Kim Gisa.” This approach cannot be easily copied by other competitors.

In addition to mergers and acquisitions, some companies are seeking to win through new business investments. From the end of May 2017, Facebook began offering its own content through news feeds. YouTube, Amazon, Netflix, etc. However, there are reasons why Facebook is more threatening than other platform services. It is the fact that many media consumers approach content through Facebook. Around 2 billion people around the world are participating in media use such as news consumption, watching videos, and accessing advertising sites, while making friends through Facebook. The change is so scary that it can be said that “All roads do not lead to Rome,” but “All roads are on Facebook.” Facebook's production and distribution of drama and show content actually resemble the case of Snapchat with its content distribution. Analysts say that Facebook wants to recapture the throne of Snapchat, which is becoming popular with its 10-minute or shorter entertainment videos and web dramas for people in their 20s and 30s. Some say Facebook also has the lurking intention of “building an empire,” which seeks to capture various advertising and PPL revenues accompanying the video. In Korea, a lot of major broadcasting content is spreading via Facebook. With solid manufacturing capability and technical distribution capability, Facebook may soon be readying to take over broadcasting companies.

Service experience of users: “subscriptions” or “watching in bits?”

Consumers' choices in the era of the 4th Industrial Revolution, where everything is freely connected, can be divided into two extremes. It would be possible for a scenario in which a bundle of service products of a particular brand family is purchased and subscribed, just as the operators want. The Netflix model is representative of this. The key is to make consumers join with monthly subscriptions, allowing them to watch dramas and movies every season. Netflix has a model that allows customers to come up with what they want to buy and even recommend what they like. On the other hand, it is necessary to consider the way in which intelligent users easily depart from the service and purchase new content. The offline store market is already in a “split purchase” position due to the supply of

coupons and services of various social shopping sites. Consumers are not buying the whole service category, but buying it according to taste and situation.

Just seeing the leap in the web drama market, the possibility of “hacking” is already being realized. Media users are already bored with purchasing 45 - 60 minutes of content, most of which they do not care about. They are more interested in smaller doses of storytelling-based content that can be enjoyed in 10 minutes. It is similar to the phenomenon of dramas being segmented by episodes and movies being viewed in clips. Screen captures featuring only specific lines are attracting the attention of netizens. In the era of the 4th Industrial Revolution, consumers are in a "hypernetworking" society, and their reputations based on their taste in content will become more important. There are cases in which “net sages,” who are power netizens overflowing on Facebook and Twitter, systematically analyze the pros and cons of content and act as critics. Once a user's loyalty to a media franchise is lost, trust for a whole certain media category may also be lost.

Stimulate well the liking or disliking points without reason

Robert Merton, a sociologist who sharply analyzed the super-capitalism of American society in the early 20th century, talked about the concept of "unintended consequence." Some act of an entity may cause people to react completely differently than intended, and there are plenty of chances for acts of good faith to be accepted as evil. Thus, when interpreting certain social phenomena, it is the sociologists' consensus that the researcher should not only see the intended result, but the bandwagon effect, which is formed by the action. As information becomes more and more prevalent, a situation in which operators are overwhelmed with unpredictable acclaim or hatred will come. It is important to not only be able to understand the situation of consumers who want and reject certain situations but also to accept their behavior as a natural social dynamic and be able to respond to issues using new content. This will not be an era in which the minds of consumers change according to the provider's service. We also need the wisdom to accept the problems that customers raise as a form of “content” and respond to them with our own content.

③ The future of tourism industry led by New Technology

Hyun Joo Kim, Researcher, Korea Culture & Tourism Institute

Major factors of the 4th Industrial Revolution

The concept of the 4th Industrial Revolution was first proposed by Klaus Schwab at the World Economic Forum in January 2016. This topic, which predicted a stage of the industrial revolution that humanity will experience in the future, has rapidly become a central topic in international society and spread in the industrial and economic sectors. The 4th Industrial Revolution claims that social media and the Internet will monitor the daily lives of mankind in the future, and a new era of big data and AI (Artificial Intelligence) at its center will rise.¹

It is expected that revolutionary changes will be made in terms of speed, range, and impact. There are as much skepticism and criticism as a keen interest in the 4th Industrial Revolution. What is clear, however, is that the technological change anticipated for future societies will revolutionize not only our daily lives, but also society and economy as a whole. This article focuses on the impact of the 4th Industrial Revolution on the tourism market and looks forward to the expected changes in the future.

What are the key technical elements of the 4th Industrial Revolution? If the core of the 3rd Industrial Revolution is the "digital revolution" based on computers and the Internet, the core technology elements of the 4th Industrial Revolution could be summarized as IoT (Internet of Things), AI, and big data. First, IoT (Internet of Things) refers to the technology or environment in which sensors are attached to objects to exchange data using the Internet. Being scalable, IoT enables real-time communication and discovery of various service models. Secondly, AI is a technology that realizes human learning ability, reasoning ability, perception ability, and understanding of natural language through computer programs.² Third, big data means regular and unstructured data, which is difficult to collect and analyze using existing methods and tools because of its huge amount.

The technology elements leading the 4th Industrial Revolution are reflected in the data processing process. First, the sensor converts consumer demand information into digital information. Second, IoT

¹ The 4th Industrial Revolution (2016). Klaus Schwab and 26 others. Quoted from Next Wave Publishing

² Referenced from Doosan Encyclopedia

converts the captured digital information via wireless communication. Third, AI extracts consumer patterns by analyzing aggregated mass information in real time. This process overcomes the existing limitations in information processing processes and dramatically expands the areas of utilization. The recently introduced O2O (Online to Offline: a phenomenon in which the online world and the offline world coincide) is a concept that refers to this process. In other words, the 4th Industrial Revolution creates a variety of business models through the combination of unit technologies or technology elements.

The 4th Industrial Revolution and the changes in tourism consumption structure

Technological changes based on sensors, the Internet and AI, which are key elements of the 4th Industrial Revolution, are causing various changes in tourism consumption patterns. Major changes in the tourism market will be driven by the platform economy, Internet of things, and big data. The first thing to note is the change in the travel product distribution structure based on the platform economy³. As the proportion of individual tourist increases, a platform-based sharing economy model is rapidly growing. Typical examples include Airbnb, the world's largest accommodation sharing service launched in August 2008, transportation service Uber, and global travel site TripAdvisor⁴. As of 2016, Airbnb was evaluated to be worth \$30 billion, and the company value of Uber, a peer to peer ride sharing service that serves more than 400 cities in 68 countries around the world, is worth \$ 62.5 billion (as of March 2016).

The global travel review site TripAdvisor has about 340 million visitors a month, listing about 350 million reviews and ratings on 6.5 million accommodations, restaurants, and tourist attractions. These enterprises, all representative platform companies, are expanding their business model based on automation and connectivity.

The growth of the global online travel agency (OTA) is also experiencing noteworthy change. The online travel market based on online platforms has been rapidly increasing, affecting the structure of the tourism industry. According to Euromonitor, the online travel market grew 19% year-on-year to mark \$ 246 billion in 2015, including the Asian market, which grew 43% to a total sum of \$79 billion. Global OTAs such as Expedia, Agoda, Ctrip, and Rakuten entered the Korean market, transforming the domestic tourism consumption structure. As a result of expanding collaboration between

³ Platform economy refers to the diverse production and consumption activities among economic entities based on digital technology and network (KT Economic Research Institute, 2017)

enterprises based on platform economy, the distribution structure of tourism products and services is changing innovatively.

Overseas, Google launched the Google Trips app in September 2016. It is a personalized tour guide service with information on over 200 cities around the world. Almost all its features work offline, as if aiming for the recently emerging O2O service. At its core lies the day plan service, which recommends travel itineraries according to various themes based on Google’s accumulated information about its users. Google Trips offers not only guides to more than 200 tourist attractions but also customized recommendations for restaurants and destinations based on each user’s personal Google history. It also collects information on flight tickets, hotel reservations, vehicle rent information, etc. automatically from the user’s e-mail and uses this data for providing customized information. Leverage its power over information, Google made its advance into the online travel market official, and competition between existing travel apps in the market such as TripAdvisor and Yelp is expected to intensify. At the same time, consumer convenience is likely to be improved due to these advances in mobile-based tour information service.



* Source: Reorganized based on Google data

Sensor-based IoT is expected to grow in connection with smart signage and curation functions, etc. In regard to this aspect, various experiments are being implemented in the area of tourism. For example, Seoul city announced plans to create IoT zones in tourist-centered areas such as Hongdae, Sinchon, areas around Ewha Woman’s University, and Gangnam station. In those areas, various services for travelers will be implemented: smart tourism information, experiential (mission-based) tourism, smart shop and facility guides, mobile order & payment, O2O fintech, travel safety & loss prevention service, parking space sharing service, IoT storage and delivery service, and real-time guide poles for local information. In the field of tourism, technology utilizing IoT will contribute not only to tourist convenience but also to safe travelling.

The analysis of tourism patterns based on big data will also play a big role. In the tourism sector, the foundation for establishing policies based on big data is being created. Changes in tourism trends are examined through cloud analysis of mass media reports, and social media trends are investigated to comprehend tourist preferences and identify their inconveniences and grievances.

More efforts are being made to identify consumption patterns such as industry, region, and items preferred by tourists in collaboration with credit card companies. Private sectors such as duty-free shops analyze tourist traffic using location-based services and big data, and strengthened customized shopping information service is provided according to a travel site and time.

Since 2015, the Japanese government has launched a foreign tourist trend analysis system using big data. Information related to foreign consumption trends surveyed by the Japan Tourism Agency, as well as information about the mobile phone locations of foreign tourists provided by private companies, are used for the analysis of big data collected by the government. Through this process, information about the nationality, travelling routes, and journeys of tourists visiting sites in various regions can be collected and analyzed.

The 2017 budget on tourism sector announced by the Japan Tourism Agency was ¥ 25.6 billion, which has increased 4% compared to the previous year. One of the Japan Tourism Agency's 3 core businesses for 2017 included an analysis of complaints and improvement of infrastructure for foreign tourists using big data.

Recently, BAT (Baidu, Alibaba, Tencent)⁵, the 3 major Chinese ICT enterprises, are driving aggressive M&As against OTA travel companies in the travel industry. Furthermore, these companies are improving the quality of travel marketing by linking with big data-based ICT technology. They are also using Korea—their domestic market of outbound travel—as a testing market, which is one of the largest outbound markets to a neighboring country.

Korea ranked 25th in “Capability to Deal with the 4th Industrial Revolution” ... more openness to global enterprises is needed

Korea ranked 25th out of the 139 countries on the “Capability to Deal with the 4th Industrial Revolution Ranking” by the Union Bank of Switzerland (UBS). Switzerland led the rank, followed by Singapore (2nd) and the Netherlands (3rd). Among surveyed Asian countries, Korea ranked lower than

⁵ Abbreviation for the 3 major ICT Internet enterprises in China, which include Baidu (core business: search engine), Alibaba (e-commerce), and Tencent (SNS). The sum of the market capitalization of these 3 companies add up to \$ 54.2 billion

Singapore (2nd), Japan (12th), Taiwan (16th), and Malaysia (22nd). In detail, Korea ranked 23rd in technology level and 19th in the education system, whereas it ranked 83rd in labor flexibility, indicating that it lacks the flexibility needed for the upcoming transition in its economic system.

<Table 1> Grade of impact of the 4th Industrial Revolution by country

Category		Labor flexibility	Technology level	Education system	SOC	Legal protection	Impact degree
Use index	Rank	Labor market efficiency	Advanced education training	Innovation	Technology acceptance of national infrastructure	Property rights, Copyright, Judicial independence	Weighted average of ranking
Switzerland	1	1	4	1	4.0	6.75	3.4
Singapore	2	2	1	9	3.5	9.00	4.9
Netherlands	3	17	3	8	6.5	12.50	9.4
Finland	4	26	2	2	19.0	1.25	10.1
U.S.	5	4	6	4	14.0	23.00	10.2
UK	6	5	18	12	6.0	10.00	10.2
Hong Kong	7	3	13	27	4.5	10.0	11.5
Japan	12	21	21	5	12.0	18.00	15.4
Germany	13	28	17	6	9.5	18.75	15.9
Taiwan	16	22	14	11	20.0	31.25	19.7
France	20	51	25	18	12.0	31.00	27.4
Israel	21	45	28	3	26.0	38.50	28.1
Malaysia	22	19	36	20	35.5	34.50	29.0
Korea	25	83	23	19	20.0	62.25	41.5
China	28	37	68	31	56.5	64.25	51.4

* Source: UBS (2016). Extreme automation and connectivity: The global, regional, and investment implications of the 4th Industrial Revolution.

Openness to global enterprises will be an important issue in the future era of the 4th Industrial Revolution according to the Korea Economic Research Institute, in contrast to the global trend towards reorganizing regulations and institutions for the legitimization of the Uber service. In Korea, Uber services have been partially discontinued due to the ongoing controversy about its illegality.⁶ San Francisco, Washington DC (U.S.), and London (England) already legitimized Uber, defining it as a

⁶ Uber Korea stopped offering UberX—a vehicle-based service by individuals—in March 2015, just about two years after entering the Korean market. Currently, Uber Taxi and Uber Black using existing taxis are the only services available

new type of service. Amsterdam (Netherlands) and Australia are considering the legitimization of Uber service⁷.

<Table 2> Introduction of Uber and corresponding government actions in major cities

Country	City	Status	Government action
US	San Francisco	<input type="checkbox"/> Individuals may provide Uber service after obtaining a driver license, completing a criminal history inquiry, completing training programs, and enrolling in insurance policies	Legitimized
	Washington DC	<input type="checkbox"/> Individuals are permitted to provide Uber service on the condition that they complete a driver identity check, enroll in insurance policies, and undergo vehicle checkups	Legitimized
	New York City	<input type="checkbox"/> Accepts Uber services, mitigating regulations and registration standard of yellow cab at the same time	Considering legitimization
Singapore	-	<input type="checkbox"/> Permitted within the regulatory framework by the government	Conditional permission
Japan	Tokyo	<input type="checkbox"/> Local Uber service providers register as travel service providers and use an exclusive rent vehicle for their services, thereby causing no controversy yet	No controversy about illegality
Hong Kong	-	<input type="checkbox"/> Call taxi app service market is very popular & active <input type="checkbox"/> Hires drivers with taxi driving licenses which minimizes the resistance of the existing taxi market	No controversy about illegality

* Source: Quoted from Korea Economic Research Center's press release

In the era of the 4th Industrial Revolution, it is forecasted that the competitiveness of national tourism will be largely affected by the flexibility and openness of the tourism market. In particular, it is imperative to improve the system for the transition to a consumer-based on-demand economic system. An on-demand economy is a way to provide various services desired by consumers based on mobile networks, rather than the existing mass production and mass supply system. First and foremost, systematic support policy for strengthening the technical capacity of private enterprises should be provided based on the government's mid and long-term planning. What we need is an environment that provides the foundation for an evolving business model, linking the online and offline tourism consumption structure in a mobile platform. This is also the reason why the importance of supporting and creating startup companies is emphasized. Among these rapid changes in the structure of tourism consumption and the prosperity of neighboring countries, it is time to concentrate all our capabilities for the future, which will be led by new technologies.

⁷ Quoted from Korea Economic Research Center's press release

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④ The heyday of ‘beauty tech’ and ‘food tech’:

innovative cases and prospects

Ah Young Kim, Researcher, KOFICE

#1. *In the old days, the ‘cosmetics lady’ used to go door-to-door with a credit book in one hand and her big bag full of merchandise and in the other. Mommy used to test the products on her skin using samples—but this imagery is outdated. Today, everyone can simulate make-up on a 3D make-up app, and an AI (Artificial Intelligence) chef can provide customized recipes for diabetics using big data analysis.*

#2. *“At this point when the whole industry structure is changing, we cannot reach the future without changing our way of thinking.”⁸ Retailers of the food & beverage, fashion, and beauty industry were in a crisis due to the long-term recession, impeachment and presidential election, the launch of the Trump Administration in the U.S., and diplomatic conflicts between Korea, China, and Japan. These retailers have gathered together to form a crisis breakthrough solution based on change. Technology innovation was what helped drive their decision to survive through change.*

#3. *Although the dream of “cultural prosperity” fell to pieces, the Korean government is busy preparing for a new growth engine. Following the establishment of the “2016 mid and long-term comprehensive measures for the intelligent information society,” the “Intelligence and Social Strategy Committee,” a public & private sector joint consultation body—which is an expanded and reformed version of the Information and Communication Strategy Committee—was also formed. In 2017, a budget of \ 12.6 billion was set for the development of VR (Virtual Reality) content, and another \ 13.9 billion for the development of core hypernetwork technology. This implies that the intelligence information society including AI and ICBM (Internet of Things, Cloud, big data, and mobile), will have a powerful influence on all industries.*

These are some aspects of the 4th Industrial Revolution faced by the beauty and food industries, presented by the rising new generation of Hallyu content following drama and K-pop.⁹ Changes in the

⁸ “New Year’s Message at the meeting of Food-Beauty-Fashion industry CEO” (Hankyung, January 3, 2017.)

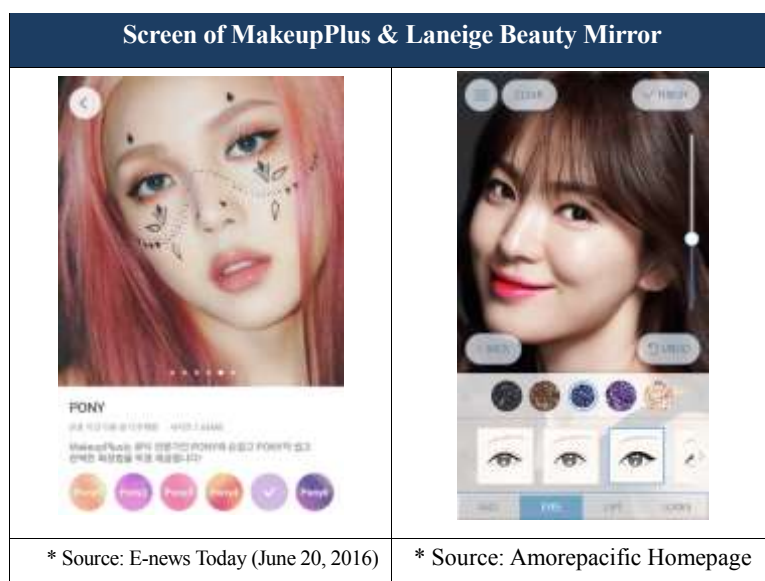
⁹ According to the “2016-2017 Global Hallyu Survey,” Korean food (47.1%) and fashion & beauty (41.0%) were the most preferred Hallyu content in Korea. The area predicted by most respondents to show the same level or an increased level of usage after 1 year was fashion/beauty (3.8%). This article focuses on the beauty industry since business profitability in the fashion industry deteriorated when Korean textile apparel exports decreased by 4.8% (\$ 12,426,000,000) compared to last year (Ministry of Commerce, Industry and Energy, May 1, 2017), and fashion businesses are seeking to make a breakthrough with cosmetics instead of apparel.

beauty and food industry led by cutting-edge technology are rapidly spreading in the name of “Beauty tech (Beauty + Technology)” and “Food tech (Food + Technology).” These are new concept words that demonstrate that the 4th Industrial Revolution will have a greater impact on representative Korean consumer goods than ever before.

The modernization of experiential service and distribution strategies

① Beauty tech – virtual makeup and omni-store strategy

The global food & fashion industry is centering itself around technology. Apps simulating celebrity makeup in real-time as well as AI delivery service apps are emerging on a global scale. One notable example of this phenomenon is makeup artist Pony’s (Park, Hye-min, known for being the makeup artist for the idol singer CL) collaboration with the Chinese virtual makeup app “MakeupPlus”—their app ranked No. 1 in the Apple App Store just 4 days after release. On this app, users can apply the “Pony effect,” including 6 virtual makeup styles by Pony, to simulate perfect eye makeup techniques such as diamond-shaped tattoo, eye shadow, and extended eye-lines. A search for the hashtags (#) “Youcammakeup” and “Makeupplus” on Instagram—the barometer for measuring the scale of fandom for certain content—shows 96,506 posts and 84,905 posts with those tags, respectively (May 2, 2017). This proves the immense popularity of this beauty app¹⁰. Even celebrities and beauty influencers also posted their selfies wearing Pony makeup on social media, making the app go viral. MakeupPlus with Pony successfully realized the evolution of beauty content through collaboration with technology.



Amorepacific, which is the first Korean company to rank among top 10 among the world's top 100 beauty companies selected by the beauty/fashion media WWD, launched the company-wide “Digital Transformation Project.” This project applies “digital DNA” to various business areas such as marketing, sales, and brand storytelling. This movement

¹⁰ According to the 2016 joint survey on the use of social network service (SNS) by KT Economic Research Institute and Nasmedia, Instagram showed the highest increase rate (16.7% → 28.1%) compared to the previous year.

has been maximized in the “omni-store” strategy with its strengthened O2O services. Launched in August 2016, the “Laneige Beauty Mirror” app is available for users to experience on mobile as well as in some brick and mortar stores. Beauty Mirror is able to recognize changes in angle and light in real time & virtually simulate makeup without actually applying makeup products on users’ skin, and it works both online and offline. “LOOKS” by Naver subsidiary Line Plus has also gained a reputation as the selfie app with the best shots. Through its special features, users can experience new products of major Korean cosmetic brands such as Hera, Etude, Ohui, and VDL, as well as favorite brands of women in their 20s and 30s such as Shu Uemura and Bobby Brown. It is quite sophisticated compared to past makeup apps that could not even match the user’s eye lines and lip lines.

② Food tech – O2O service & AI delivery service

Also in the restaurant industry, the creation of a new industry combining ICT (Advanced information and Communication Technology) and AI (Artificial Intelligence) is in full swing. Currently, domestic and foreign food tech services can be classified into 3 categories: Delivery, information providing, and order & reservation. Especially in Korea, services have rapidly developed, focusing on food delivery services that deliver food through mobile payment, and O2O services where consumers order their meals via a mobile device and pick them up at stores. Woowa Brothers Corp. (operating the ‘People of Delivery’ app) which attracted investments worth 40 billion won & \$ 50 million respectively from Goldman Sachs (2014) and Hill House Capital Group Consortium China (2016), launched an artificial intelligence (AI) project called 'Baemin David' for the first time in the industry. This project launches a technology where a chatbot¹¹ specialized in delivery apps learns Korean expressions related to different kinds of food, taste, portion, and preferences. This enables the app to help users easily order food through its voice recognition capabilities. For example, if a user says, “I have a bad hangover. Anything that’ll help?” Baemin David will recommend food that will help relieve the user and assist in ordering as well. An initial budget of 10 billion won was invested in this project. Siksik, a food-tech platform company with 3 million users, has also recently introduced a chatbot service that recommends restaurants based on the customer’s personal taste. Drivers of these new technologies are focused on implementing an easy, comfortable, and fun user interface.

¹¹ A chatbot is a robot implemented to answer the user’s questions following pre-set response rules on an interactive interface. An example is the Starbucks Chatbot, which helps customers to order quick and personalized coffee through their order history and conversation. It has the advantage of driving consumer interest and enabling interactive communication.

Benchmarking “hyper-connected, hyper-intelligent’ global models

The emergence and development of Korea's beauty tech and food tech resemble hyper-connected and hyper-intelligent advanced services. L'Oréal, the No. 1 beauty company among world's top 100 beauty companies¹², appointed Lubomira Rochet (ex-Microsoft employee) as the CDO (Chief Digital Officer)—and not CEO—3 years ago. The company succeeded in providing customized service reflecting individual consumer’s characteristics by inventing the “Makeup Genius” app that provides virtual makeup for the user’s face.¹³ In recent years, L'Oréal not only developed its own app but also started to act as an accelerator for beauty tech startups. In Korea, Amorepacific is following this trend and decided to provide mentoring and funding for domestic beauty tech startups. In addition to launching apps that incorporate new technologies, the intention to utilize innovative startups is part of an active response to changes through hyper-connectivity where objects and people, as well as people to other people, are connected by networks.



The domestic food tech market is almost similar to the mobile-and-AI-centered global companies. JustEat of Denmark, which started its online food delivery service in 2001 and Grub Hub of US that

¹² In 2016, L'Oréal ranked No. 1 in the world's top 100 beauty brands selected by the WWD (Women's Wear Daily). Among domestic companies, Amorepacific is the only company ranking within the top 10. WWD's annual list of the world's top 100 beauty companies is based on published performance data from global beauty companies. According to Yonhap News (Apr. 17, 2017), the rankings announced on April 14 (US time) were based on each company's 2016 beauty sales. During this period, Amorepacific Group achieved a sales amount of KRW 6.6676 trillion, which is about 4 times more than compared to KRW 1.5565 trillion of previous year, as well as a profit of KRW 1,828 billion, which is a five-fold increase from KRW 237.5 billion of previous year.

¹³ According to actual beauty startup status report (2016), 31% of the world's beauty tech patents are related to image processing, followed by data mining (13%) for personalized service and product recommendation, and sensing devices (12%) for skin information recognition. Technology on kiosk and 3D printing are also receiving much attention in the field of beauty tech. Based on these trends, beauty tech is expected to exert its influence through the “omni-channel” strategy that includes all points of contact such as mobile app, brick and mortar stores, and web sites.

followed with the same service in 2004 are 1st generation food tech enterprises. Domestically, Baedaltong, People of Delivery, and Yogiyo (in that order) opened the era of 2nd generation delivery apps starting in 2010.¹⁴ In 2014, People of delivery, which is the No. 1 delivery app in Korea, has established the joint venture company Line Bros with Line Japan, an affiliate of Naver, launching the premium lunch delivery app “Line Wow.” As the possibilities of the delivery app market are revealed, the internet enterprise Kaka also entered this representative sector of the O2O service. An unprecedented cognitive computing cooking app, “Chef Watson” has been in service since 2015. This app made by the cooking magazine Bon Appétit in collaboration with IBM develops and proposes completely new recipes. Even the world's largest car share company Uber, is preparing the domestic launch of a service called “UberEATS.” The global competition has already begun while domestic disputes are still ongoing about whether the 4th Industrial Revolution can become a new growth engine for the beauty and food industries. The U.S. is making bold investments, even in the absence of a clear business model, while China is chasing up with its large capital, and Japan is focusing on nurturing the robotics industry at the national level. In particular, the fact that these countries have grown in the process of converging manufacture and IT suggests that Korea also needs the “time to build up experiences.”



Prospects and suggestions for the beauty tech & food tech industries

Innovative advances in technology, as well as new environments provided by digital devices, are restructuring the existing industrial structure. The O2O strategy and interaction with artificial intelligence are emerging as new variables in the beauty and food tech market, and the increase of single-person households, emergence of YOLO (You Only Live Once) lifestyle, and prolonged recess

¹⁴ Unlike 1st generation food-tech companies, which merely provided web or mobile based order services, the 2nd generation food delivery service is differentiated in that it even made it possible to deliver gourmet-class restaurants' signature dishes to users' homes.

in consumption are all acting as social factors that lead to changes in the market. Above all, the Millennial generation (now in their 20s and 30s) who spent their childhood years in the 1990s when the technological revolution took place, is expected to lead consumption for the next 20 years, creating a new market centered on consumer experience and data. At this point, there seems to be no doubt that technological advancement of intelligent content, changes in consumer lifestyle, and the growth of beauty and food tech will be inevitable.

On the positive side, the digital consumption trend in the beauty and food sectors promote cultural transitions like in the past Renaissance era. The patterns of change are also diverse. Experts mention the introduction of natural and organic cosmetics certification, expansion of the scope of functional cosmetics, and investment in R&D for the development of new materials as key tasks in the beauty tech field. In the food tech field, smart farming, robotic kitchens, and even molecular gastronomy¹⁵ are being discussed. In particular, the opinion that the lengthy value chain of the beauty and food industry allows easy linking of keywords such as culture, tourism, and history is being taken more and more seriously, resulting in various related projects such as the establishment of a food tech cluster in Jeju as well as the combination of food technology and tourism carried out by the government at the local and central level. These actions can be regarded as the first evidence of such changes in perspective.¹⁶

If so, is the state-of-the-art technology promised by the 4th Industrial Revolution the answer for everything? According to Professor Elizabeth Garbee of Arizona State University, the 4th Industrial Revolution was first discussed 75 years ago. The term “4th Industrial Revolution” was also used when nuclear energy emerged in 1948, electronic engineering grew more widespread in 1955, computers were popularized in the 1970s, and the era of information industrialization started in 1984. In addition, the vision of the 4th Industrial Revolution suggested by Klaus Schwab is based on “changes in life” beyond the reorganization of the industrial structure by technological innovation. This is because changes in the industrial structure are not a result of mere technology development, but the co-evolution of various factors and entities such as technologies and institutions, culture and governance, and producers and consumers interacting with and influencing each other. Furthermore, the conditions under which time and space constraints disappear and global exchanges are activated result in the

¹⁵ A cooking technique that introduces various physical and chemical methods in ingredient selection and cooking process to maximize the original taste of the ingredients—a karmic intersection of science and cooking.

¹⁶ On July 22, 2016, it was suggested on the <Forum on the economy and tourism of Jeju> that the construction of the world's largest food tech cluster based on O2O (Online To Offline) service, combining Jeju's clean food with cutting-edge ICT technology, will revitalize to the Jeju economy. The Ministry of Culture, Sports, and Tourism, the Ministry of Agriculture, Forestry, and Livestock, the Ministry of Maritime Affairs and Fisheries, the Ministry of Future Creation Sciences, and the Small and Medium Business Administration held the <2017 Tourism Venture and Food Technology Competition> to foster enterprises that create future food items, which is also a signal for predicting the growth and expansion of food tech.

intensification of quality competition between content. Ultimately, the differentiated qualitative competitiveness of content acts as the core, while technology should be regarded as a tool for the utilization and distribution of such content - a reason why it is important to note that the term “tech” attached to “beauty” and “food” could be either adopted or rejected by consumers, depending on whether it reflects the user's lifestyle appropriately.