

## Critical Success Factors in Ubiquitous City Implementation:

### A Capability Perspective of IT Service Company

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#### ABSTRACT

In recent years, a city becomes urbanization, and several urban problems are being occurred. The demand of efficiency for the urban function is increasing, and the ubiquitous IT receives attention for the solution of that. IT companies are leading this change. Thus, IT companies needs several capabilities to solve these challenges. This paper aims to identify Critical Success Factors (CSFs) of u-City implementation based on expert interview research. In addition, the expert survey research is conducted about drawing capabilities to achieve each of the CSFs. This study will provide the guidance to draw the capabilities of IT company in u-City industry.

**Key words:** Critical Success Factors, u-City implementation, IT Service Company, Capability

#### Chapter 1. Introduction

##### 1.1 Background

Ubiquitous City (u-City), considered a promising solution for various urban problems using Information and Communication Technologies (ICT), is expected not only to realize efficient urban functions but also to be more economical and to improve convenience and smart living quality of the residents.

On the government level, related laws and regulations are established and revised, new technology and human resource development and support will help fast-growing IT services based urbanization, and u-City industry is being developed to enhance nation's competitive force. In Aug. in 2009, 52 areas in 36 local governments were under development or planning of u-City.

Ubiquitous City (u-City) is known as an integrated business with various fields involved and the related officials should form a common ground for the business; for a successful u-City business, many of IT service companies should gain internal competencies on u-City fields as well as on IT industry while continuing innovation effort with new perspectives.

##### 1.2 Purposes of the study

To draw capabilities for successful u-City implementation from an IT service company, this paper was conducted on two levels:

First, success factors from IT service company perspective were drawn to identify competencies necessary for u-City implementation.

Second, essential competencies for IT business were drawn for establishing a foundation for successful and competitive u-City business

#### Chapter 2. Literature Study

##### 2.1 Understanding the concept of u-City

###### 2.1.1 Definition and characteristics of u-City

Prior to definition of u-City, ubiquitous concept should be discussed. According to u-City development and support laws, u-City provides ubiquitous services anytime, anywhere by realizing u-City technologies within a city space to enhance living qualities and competitive force of the city. Im (2005) defines u-City as "a next generation information city that converges cutting-edge IT infrastructure and ubiquitous information services in a city to realize innovative urban infrastructure" [12]. NIA defines u-City as "a new city concept that offers innovation of the existing information infrastructure, better IT services, convenience and safety for more efficient city function and management." Choi et al.(2005) define it as "a ubiquitous computing city connected to electronic spaces of computer-installed environments, objects, etc. for information sharing and communication"[4]. MLTM defines it as "a city in which cutting-edge IT infrastructure is established based on a sustainable urban environment for efficient environment control and initiative resident involvement and cooperation."

Jung (2008) proposed future visions of a city and ubiquitous technologies within an urban space that provides u-IT-based cutting-edge services in real time and optimizes convergence and integration of the city functions to develop a next generation information city in the 21<sup>st</sup> century [18].

For the characteristics of u-City, first, u-City is an IT-applied ubiquitous space. This means providing information anytime, anywhere in real time through IT technologies and IT-based services.

Second, it brings innovative urban living environment. Optimization of urban function convergence and integration leads to innovation of urban living environment.

Third, the goal of u-City is to improve living quality of the citizens. The ultimate goal of u-City is for better living convenience and quality.

Lastly, u-City is a city that grows with residents' involvement and cooperation. The subject is the residents and the city grows by their involvement and cooperation.

### 2.1.2 u-City development

U-City industry in Korea is being currently driven by MOPAS, MLTM and other central ministries and local authorities.

MOPAS focuses on extending services that help the residents directly and announced "u-Life21" as the basic plan for local information system. MLTM is planning to realize the world first u-City of ubiquitous and intelligent space and developing u-City standard models.

For developments in local governments, Seoul proposed u-Seoul vision for ubiquitous-based international business city and established visions in 6 major local areas. Incheon seeks Digital Well-Being and business-oriented city through its u-City. Busan focuses on promoting Busan u-City and securing its global competitive force by pre-occupying the world first u-City. Gwangju, under its goal of building a ubiquitous cultural capital, established its u-City development plan. Daejeon established its u-City development plan as well, under the vision of global hub of science and technology.

## 2.2 u-City strategies for IT service companies

### ◆ Samsung SDS

Samsung SDS established the infrastructure for ubiquitous environment as well as ultra high speed telecommunication network and an integrated control center; the company differentiated the u-services into home, complex and social overhead facility services for efficient service delivery.

### ◆ KT

KT set the future u-city image as a city of better living and better business. For a city of better living, the services were divided into the categories of convenience, health, safety and pleasant environment. For a city of better business, u-City models were established for industrial value chains, more cooperation, industry vitalization and support and more domestic and international exchange.

### ◆ LG CNS

LG CNS established u-City visions for the future city in the 21<sup>st</sup> century, of integrated business, new government and intellectual living. City functions were divided into the public and residential sector.

### ◆ SK C&C

SK C&C established various u-City business

models including u-City model for home network and telematics services; digital home business is being trial-run as a u-City-related business.

## 2.3 Success factors of u-City implementation

Current studies on u-City success factors have focused on the government level, services and infrastructures and management. U-city success factors, infrastructures, u-services, u-City management and u-service-based e-government-related studies were reviewed for identifying success factors.

Jeon (2006) proposed re-investment in infrastructures and technology development by establishing urban infrastructures and new services to utilize advanced technologies and various contents in ubiquitous society for successful u-City development. Advanced networks, ubiquitous sensors and network core technology-applied ubiquitous environment are needed for urban infrastructures and differentiated public services and various additional services for u-City are needed for adopting new services to create new demands. Jeon (2006) also suggested the necessity of establishing flexible urban planning system that responds to growing additional service market and technology development through proposing u-City concept, building u-City, categorizing each business subject and standard integration of applied technologies [35].

Kim, et al. (2007) proposed 14 items in 4 areas of technology, business, profit and policy through u-Business success factors in a study on business validity and evaluation index for u-City Business Models [29]. Jeong(2007) proposed 6 success factors of 'u-Service standardization', 'u-IT technology development', 'infrastructure establishment', 'setting of laws and institutions', 'information protection enhancement' and 'international cooperation'[3]. Kang (2009) proposed factors of improved laws and institutions; u-City model standardization; technology standardization; technology development; information integration and management; clear identification on the business subject; securing financial support; and user demand analysis [34].

Baek et al. (2008) proposed 7 critical success factors including successful business model development; differentiated and enhanced industry strategies; better environment for investment; building infrastructures; securing self-sufficiency; and maximizing affiliation by using Delphi method [32]. Choi (2007) proposed success factors of establishing infrastructures; creating environment for investment; developing business models; maximizing industry affiliations; differentiation of industry developments; strategy enhancement; and policy support [27].

Yoon(2008) proposed success factors of specific and comprehensive plans; establishing integrated development system; government support; improved

laws and institutions; standardization, integration, technologies and R&D support; user-oriented business; creating demand and business environment improvement; profit model development; reducing social impediments; securing budgets, and human resources development [28]. Shin(2007) proposed success factors of technology standardization, technology development, securing human resources; information protection; laws and institutions; creating base of vitalization; and establishing development system among the operating bodies [25].

Jang (2010) proposed success factors of establishing visions; sharing beneficiaries' service experiences; improved laws and institutions; government support; role division by business body; integrated management of service models; tasks, process, development methodologies; technology and service standardization; and growing communication experts [33]. NIA(2008) proposed improving laws and institutions; standard service models; cooperation among the departments; u-City business operation methodologies; and securing adopting original technologies [21]. Kim et al. (2009) proposed success factors of system/network qualities; information qualities; IT service qualities; usability; and trust on the service providers [17]. Hur et al. (2008) proposed success factors of technology levels; business organization characteristics; customer characteristics; and external environment [31]. Oh et al. (2006) proposed success factors of combined efficiency; well-being care; and respect for mankind [22].

Kim et al. (2009) proposed success factors of clarifying the roles of business bodies; improved laws and institutions; developing profit models; core technology development; and establishing self-telecommunication network [1]. Jeong (2008) proposed success factors for ubiquitous-based e-government services in various aspects including institutional, organizational, economic and technological factors [10].

Based on above literatures, table 2-2 summarized success factors for u-City implementation, based on 20 studies in Korea regarding u-City infrastructures, u-Service, u-City management, and u-Service-based e-government.

## 2.4 Core competencies of a business

### 2.4.1 Core competency concept

The theory of core competence advocated a firm with a combination of technologies and knowledge owned by the organizational members; intangible asset is more emphasized than material asset, the members learn how to control various production technologies and how to coordinate the technology flow; it is an unique capability for increasing customer values and more efficient value delivery [5]. Core competency is also a combination of knowledge,

technologies and attitudes necessary for core tasks and accomplishments that realize organizational visions and strategies. It is a measurable behavior that draws successful results based on knowledge, skills, attitudes and interactions of organizational values consistently observed in the members of successful accomplishments [5], [6].

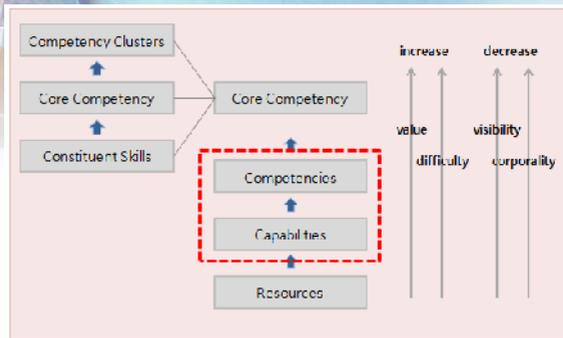
Core competency has various characteristics as listed below:

First, it is changeable [13]. As situations and environments of a company change, core competencies are decided or change accordingly. Second, it is difficult to measure and detect. Collecting information and selecting measuring tools are difficult and systematic framework is required [8]. Third, it shows Inimitability. It also shows Tacitness, Complexity, Speciality and Causal Ambiguity. Fourth, it shows Immobility and Non-Substitutability. Core competency cannot easily move from one company to the next, which makes consistent economic profit available [9]. Fifth, it shows Invisibility. Invisibility makes competitions unable to imitate, which promotes the values even more.

Sixth, it shows Durability, which increases when a competency is shared and applied. It also shows exclusive appropriability (Gilgeous & Parveen, 2001 [9]).

### 2.4.2 Core competency structure

Core competencies on the top level, Resource, Capabilities and Competencies comprise of a 4-level structure and [Figure 2-1] shows the diagram. The first level, Resource, varies in companies; Capabilities indicate abilities of using resources. Capabilities include a series of business activities that manage interactions between business processes and resources (Javidan, 1998 [16]). Capabilities also play important roles that are crucial to company survival, yet cannot offer upper hand within the same industry. The aspect separates Capabilities from core competencies (Pralhad, 1993 [23]). When various capabilities act together through integration of various functions, it realizes Competencies, placed in the level above. Lastly, the last level, Core Competencies, is drawn from interactions among capabilities. Therefore it can be said that Core competencies are a collection of various capabilities [15]. In this study, 'Competencies' or 'Capabilities' will be used to indicate company capabilities, due to the embryonic stage of u-City industry.



[Figure 2-1] Core Competency Structure

### 2.4.3 Company capabilities

Studies on company capabilities have been studied with various perspectives and this study conducted literature study on characteristics of u-City, IT-related ‘innovation’, ‘services’, ‘organizations’ and other IT-related materials.

In their company capabilities study related to innovation, Hult et al. (2002) proposed market-oriented, learning-oriented and enterpriser-oriented capabilities for company innovation in their study on innovation associated with business showings [11]. Yam, in his study on technology innovation capabilities of Chinese companies, proposed learning, R&D, resource allocation, manufacturing, marketing, organization and strategic planning capabilities [27]. There are studies focusing on market, technology, production and innovation; in some of the studies, the categories are market-oriented, R&D-oriented and production-oriented [8].

A study done in Korea suggested the effect of innovation factors and capabilities on manufacturing businesses and proposed the importance of R&D, production and learning.[14]. In a study on service-related capabilities [20], company strategies, customer-oriented marketing, technologies and services, image marketing, stability and financial capabilities were proposed for promoting competitive force of a company.

Traditional capabilities-financial, strategic and technological capabilities-and organizational capabilities-value sharing, management, changing ability and leadership-are considered important for company’s competitive force [7]. Piao (2005) proposed management system, management strategies, marketing strategies, company culture, information system, resource, process, quality, market competitiveness, business accomplishment, new product development, company image, market information, design, R&D, investment, A/S, legal restriction, product prices, relationships, introduction to the market, know-how, constant trust and support, incentive, organization culture and human resources as capabilities of IT companies.

Regarding capabilities of IT companies, Kang

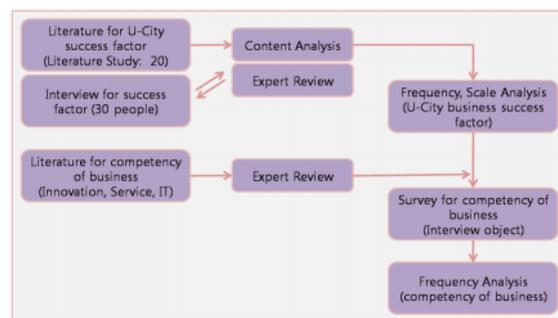
(2010) proposed customer understanding on the business, customer-friendly system management, project experiences and practice, customer-oriented IT consulting service system, human resources, customer and field-oriented service mind, customer leadership, financial stability and sales capabilities [30]. Song (2009) proposed general management, new technologies, specialized tasks, sales and individual personnel as categories of IT business capabilities [26].

## Chapter 3. Research Methodology

In this paper, expert interviews were conducted on 13 IT service companies that run u-City business to verify CSFs and collect additional CSF as shown in [Figure 3-1].

Based on the interviews, literature study was conducted to draw company capabilities necessary for achieving CSFs and deriving capability -related data. Studies on national/international innovation, services, organization and IT-related issues were used to draw capabilities or competencies. Capabilities drawn from the studies were presented as examples and company capability data was established through surveys for identifying company capabilities necessary for achieving CSFs; the surveys were conducted on 30 experts who were interviewed.

Collected data was processed through Content Analysis and literature study and interview results were organized as CSFs; CSF literature study and interviews were processed with Frequency Analysis to define the overall CSFs. Lastly, company capability data collected from surveys was processed with Frequency Analysis to draw major company capabilities according to success factors and categories. Chi-square Test was used to verify the association between u-City critical success factors and company capabilities.



[Figure 3-1] Study Methods Process

### 3.1 Data collection

#### 3.1.1 Literature study on success factors of u-City implementation

For closed study on the interviews, success factors commonly suggested from the existing studies were categorized and organized by ubiquitous

e-government service study model [10] based on BSC(Balanced Scorecard) perspective.

No.	Success factor	Definition	Category
1	Establishing u-City concept and the models	Establishing u-City concept and models based on user benefits and economic effect	Environmental/institutional factors
2	Clear division according to business bodies	Clear role and range division according to business bodies and steps related to various interests	
3	Establishing urban planning system	Establishing integrated planning system through city planning process models	
4	Establishing laws/institutions	Establishing u-City business laws and institutions; maintaining current laws and regulations	
5	Supporting policies	Establishing government-level support system; supporting policies	
6	u-City network infrastructure establishment and advancement	Establishing wire/wireless networks and u-City network; promoting advancement and the quality	Technological factors
7	Developing products, services and technologies	Developing USN, GIS, u-City-related products and services; developing related technologies and fusion technologies	
8	Technology and service standards	Establishing and integrating various technologies and service-related standard systems	
9	Information management and protection	Generating, managing, using and protecting information; promoting qualities; developing related technologies	
10	Developing profit-creating new services	Developing and adopting u-Services that generate added values through public/additional services	Economic factors
11	Establishing and supporting operating cost	Establishing step-by-step project and operating cost support system; consistent financial support	
12	Creating an environment for investment; expanding markets	Vitalizing investment through creating and promoting environment for investment in u-City business; expanding user(customer) market	
13	Establishing clear goals and plans	Establishing clear goals and project plans	Organizational factors
14	Leadership	Executive/manager mindset and leadership for business plan and support	
15	Securing and growing experts	Securing and using experts in each field; training/educating experts	
16	Promoting cooperation and affiliation	Promoting networking for cooperation of the government and project-related businesses/industries	

17	Project management	Effective project/risk management that meets business objectives; improving work process
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[Table3-1] CSFs for u-City implementation

### 3.1.2 Literature study on company capabilities

Among literatures on national/international innovation, services, organizations and IT, ones referring capabilities or competencies were used to draw, examine and organize capabilities. Ulrich (2008)'s model was used to analyze company capabilities; traditional financial, strategic, technological and organizational capabilities were added to the model as shown below [19].

No.	Success factor	Description	Category
1	Financial stability	Credibility, scale and financial stability	Economic/financial capability
2	Investment capability	Business support and investment capability	
3	Profit	Profit-generating ability through company's financial capability	
4	Understanding the markets and customers	Understanding markets, customers and customers' businesses	Strategic/marketing capability
5	Customer leadership	Delivering company values to customers; customer-oriented management and management skill	
6	Sales and sales management	Sales, sales management, sales know-how, sales sense, and related capabilities	
7	Building relationships (Managing partnerships)	Establishing and managing network of stakeholders	
8	Strategic planning	Setting goals, strategies; operating plans	
9	Negotiation skill	Negotiation and contract skills	
10	Developing and operating new businesses	Discovering new businesses; business operating skills	
11	Image marketing	Establishing company/brand image (promotion and advertising)	
12	Developing business models	Developing and establishing business models	
13	Collecting and using information	Information analysis, market research, trend analysis and other capabilities to collect and use information	
14	Competitive prices	Competitive product/service rates	
15	Customer services and follow-up	Follow-up for products and services, customer support system	

16	Consulting capability	Consulting capabilities for customers	Technological capability
17	Service productivity	Service productivity(Service efficiency against cost)	
18	Technology innovation	New technology development and technology innovation	
19	Acquiring and internalizing new technologies	Acquiring, applying and managing new technologies and knowledge	
20	R&D	Establishing technology development competency and the development process	
21	Developing new products and services	Developing competency for new products and services	
22	System development and application	Development/application competency for customer-oriented systems	
23	Specialized level and technologies	Specialized technologies, fields and advanced technology level	
24	Information protection technologies	Advanced information protection technologies	
25	Quality management	Competitive product/service quality, quality improvement competency	Organizational capability
26	Education/training system	Education system for applying and educating new knowledge	
27	Flexibility	Organization flexibility	
28	Human resources	Securing specialists; managing and developing human resources	
29	Organization, and management	Establishing and managing efficient organizations	
30	Team work and cooperation	Team cooperation within a company	
31	Project capabilities	Project experience and practice competency for customers	
32	Understanding and sharing business goals	Understanding and sharing business goals among the members	
33	Problem solving and countermeasures	Handling and solving business issues	

[Table3-2] Organizational capabilities

### 3.1.3 Interviews on CSFs and surveys on company capabilities

Interviews on u-City CSFs were initially conducted on IT experts in u-City business by dividing them into groups of 2~5 people. First, the objectives of the interviews were explained and the interviewees answered questions on the importance

of each factor based on the Likert scale of 7 against CSFs.

Surveys on company competencies were conducted on the experts who participated in the interviews on CSFs for u-City implementation

### 3.2 Method of Data analysis

Analysis on the collected data was completed according to the nature of the data. To quantify qualitative data, Content Analysis was used; data drawn by the Likert scale were analyzed by the mean and variation. Frequency Analysis was applied to analyze the importance of the quantitative data. Correlation Analysis on literature study and the interviews was done by Spearman rank Correlation. To examine the significance of the correlation between the CSFs and company competencies, cross analysis (Pearson Chi-Square Test) was applied.

Content analysis method is to draw valid deductions from the texts by a series of procedures [23]. In this study, additional u-City success factors drawn from the interviews were analyzed and examined whether the factors were included in the ones from literature analysis or those were separate ones. U-City CSFs that reflect the Content Analysis results are as follows.

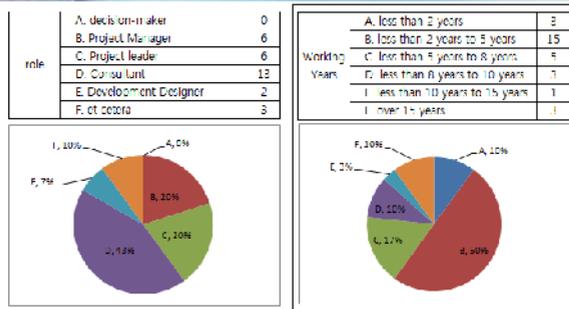
Frequency Analysis is to create Frequency Table by category and variable and proper graph (e.g. bar chart, pie chart). It shows frequency of the variables and relative ratio [2]. Major factors drawn from literature study were used to measure the frequency. It was also used to analyze company capabilities.

## Chapter 4. Data Analysis

### 4.1 Standard data analysis

20 studies on u-City success factors were selected for literature study to draw CSFs for u-City business success factor analysis.

Interviews on u-City success factors were conducted on 30 experts from 13 IT companies from Nov. 17~27, 2010. The companies to which the interviewees belong were limited only to IT companies. Therefore the all subject companies were IT companies. Interviewees included u-City consultants (40%) and u-City project managers/leaders (40%). The length of employment in the field, 72% of experts had worked in the field for 2~8 years and about half of the interviewees had 2~5-year experience in the field since u-City has been developed in Korea for less than 10 years.



[Figure 4-1] Demographic data

4.2 CSFs analysis

This section proposes u-City CSFs drawn from literature study and interviews and organizes “CSFs” after comparison and analysis from two different perspectives.

Expert review to verify validity of the results drawn from literature study and the interviews was done by 2 experts who were interviewed. Major points of the review include: first, securing mutual exclusiveness of CSFs; and second, evaluation on CSFs based on literature analysis and the interviews to draw CSFs for company core-competencies.

Major review results are as follows. U-City success factors proposed by the experts in the interviews reflected the definitions of 17 success factors which are overlapped with 17 success factors drawn from literature study. ‘Leadership’ showed low importance both in literature study and interviews, therefore was excluded from the list of success factors; 16 factors, 1 excluded from the list of 17, were drawn as u-City CSFs.

Success factors were drawn from 20 studies on u-City success factors and the frequency in the studies was examined and prioritized accordingly. Closed interviews were conducted to measure the importance of each success factor based on the 7-point Likert scale. Each success factor was measured for its importance through mean value comparison.

No.	Critical Success Factors	Literature Study Importance	Interview Importance	Category
1	Establishing and supporting operating cost	7	1	Economic/financial capability
2	Supporting policies	10	1	Strategic/market ing capability
3	Developing profit-creating new services	5	3	Economic/financial capability
4	Developing products, services and technologies	3	4	Technological capability
5	Creating an environment for investment; expanding markets	3	5	Economic/financial capability

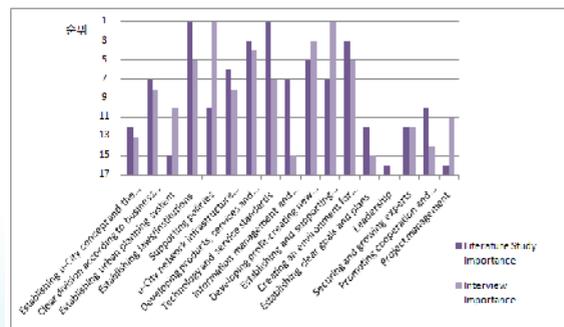
6	Establishing laws/institutions	1	5	Strategic/market ing capability
7	Technology and service standards	1	7	Technological capability
8	Clear division according to business bodies	7	8	Strategic/market ing capability
9	u-City network infrastructure establishment and advancement	6	8	Technological capability
10	Establishing urban planning system	15	10	Strategic/market ing capability
11	Project management	16	11	Organizational capability
12	Securing and growing experts	12	12	Organizational capability
13	Establishing u-City concept and the models	12	13	Strategic/market ing capability
14	Promoting cooperation and affiliation	10	14	Organizational capability
15	Establishing clear goals and plans	12	15	Organizational capability
16	Information management and protection	7	15	Technological capability
17	Leadership	16	17	Organizational capability

[Table4-1] Comparison Literature – Interview

As shown in [Table4-1], literature study showed the most importance of ‘laws/institutions establishment’ and ‘technology/service standards’; ‘product/service technology development, creating environment for investment, expanding markets showed relatively significant importance.

Interviews suggested the most importance of ‘establishing and supporting operating cost’ and ‘supporting policies’; ‘developing new services for creating profit’ and ‘developing products and service technologies’ showed relatively significant importance.

In both literature study and the interviews, ‘establishing laws/institutions’, ‘developing products and service technologies’, ‘developing new services for creating profit’, ‘creating environment for investment’ and ‘expanding markets’ shows significant importance. ‘Supporting policies’, ‘information management and protection’ and ‘establishing and supporting operating cost’ showed significant discrepancy from other categories.



[Figure 4-1] Comparison Literature – Interview

			Literature Study	Interview
Rho of Spearsman	Literature Study	Correlation coefficient	1.000	.610
		Significance probability	.	.009
		N	17	17
	Interview	Correlation coefficient	.610	1.000
		Significance probability	.009	.
		N	17	17

[Table4-2] The correlation analysis results (Comparison Literature – Interview)

[Table4-2] shows the correlation analysis results on priorities of CSFs from literature study and the interviews. The correlation coefficient between two studies was 0.610.

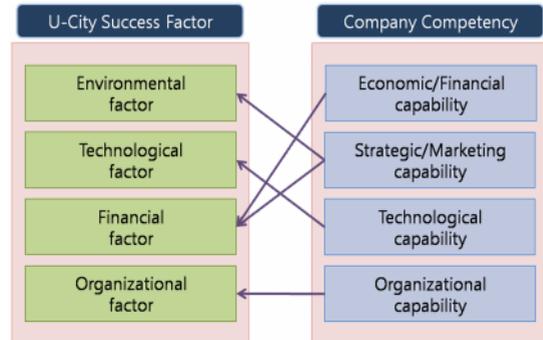
### 4.3 Company competency analysis

Chi-Square Test was used to verify the association between u-City success factors and company competency factors. Chi-Square value was 605.523; degree of freedom was 9; and p-value was 0.000. And u-City success factors and company competency factors showed association, which was shown in [Figure 4-3] below.

			Economic/financial capability	Strategic/marketing capability	Technological capability	Organizational capability	Total
			Success Factors	environmental factors	frequency	29	218
expected frequencies	42.3	161.4			119.4	96.0	419.0
technological factors	frequency	20		95	243	51	409
	expected frequencies	41.2		157.5	116.5	93.7	409.0
financial factors	frequency	105		152	61	27	345
	expected frequencies	34.8		132.9	98.3	79.0	345.0
organizational factors	frequency	12		169	67	225	473
	expected frequencies	47.7		182.2	134.8	108.3	473.0

Total	frequency	166	634	469	377	1646
	expected frequencies	166.0	634.0	469.0	377.0	1646.0

[Table4-3] Success Factor – Company Competency correlation chi-squared verification cross tabulation

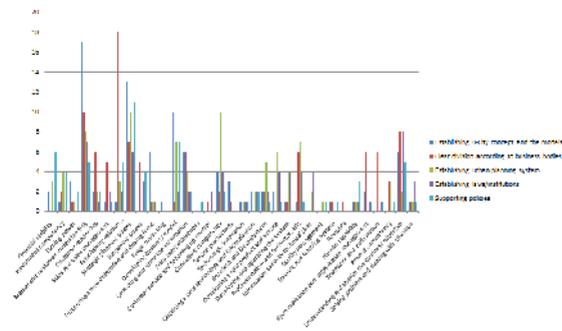


[Figure 4-3] Correlation between Success Factors and Company Competencies

In achieving each u-City success factor, there were core company competencies, which were shown in the association analysis results below:

#### ◆ Environmental/institutional factors

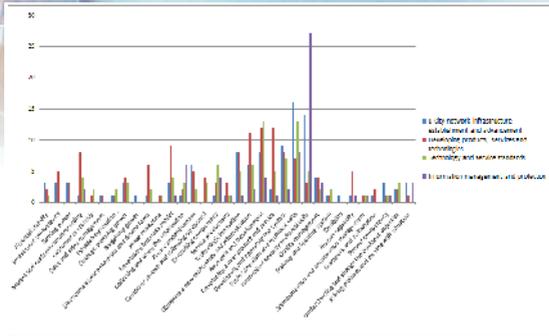
To achieve environmental/institutional CSFs, customer environment, fast-responding markets, customer understanding, strategic planning and practicing capability are important. To actively responding to the institutional chances, consulting and business model development are the important factors.



[Figure 4-4] Company competency in Environmental /institutional factors

#### ◆ Technological factors

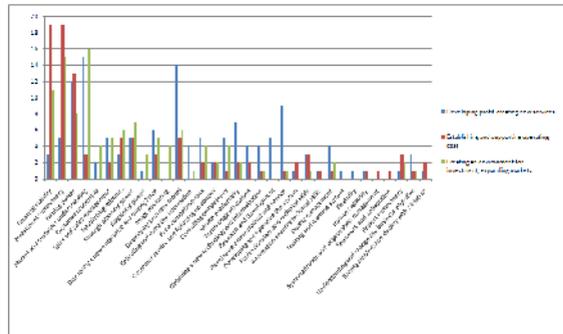
To achieve technological success factors needed for comprehensive and innovative technologies and services, it is important to develop specialized technologies and R&D activities. Since most services use customer information, information protection and protection technologies are also needed. Technologies for new products and service development are also important.



[Figure 4-5] Company competency in Technological factors

◆ Financial factors

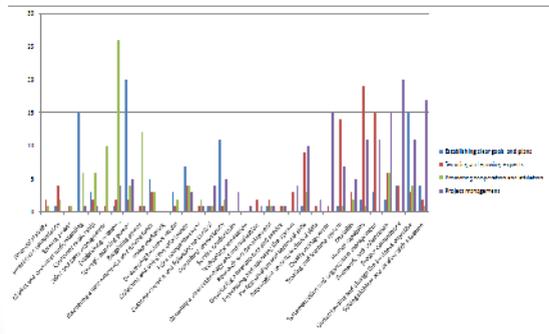
To develop u-City business for IT companies in terms of large city development, financial factor was considered the most important; to achieve the business goals, maximizing profit through financial stability, investment and financial competency was considered the major competency. Understanding markets and customers, business model development were also considered important for creating profit and markets.



[Figure 4-6] Company competency in Financial factors

◆ Organizational factors

To achieve organizational CSFs in u-City business-running IT companies, various company competencies are required.



[Figure 4-4] Company competency in Organization factors

Chapter 5. Conclusion

5.1 Conclusion and implications

This study examined u-City CSFs from IT company perspective and drew company competencies necessary for achieving the CSFs. Through literature study and interviews with experts, 16 CSFs were identified, each CSF was treated by Frequency Analysis to draw company competencies necessary for achieving each CSF; and the significance on company competencies necessary for successful u-City implementation was proposed. This study concluded with two aspects: CSFs and company competencies.

U-City CSFs from the company perspective implicate 4 aspects through literature study and the interviews:

First, new technology development that brings new values, products and services to the customers is important. Products/services developed for u-City business are still not u-City business exclusive but a mere conversion of technologies and the existing IT services. In addition, u-City technology concepts introduced so far need more time and study before the actual commercialization. Therefore new technology development will bring commercialization and u-City business success sooner.

Second, new service development is needed to create profit for growing u-City business. In case of u-City in Dongtan, substantial service contents are still insufficient for the residents in the area to experience besides a few basic public services, which causes low satisfaction level on overall u-City business and skeptical views on the business. Long-term service development through industry convergence is needed to vitalize u-City business.

Third, cost system should be established for building and operating u-City. U-City Dongtan is complete and using the system, yet it doesn't have proper financial support. Substantial, consistent new service development is needed to maintain financial support for u-City operation.

Lastly, laws, institutions and governmental support are needed to vitalize u-City business. Local u-City government network-related laws, CCTV laws, outdoor advertising laws, business laws are hindering u-City business. Laws and regulations should be revised to be more favorable to vitalizing u-City business. Various types of support have been made to vitalize u-City business on the government level, which should be consistent and systematic to settle and stabilize the business.

Necessary company competencies to achieve CSFs were drawn from surveys conducted on experts; important company competencies were drawn by Frequency Analysis on company competencies; and the implications below was the results:

First, financial support, government support and profit-generating service development are considered

more important than technology standardization and business organization ability for successful u-City business.

Second, large scale investment in urban development, which has been new to IT companies, and understanding of the public demand and market change are considered the most important in operating u-City business.

Third, understanding of market change and the public demand, strategic plans, operating ability, immediate response to the demands are needed to improve government support, laws and institutions.

Fourth, specialized technologies and technology advancement should be maintained.

Fifth, capabilities in various fields are needed to achieve internal success factors of a company.

To summarize the implications mentioned above, IT companies need to secure financial and investment capabilities, which are unfamiliar to many IT companies, to run u-City business. Also, extending the view point from IT perspective to u-City perspective will be helpful to focus more on the public demand. More active involvement with government policies and securing various capabilities should follow in strategic priorities.

## 5.2 Limitations and further suggestions of the study

Limitations and further suggestions of the study are as follows:

First, more experts are needed in the interviewed companies and the interviews should be done on more companies. Second, this study is limited to u-City industry exclusively in Korea. More studies should be done on various cases in other countries and global companies. Lastly, similar studies not only on IT companies but also on stakeholders of u-City business in various fields should follow to draw more comprehensive results on factor/competency analysis.

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