Understanding the Daily Activities of Korean Senior Citizens Interacting with Embedded Computing

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Abstract: Aging populations are a phenomenon that industrialized nations have had to start addressing in recent decades. To understand the needs of an aging population, designers, architects and city planners must work together to accommodate and integrate a rapidly growing senior population.

Rather than creating additional special infrastructure like nursing homes or geriatric centers, the focus of the poster will be on how to extend the independence and quality of life of senior citizens through the application of mobile and embedded computing.

This poster presents the application of design scenarios by a group of industrial design students to explore and understand the daily activities of Korean senior citizens and how the application of mobile and embedded computing can significantly improve their self-reliance.

The poster will present student examples that explore the different situations that Korean senior citizens face in their daily lives. The poster will address the issues of independent living, health, and interaction with the local community.

Key words: Senior Citizens, Mobile Computing, Embedded Computing, Design Scenarios.

1. The Student Project

1.1 The Sponsor

A construction company was looking for an industrial design school to sponsor a student project. The company is the owner of a master plan to develop a hi-tech city in Korea. This advanced city will eventually have 500,000 residents; the official language will be English and all city public services will be world-class.

The company has already had architects, engineers and urban planners working on the master city plan. But, due to the magnitude of the project, some areas like telecommunication and mobile computing had to be worked separately thus creating the need for a dedicated group for this purpose.

The group focused on specific areas like homes, offices, schools, retail facilities, and public transportation in the new city. They concentrated on research and concept development in these areas working within specific parameters. The group designed concepts (services, product experiences, and systems) for specific users at home, at the office, in stores, and other environments such as public transportation. One of the target user groups was senior citizens.

Industrial design students focused their work on improving the experience of Korean senior citizens in this new city through the use of mobile and embedded computing.

2. Mobile Computing and Embedded Computing

Currently, we are living in a mobile computing society. The market penetration of mobile phones is a sign of the times. Virtually every person in developed countries owns a mobile phone at this point. In developing economies, the market penetration is still growing at a high rate.

Most people only use the voice feature of their mobile phones, but there is a growing market penetration of mobile phones with features like internet/e-mail access, real-time navigation using a global positioning system (GPS) and even features to make electronic payments wirelessly.

The ever expanding capabilities of mobile phones make them the ideal tool to replace or complement multiple devices like home/office computers, phones, TV's or even credit cards, wallets and organizers. Carrying one of these "smart" phones can help us manage our daily activities in a more organized manner.

Smart phones represent the epitome of the current state of mobile computing but, in the near future, there is a new kind of computing on the horizon called embedded computing.

In the world of embedded computing, a person does not need to carry a smart phone all the time. This does not mean that the user has to discard his smart phone. It only means that computing power is everywhere; even if the user does not use a smart phone.

The computer power could be embedded in a wall, a door or a window. It is invisible to the eye but it is everywhere. In other words, you can interact with these objects the same way you interact with your smart mobile phone or other computing devices. For example, the walls and windows in a house could double as gigantic video monitors or the door itself could double as a digital scanner. The applications of embedded computing are endless (see Figure 1.)

In the case of senior citizens, the use of mobile and embedded computing in their daily activities could help them to keep their independence and extend their self-sufficiency significantly. This technology could be incorporated in their homes and also in public places. Embedded computing should be considered when designing hi-tech cities like the one being constructed in Korea.

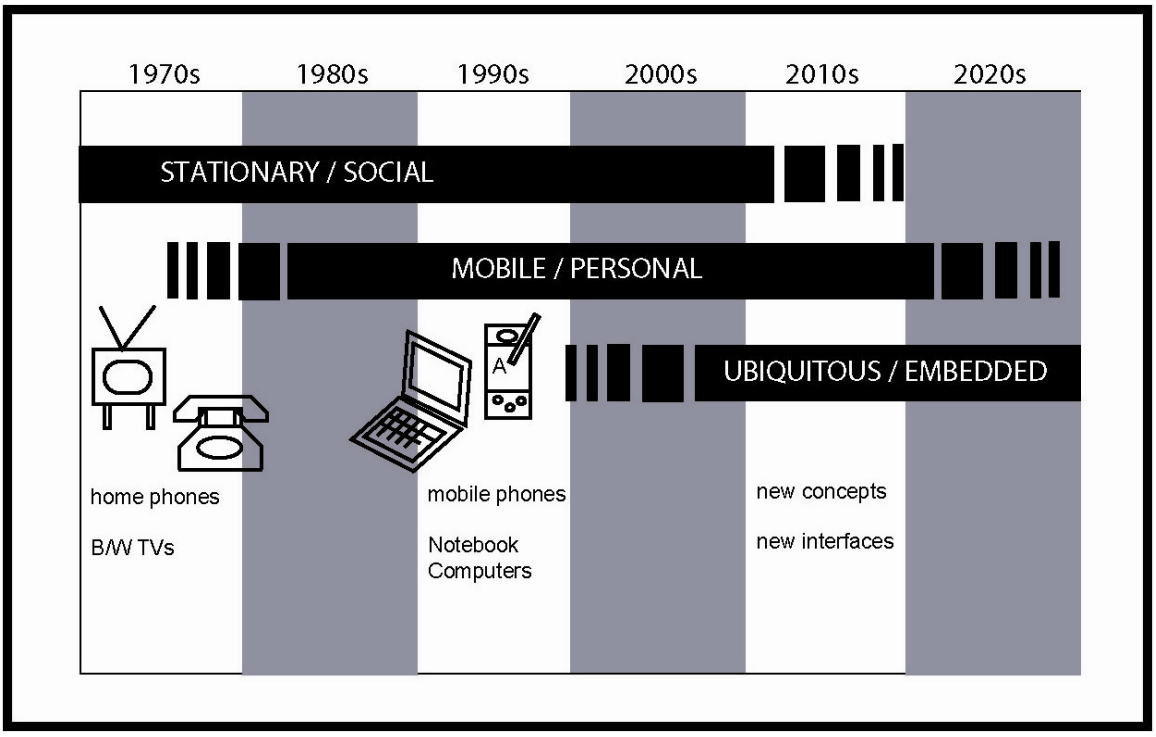

Figure.1 Changes in telecommunications technology affect the interaction between products and users over time. This relationship is increasingly more interdependent.

3. Design Scenarios

In order to present their ideas to the company sponsoring the project, students were encouraged to use design scenarios. Design scenarios are a graphical form of storytelling. Welker and Sanders utilized design scenarios extensively as part of their research work conducted at Fitch Inc. [1] Joi used design scenarios as storyboard frames to describe user interactions. [2] Kunkel described how Sony Corp. used an advanced form of scenarios to present concepts of future mobile computing devices. [3]

Industrial design students focused on the application of mobile and embedded computing in the daily activities of Korean senior citizens.

They showed their scenarios as part of an individual poster presentation. The goal was to present ideas to the company's top management whose background is not necessarily design. The scenarios should be self-explanatory and present one or several daily activities in which senior citizens use mobile or embedded computing to keep their independence and extend their self-reliance in this new hi-tech city in Korea.

Design scenarios are not a prediction of the future but rather an exploration of alternative situations. They can present products or services but the focus is instead on the user's activities.

This type of scenario presentation in poster format enabled a discussion between industrial design students and the company's managers. It helped keep the focus on the big picture (which is the life of senior citizens in the new Korean hi-tech city) instead of discussing about products and services which is secondary.

4. Student Example: "Live Assist"

One example of student poster was the presentation of "Live Assist". A system designed to assist senior citizens in the new city with the help of mobile computing.

Mobile computing is represented in this case by a smart phone that the senior citizen uses to get a combined assistance from a computer server and a "live" advisor (see Figure 2.)

This same combined system could serve as a "lifeline" in case of emergencies until an ambulance or other rescue team arrives.

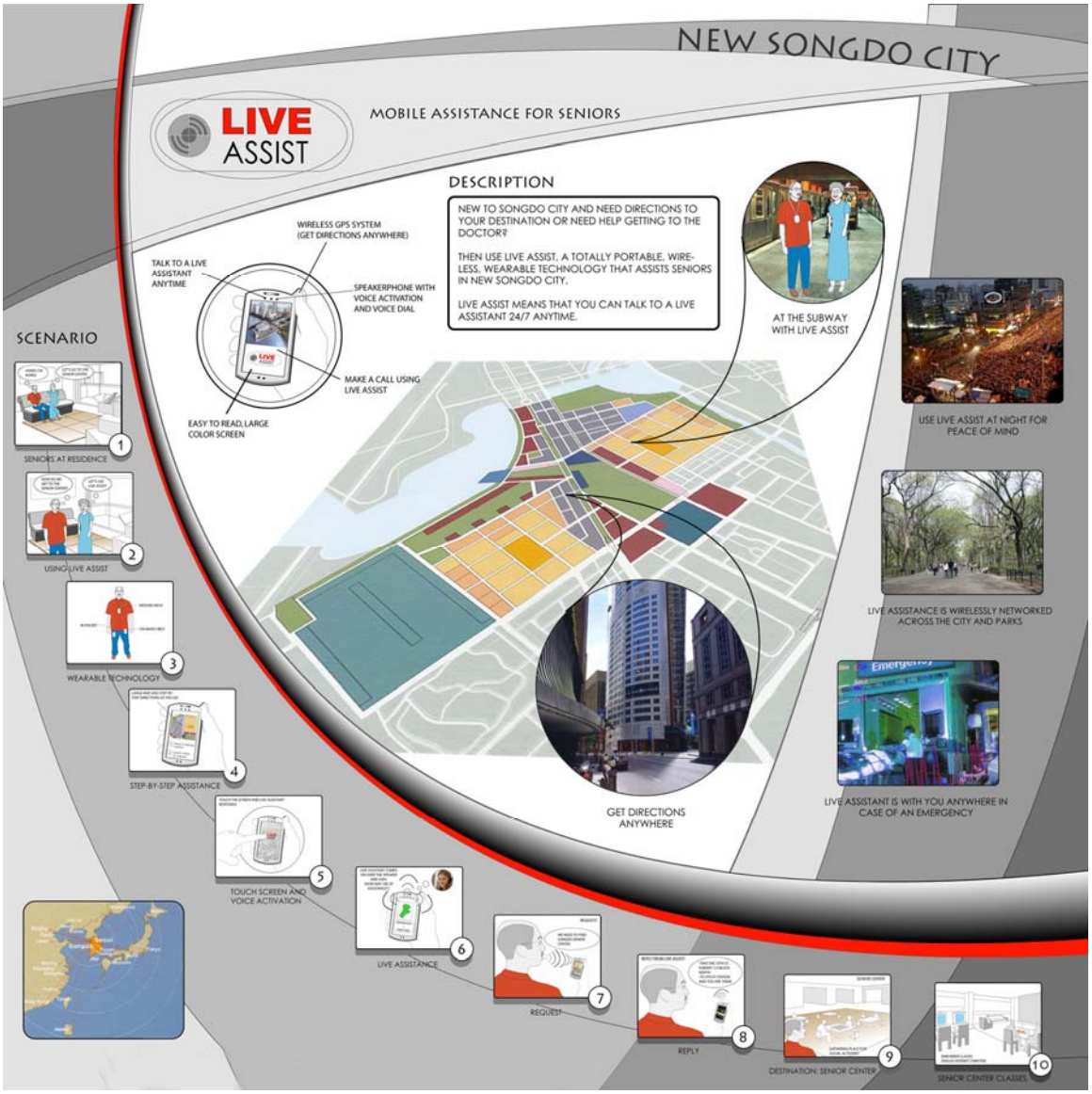

Figure.2 Student example in poster format: Senior Citizens and Mobile Computing.

5. Student Example: "Sensitive Nursing Home"

Another example of student poster was the presentation of "Sensitive Nursing Home". A living environment designed to assist senior citizens in the new city with the help of embedded computing.

Embedded computing is represented in this case by a "smart home" where the Korean senior citizen lives and spends a significant amount of time.

The smart home is full of smart devices embedded in the walls, windows, furniture, basically everywhere. The combined functionality of all of these devices helps to maintain the self-reliance of the senior citizen during his daily activities (see Figure 3.)

Figure.2 Student example in poster format: Senior Citizens and Ubiquitous Computing.

5. Conclusion

This student project was an exploration of possible applications of mobile and embedded computing for senior citizens in this new hi-tech city in Korea. The purpose of using design scenarios in poster format was to enable a discussion between industrial design students and the company's top managers. It also helped keep the discussion focused on the user's daily activities instead of specific products or services.

Due to the managers' non-design background, the professor instructed the students to communicate their ideas utilizing design scenarios. This tool appeared to be more appropriate because of its simplicity. Design scenario frames are usually simple and easy to read. Traditional design student presentations consisting of full-size drawings of products would probably have been insufficient.

The application of design scenarios in poster format also helped to communicate the different situations that senior citizens would experience in this new hi-tech city in Korea. The use of mobile and embedded computing in their daily life could help them keep their independence and extend their self-sufficiency significantly.

Design scenarios also serve as a collaboration tool with other professionals involved in the same project like architects, city planners and engineers. The design scenario format is usually self-explanatory and easy to read regardless of the training or educational background of the audience.

6. References

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