제주해녀 인류무형문화유산 유지 방안 연구

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A Study on the sustainability of Jeju Haenyeo, an UNESCO Intangible Cultural Heritage

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The development of ICT brings the change in daily life and the digitized data are increasing in usage. The combination between GPS and internet results in extensive diffusion of space related information by way of smartphone, sensor and SNS.

Jeju Island is only one special self-governing province in Republic of Korea and deserves to be proud of the unique culture, having those designated Intangible Cultural Heritage from UNESCO such as Culture of Jeju Haenyeo or Women Divers and Jeju Chilmeoridang Yeongdeunggut or Exorcism of Praying big Catch.

In this paper, I suggest how to preserve fadable tradition economically and technically and expect to develop Haenyeo fitted portable sensors and IoT platform.

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1. Introduction

Mobile-phone subscriptions worldwide are 4.6 billion and Internet access people are about 2 billion in the world[1]. Facebook has over 1.06 billion monthly active users with 30 billion pieces of content shared on Facebook every month. And roughly 175 million tweets happens every day among about 465 million accounts.

Though the data usage increases 30% from year to year, the unequal distribution of data usage pattern would worsen throughout the nations, ages, regions and industries[2].

And according to Garner, even for the project to use big data, the success rate in business is only 40% for 2017 year[3]. This infers how we have to elaborate when we make a plan to develop data based services.

The uneven data application in every field of industry affects the biased development and investment. Also, we might lose any valuable heritage without notice. So, it seems that we try to make consciously greater efforts on the investment for the disappearing valuables, which are not received attention but keep the meanings through human history and life.

2. Customer Centric

A. Supply-Driven vs Demand-Driven

Over the past ten years, Walmart has become the world's largest and arguably most powerful retailer with the highest sales per square foot, inventory turnover, and operating profit of any discount retailer. In its transition from regional retailer to global powerhouse, the organisation has become synonymous with the concept of successful supply chain management[3]..

Walmart's supply chain innovation began with the company removing a few of the chain's links. In the 1980s, Walmart began working directly with manufacturers to cut costs and more efficiently manage the supply chain. Technology plays a key role in Walmart's supply chain, serving as the foundation of their supply chain. Walmart has the largest information technology infrastructure of any private company in the world. Its state-of-the-art technology and network design allow Walmart to accurately forecast demand, track and predict inventory levels, create highly efficient transportation routes, and manage customer relationships and service response logistics.

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There has been much more demand-driven than supply-driven marketing and policy as the prevailing ICT and IoT, even though I could not find out any finite statistics between those concepts from the perspective of the penetration of ICT. But it seems to me that the ICT/IoT advanced country like

Korea, to take demand-driven strategy is easier than supply-driven, comparing with less ICT/IoT developing countries.

There are many success story to transform from supply to demand basis. Orbital ATK is a global leader in aerospace and defense technologies. The company designs, builds and delivers space, defense and aviation systems for customers around the world, both as a prime contractor and merchant supplier. Its main products include launch vehicles and related propulsion systems; missile products, subsystems and defense electronics; precision weapons, armament systems and ammunition; satellites and associated space components and services; and advanced aerospace structures. Headquartered in Dulles, Virginia, Orbital ATK employs more than 12,000 people in 20 states across the U.S. and in several international locations.

B. Choice from Two Ways

The supply-driven way is good for the dominant market leaders, because they could manipulate marketing, price and eventually supplyment. It is easy for multi-national company to support customer, keeping price and time-to-supply as long as customer's needs stay in the controllable range.

But, in case that customer tries to get any irregular product or services, supply-driven way could not make any satisfaction with easy. The category of irregular things is wide and could not simplify to a certain industrial field.

In 2016, Klaus Schwab, World Economic Forum's Founder and Executive Chairman, pointed out the Fourth Industrial Revolution[4]. Schwab estimated the mega changes in our life to come widely and deeply in every field of ours, either daily doings or industries and polities.

We are entering the 4th IR which is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres. The 4th IR is distinguishable to the points of its velocity, scope, and systems impact. Because of the penetrated information and the connected telecommunications, the speed and depth to influence and change will be fast, accurate and predictable. This will also alter the method of production, management and control.

C. Sustainability combined with ICT/IoT

It is not to escape from network society which is connected by ICT. And for every reasons, the human beings and things are being monitored and within communication distance under the social agreement or on their own purpose.

The high value of human beings is in their character and creativeness, such as uniqueness which is different from others, but they should be invaluable when they connect to others without gaps. This becomes the very single point to maintaining human beings in the community and globe. The things also are a part of environment of human beings, which get independent, if the owner, human beings, allows them to do what is in their controllable range. It looks like that the higher level of self-controlling and self-decision of the things will be regulated under the laws, whatever the capability of things prove themselves and convince human beings.

3. Jeju Island

A. Specific ICT/IoT for Jeju Island

Jeju is a volcanic island, 73 ㎞ long across from east to west, 31 ㎞ wide from north to south and 1,848 ㎢ surface area. The dominating mountain, Hallasan, 1,950 metres high is located at the center of the Jeju Island and the highest mountain in Republic of Korea.

For telecommunication operators, Jeju Island is very attractive area to implement island wide coverage with economical investment. This comes from the shape of Jeju Island, a reversed funnel, which create easy and arithmetic estimated plan for deployment. When wireless goes in Jeju Island, the effectiveness and economics are much higher than wireline similar to the popularity of wireless communication system and its service in underdeveloped or developing countries. This does not mean that Jeju Island is in the primitive wireline communications service. Either wireless or wireline services are in the same level that of main land, Korea peninsular.

B. Customer Centric Jeju Culture

Jeju Island serves well to visitors and foreigners, which might be formed for ages. If we see recent statistics, the visitors are outnumbered by the resident population in Jeju Island. Jeju International Airport deserves a compliment to make those movement possible and is the busiest airport in domestic airline route.

We learn from Jeju Island about how we could keep tradition under such an open community environment. The more Jeju Island got visitors, the higher Jeju Culture needs to keep tradition and its unique heritage.

Jeju Culture will be meaningful until Jeju Island shows their tradition. It is not necessary to the visitors, through on-line or off-line, to develop new or modern events regarding Jeju Culture. As a living culture, Jeju Culture stays there without changes, as Rome does for many centuries.

C. Sustainable Jeju Culture

According to the statistics, any visitor to Jeju Island comes over and over again. We believe this trend has continued for a long time, because of Jeju Culture in which this is backed by exotic scenery, distinct dishes, imaginary myths and truthful kindness. Because it is internet or on-line era, I expect to see the reality to be said by statistics how often on-line visitors click and surf the internet to show the attractive Jeju Island and its Culture.

Many visitors simulate and rehearse their travel in cyber space before they start. It could be good for Jeju Province Government to show what would be the multiple visitors either off-line or on-line. If it is possible, which visitor feel satisfaction to Jeju Culture.

Though we have seen, visitors without coming Jeju Island could not feel the Jeju Culture. Recently, visitors look every

corner before they come to Jeju Island. So, the living Jeju Culture is crucial in its reality and in cyber space.

4. Story Board

A. Haenyeo Culture as UNESCO Intangible Culture Heritage

It is said that 4 thousand Haenyeo is registered, but half of Haenyeo are active. There had been a few facilitating policy for Haenyeo. It seemed that there was not any ICT or IoT technology involved yet. I remember Jeju Special Province Government would like to subsidy Haenyeo taking account of the frequency of working in the sea.

I devide the active area into two. The one is a working field, that is diving to catch the seafood. The other is living area, such as home and social activity area. Also, I consider coverage as large as possible, because Haenyeo should be secured her movement not only in workplace but about daily activity area, which I assumed that these two area covers more than 90% of Haenyeo activity.

B. Singularity of Haenyeo Culture

Haenyeo is meaningful when she is in working at sea. But to do active diving undersea, she should be healthy and ready to work anytime. I assume that Haenyeo Culture is unique as intangible culture heritage for proving her value in the sea, which should be backed up by her health and sustainability.

To my research, there is not any specific analysis on following cases, which will be useful to solve the issues on Haenyeo and to improve the Haenyeo Culture,
- the ratio between working time and ordinary life time
- the medical data at work and at home for each person
- the counted number to work
- more personalized record to demonstrate the reality of them
- any guideline how to keep the Heritage
- etc.

C. Service Scenario for Haenyeo Culture

It is assumed in this paper that the service scenarios are developed under the consideration of ICT and its accretional IoT components. Devices to be worn by and attached to Haenyeo are different to the activity of them.

(1) ICT/IoT Service at Work

It is chosen by me that the items to check the number of access to workplace, the sea, and personalized physical record are to monitor the respiration, cardiac impulse and ambient sensing with the head mount and swimming suit.

Breath and heart beat are counted by the embedded biological sensor device on head mount and swimming suit. These are driven by the rechargeable or changeable battery and the sensors are selected through the experimental ways, sometimes these are customized and customer oriented.

Because those data do not exist, we could take many circumstances into consideration such as the capability of aqua-measurement and the performance at underwater operation.

The sensored data are used two ways. One is an immediate response to Haenyeo at the underwater to move away from the workplace or to notice abnormal physical status quo. The abnormal and quick movement notice could be felt with vibration.

At MWC2017 in Barcelona, Spain, KT and Kolon, two Korean companies, demonstrates 'Life Tech Jacket' which automatically delivers sensored data from disaster at mountainous and marine activities by way of IoT technology. This means that IoT equipped jacket will be generalized to the public and could be customized earlier than our expectation. The problem to use in general is high price such as half million Won for sale. It is composed of jacket and life kit in which goggle, rechargeable heating panel, wind generator, camera, GPS and Morse signal generator.

We can see from this example that life guard suit came to us already.

(2) ICT/IoT Service at home

It is sorry that we do not have any information on the ratio between to stay at work and to live at home for Haenyeo. But it is also natural to assume that most of time goes for Haenyeo in land rather than at sea. Though I insist that the real Haenyeo Culture is at sea, which is their workplace, but Haenyeo Culture can be accessed in land or at home.

In this paper, I study how to care and support Haenyeo to their health and safety. I assumed the more basic items to check-up Haenyeo to hold her daily life healthy and safe as well as those could be chosen would be acute and chronic disease which are related with mortality. And I considered the much elderly community of Hanyeo where high level of care and safety are required.

The basic operation of ICT/IoT at home or day activity area is similar to that of at work except the coverage and service to support are diverse. Once the abnormal status is monitored, then it is spoken out loudly to the surroundings for help and delivered to any designated or pre-assigned third party such as guardian and service provider by the audio and quick message.

If the urgent message will be detected to the third party, it might be double checked before any rescue method starts. In case that Haenyeo stays around at home, the camera of smart phone or fixed CCTV can support to the spot of incident. When the accident happens outdoor, the public or previously set CCTV would be applied to catch the site status. As the more big data backed up by GPS, the moving route of

Haenyeo will be used effectively to trace and be rescued.

The forced report from the order of the third party shall arrive and manual or automatic delivery to ask support will follow.

5. Service Implementation and Maintenance

After the internet got into our life from about 20 years ago, smartphone covers in a lot of ground in ordinary person's daily life. And innumerable applications has been rising and falling.

The unchanged and dominant apps, as a result becoming embedded application into any newly hands on smartphone, are about health or diet related ones. One of the next big service after smartphone would be any wearable or physical related device based practical one. The typical features of fitbit keeps any holder or wearer in connection to personal boundary or medical category to collect the information about real-time heart beat, the amount of physical exercise whether it comes from volunterily or mandatorily, sleeping state monitoring for balanced healthy daily life.

A commercial fitbit to count steps, distance, heart beat, outdoor activity hour, recommending physical movement, sleeping information, GPS, smartphone linked call, SNS receptance, vibration, loss protection, five days battery life, etc.
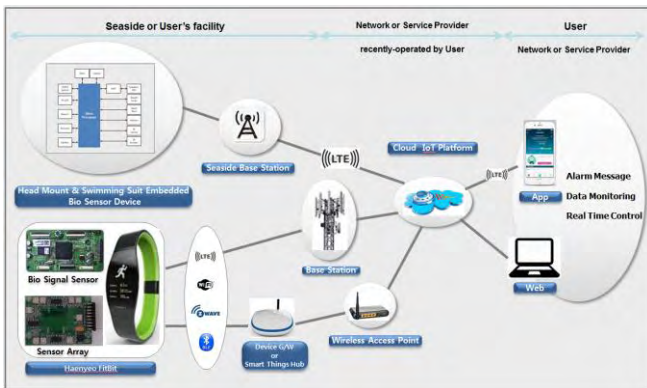
(Fig. 1)

Service System for Maintaining Haenyeo Culture

I thought the Haenyeo Culture can be sustainable with the triple interesting groups, such as Haenyeo themselves to work, public organization to support and customers or global civilians to concern.

I count that the importance of Haenyeo is almost the same as that of customers, who are ready to understand Haenyeo Culture. Public sector like Jeju Provice Office, Seoguipo and Mosulpo County, and Haenyeo Culture Community have significant role to publicize, subsidy and advertise.

6. Conclusion

When I learnt that Jeju Haenyeo Culture was selected as UNESCO World Culture Heritage, I started to worry about how to keep the Haenyeo Culture[5]. Without Haenyo's activity at sea, how we can believe Haenyeo Culture will exist and continue in the future.

I deliberated to apply the very advanced Korea ICT and IoT to Haenyeo, in which biological, ambient, disaster sensors are used to Haenyeo closely.

With my idea, the number of work at sea and the active Haenyeo can be counted and Haenyeo will be subsidized and confident to her activity. They can produce her autobiography by the action of daily and normal movement.

I hope we can start see the Haenyeo Culture from Haenyeo's and Customer's view. Who are the customers to Haenyeo here? I have to say all the global citizen and organization who care Haenyeo and try to understand that long and unendurable Haenyeo Culture, which I definitely say, those are produced from one of the most dangerous and disappearing work place.

Reference

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