

Identifying Citizen's Needs in Smart City Services through User Participation Research

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Abstract: This study has operated the open type living lab participated by citizen as a plan for the systematic understanding and the rapid feedback of citizen needs on smart service. The result of this study can be utilized as a basic data in which enterprises and public organizations can reflect the needs of citizens for new smart service planning for the future.

Keywords: Smart services, Citizen's needs, Feedback, Living lab

1. Introduction

This study aims to derive the needs of citizens in service area to promote the advancement and utilization of geographic information-based Smart City services. Recently, with activation of the introduction of Smart City around the world, the network between urban infrastructure has been strengthened through IoT devices, key components of Smart City. This enables various information based on geographic information to be collected and processed into more sensible information, and provided in the form of Smart Services. however, it has usually been provided by convenience of suppliers like companies or public institutions that provide smart services, so there are limitations that it has not fully reflected the Needs of citizens, core beneficiaries of smart services. Lately, as a way to improve these problems, the Living Labs reflecting the Needs of citizens, who are actual beneficiaries of the services, has emerged by directly participating in planning - designing - development phase of services. In this study, we ran open Living Labs which citizens participate as a way for

systematical understanding and quick feedback of the Needs of citizens as subject of the Smart Services of Smart City Empirical Complex Assistance Project that Ministry of Science, ICT and Future Planning and Busan Metropolitan City are building in Haeundae area. Through this, we could find common requirements by each smart services from the individual opinions of citizens on the smart services. In addition, by applying standard such as feasibility and preferences, the materialized citizens' opinions for sub-functions that make up each Smart Services were derived. The results of this study will be used as basic data to reflect the demands of citizens by companies and public institutions when planning the next new smart services.

2. Space information service and Living lab

2.1. The paradigm change of space information service

Even if its type and the production, utilization method have been changed in accordance with the flow of times, the space information has been recognized the important information all the time. It has digitalized various information generated in space by the development of digital technology from the paper map typed data, established into DB and promoted the paradigm of digital space information. Today, it has been

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developed to Geo-IoT concept paradigm supplied in real-time by collecting and processing various and precise information of city through the emergence of smartphone and ICT technology. Through this, the areas of service utilizing the space information have been diversified, it has been utilized in communication, industry and public sectors very actively. It has expanded the market of space information by classifying, producing and distributing the required information through the participation and communication of demanders in the area of communication. It has contributed to the creation of new market through convergence in the area of industry. It has been utilized as a public customized public service strategy in order to solve social problems, to support the decision making of policy in the area of public. The global trend of space information is to increase the value of space information by satisfying the user's need through the convergence of inter-service and inter-industry, by creating the additional value through user's participation.

2.2. Living Lab

A living lab, one of the open type innovation, contributes to the local and social problem solving by various stakeholders from various areas such as citizens, public sectors and companies. The development of various science technology such as ICT and IoT has led the offering of real-time information based convergence type space information service. But some cases were found they didn't fully perform the role of service as they couldn't reflect the user's need fully for the development of service.

In order to improve this, the Living Lab has been emerged as a methodology, which enabled the offering of advanced user centered high quality service through the participation of user. The essence of Living Lab is to solve the local problem while v

arious stakeholders such as citizens, public sectors and companies gathered to enhance the value of service. We can say that it is very important the process of feedback which delivers and collects the opinions of stakeholders among this complex interest.

The application area of living lab has been continuously increased, this study conducted the living lab targeting Geo-IoT based service of open type smart city experimental complex project executed by Haewondae-gu, Busan.

3. User Research

The purpose of open type smart experimental executed by Haewondae-gu, Busan is to illustrate the Geo-IoT based service based on open-type smart platform. It is composed of "the livelihoods of the public" for the sector of citizen safety, "the life environment type" service for the local environmental improvement and "the traffic improvement type" service for public transport which is local current issue. One of the core performance goal is to discover and illustrate experience type IoT based urban promising service and citizen participation, which is the most urgent for the urban problem solving of experimental complex by inducing the participation and interest of citizens. Accordingly our research personnel conducted the citizen satisfaction evaluation for 6 services of 3 sectors performed in the year. UI/UX method was conducted to draw and evaluate users of service. We collected user to form the citizen community through persona on the relevant service. The citizen community collected the satisfaction on the service specific function, the priority and the opinions related to service function improvement at the stage before service establishment. The service satisfaction and citizen opinions related to function improvement will be collected through service specific actual site experience at the completion stage of

Table 1. The citizen's requirements on Geo-IoT service

Division	Needs
Information collecting	-Sensor malfunction caused from worsening weather -Real-time information analysis and update -Various typed information delivery
Smartphone	-Convenient use for the elderly -Securing the convenience of the disable -The development of Substitute device is required.
Location determination	-Privacy protection from private location identification -Establishment of additional equipments to secure the precision of location identification
Road	-Figure out the pattern of road transport -Re-establishment of road system -Business cost saving plan for the service expansion -Consider the public transport support service from owner driving car centered service -Multiple support for the driving minority -Various information delivery system of transport information
Other details	-Enhancement of information delivery system for unmanned car -Power saving of social infrastructure by using renewable energy

4. Conclusion

Our research personnel conducted the citizen evaluation on each service of smart city service establishment project executed in Busan. The evaluation result on each service was analyzed by word meaning connection network, we found that some opinions were shared with other services among analyzed result. Accordingly when we collectively analyzed the opinions on 6 services through word meaning connection network, we could draw the contents which should be universalized to the smart city service. These outcome can be utilized when the service planners must consider prior to the smart service planning for the future.

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