

Identifying Critical Success Factors for Labor Flexibility in the Non-face-to-face Service Industry

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Abstract

The primary purpose of this study is to identify the success factors for the design and development of home-based call centers. Both Delphi and survey methods were adopted to conduct this research. This study included 13 participants with experience in working from a home-based call center. The Delphi method is designed as a group communication process, which aims for the convergence of experts' opinions on a specific real-world issue and extracts important factors in a structured manner. Content Validity Rate(CVR) invented by lawshe(1975) was used to judge the most effective factors.

Using the Delphi method, the major criteria were grouped into human resources characteristics, physical resources characteristics, organization characteristics and job/task characteristics and 46 factors, including (1) agent's sense of responsibility, (2) security systems equipment, (3) special career development program for home-based agents, and (4) simplicity of job/task, were identified.

The findings of Delphi will be the starting point for next step of verification. The results of this study would provide practical guidelines to the home-based call center workers and a wider perspective to the researchers on the subject.

Keywords : Home-based work; Flexibility; Service Innovation; Social Exchange Theory; Kano Model; Capacity Management; Call center service.

I . Introduction

Service industry is one of the largest and fastest growing sectors of the Korean economy. It is the basis of national growth and employment. Even though the service sector accounts for 70% of the domestic employment, its productivity is less than the manufacturing sector by 40%. The labor productivity of the South Korean manufacturing sector ranks 5th among the 19 OECD nations whereas, the labor productivity of the service sector ranks 18th. Moreover, the productivity of South Korean service industry is less than half of that of the U.S. service industry [1]. Therefore, improvement of the service productivity is a serious issue.

Call Center services, one of the major non-face-to-face customer services, also suffer from low productivity. The call fluctuation gap is very big. The call volume gap between the peak hours and non-peak hours occurred in a day in the call center is as much as 125 times[2]. Thus, appropriate staffing becomes difficult for the managers. If the call center is understaffed, customer satisfaction would decline and agents would burnout; if the call center is over-staffed, an increase in the idle time will lead to lower productivity.

The U.S. transferred its call center operations offshore to improve productivity by cutting operations cost. However, due to the constant annual increase in wages and inflation of the offshore countries, both effectiveness and efficiency were reduced. Customer complaints regarding the misinterpretation of queries by the offshore agents and cultural differences also increased. Consequently, many companies transferred their call centers back to the US and changed them to home-based operations [3,4,5]

Home-based work in call centers is increasing rapidly in the US to reduce operation costs. Contact Babel [6] finds that there has been an annual increase in the number of home-based call centers since 2007 and that 42% of the US call centers adopted the home-based model in the year 2011.

Home-based model is an innovative way to raise the productivity of a call center [7]. There are three main reasons for the increased productivity in the home-based model: First, home-based call center agents are usually more skillful at resolving customer inquiries and can handle more calls than the office agents. Companies thus, staff them during the peak period when there are more chances of getting customer calls. Second, home-based agents show lower attrition than office agents, thereby, reducing the initial training and recruitment

fee. Third, as home-based agents do not need office space and furniture, seat cost per agent is reduced [8].

Whilst home-based model has many advantages, it may not be appropriate for all the organizations. Organizational structure, organizational support, home-based agents characteristics, task type, equipment, and systems may affect the success of a home-based call center. Hence, we aim to verify if the home-based call center is more productive using the South Korean sample, and identify the success factors for the design and development of home-based call centers.

The purpose of this study is majorly two-folds. First, to confirm that home-based work has better performance than the office work and second, to investigate the factors which influence the performance. In order to develop the model, a combination of two methods was applied: a Delphi study, to identify the success factors, and the survey method, to verify the factors, which influence the performance, thereby answering the following questions:

- 1) Does home-based call center have better performance than the office-based center in South Korea?
- 2) What are the success factors to leverage the performance of home-based work?
 - a) What are the human resources characteristics that would predict successful outcomes in a home-based call center?
 - b) What are the physical resources characteristics that would predict successful outcomes in a home-based call center?
 - c) What are the organizational characteristics that would predict successful outcomes in a home-based call center?
 - d) What are the job/task characteristics that would predict successful outcomes in a home-based call center?

II. Background & Literature Review

2.1 Home-based work(HBW)

Home-based work is a nontraditional working arrangement in which work duties are performed from home for most of the working time. It is the most popular form of telework. Teleworking is working remotely from a traditional place of work, for a significant proportion of work time [9]. It usually covers jobs such as, telemarketer or call center agents, data entry clerks, accountants, architects, consultants, insurance agents, lawyers, and computer programmers

[10]. It can be divided into four types: home-based work, “satellite office, where work is done at remote offices controlled by the employer, telecenters, where employers provide information technology and rent the work space for their employees from a given community, and the mobile telework, where employees are usually travelling and/or spending time on customers’ premises, and may be equipped with laptop computers and mobile phones to support their mobile work” [11]. In South Korea, the terms Smart work, Telework and Home-based work are used equally for telework.

Toeffler [12] said that home-based production, which resolves organizational, societal, and individual problems, would spread with technological advancement. Nowadays, a large number of people work from home and the trend has been increasing steadily for several years.

In the U.S., ACS (American Community Survey/Census) data showed that the number of home-based workers grew by 61% between 2005 and 2009. Forrester Research [13] predicted that 63 million people in U.S. would work from home by 2016. President Barack Obama signed the Telework Act of 2010 into a law, thus, giving 1.2 million federal workers the option to telecommute for at least part of their working time.

In South Korea, the Korea Communications Commission announced in 2011 that smart-work including home-based work will be promoted to build a global smart-work country through work-life balance. It aims to have 30% of the employees work from home, satellite centers, or mobile offices by 2015 (Korea Communications Commission Homepage). Ministry of Employment and Labor will set up the guidelines for the adoption and execution of smart-work and distribute smart work guidebook to the HR managers (Ministry of Employment and Labor Homepage).

2.2 Home-based work in call center

1) Company requirements and capacity management issue.

Capacity management in the service industry is more complex and important than in the manufacturing industry. Production and consumption in the manufacturing industry can be balanced by managing the inventory and backorders. However, in case of service industry, worker’s time itself is the inventory and so, it is not possible to stock the inventory when the production exceeds consumption, or provide back-orders when the consumptions exceed production [14].

Call center consumption, that is, the call volume is characterized by a very

highly variable pattern (Fig. I). Level strategy to respond to high volume levels (targeted peak time) may result in increased idle time and poor resource utilization. Level strategy to respond to low volume levels (targeted non-peak time) may result in increased customer complaints regarding longer waiting times and poor service levels. Hence, service companies continuously strive to strike a balance between consumption and service capacity [15].

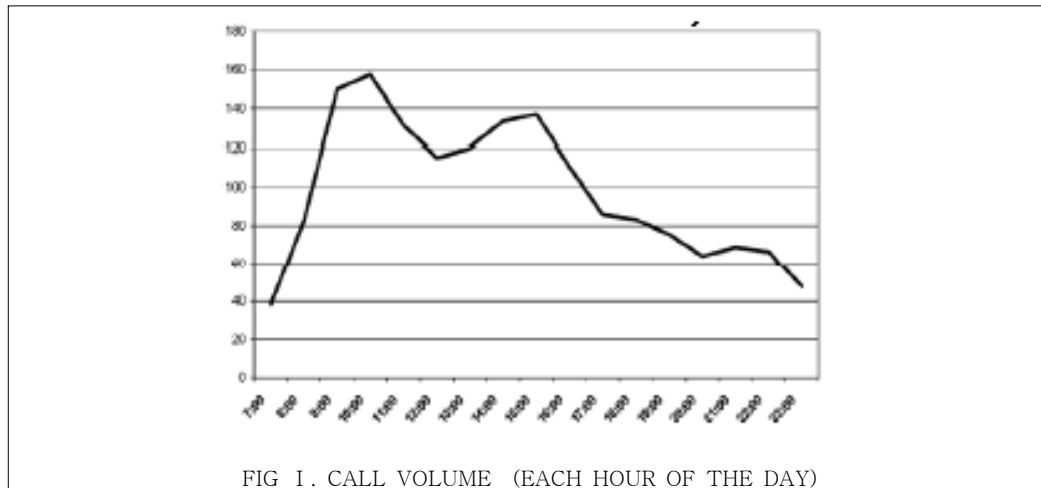


FIG I. CALL VOLUME (EACH HOUR OF THE DAY)

However, more personnel means lower returns. As shown in Fig. II, diminishing returns from the increase in staffing are apparent [16]. While service level increased from 0.70 to 0.80, required full time equivalent personnel increased only by 7 (382–375). When the service level increased from 0.80 to 0.90, the number of required personnel increases by as much as 11 (393–382). That is, maintenance and achievement of high service levels with full-time employees is costly for operations.

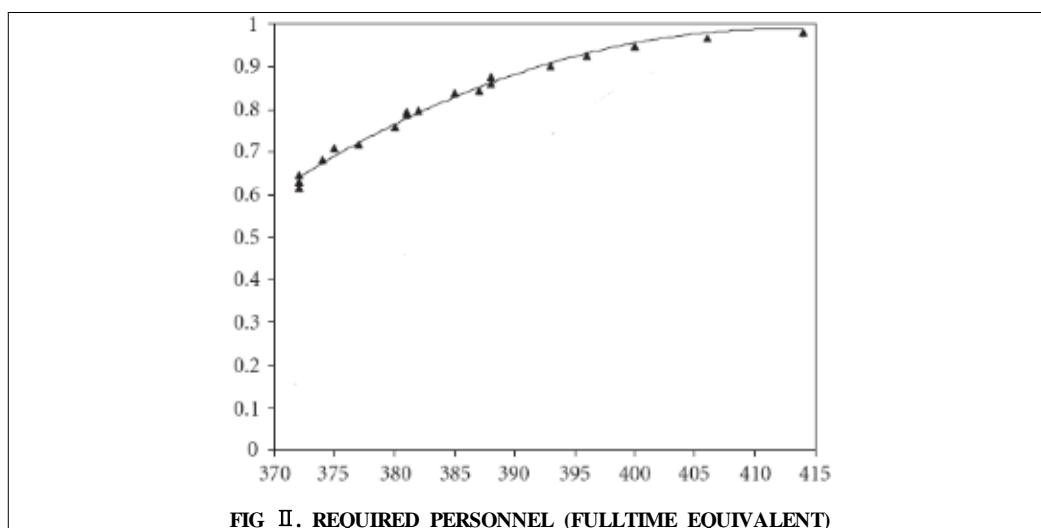


FIG II. REQUIRED PERSONNEL (FULLTIME EQUIVALENT)

From the previous review, we can conclude that flexible workers help in attaining higher level of service while maintaining high productivity at the same time. However, if the peaks are too short, it is not easy to call in agents for this short working time [17]. Even if the wage per hour is higher than the full-time workers, the additional cost to commute is high. Thus, extra flexible workforce like home-based workers outside the office is beneficial.

2) Agents Requirements and Social Exchange Theory.

Social exchange theory provides the dominant theoretical basis for the commitment of home-based workers. Social Exchange Theory suggests that the employee who receives benefits from the organization, like flexibility in work time or place, shall feel obligated to return the favor to the employer in the form of negotiated or reciprocal exchange.

Most call centers usually hire more females than males as ordinarily they have a non-threatening attitude and voice. The ratio of females in the call centers is approximately 71% in the world and almost 90% in South Korea [18].

Women feel stronger work-life conflict than men. Work-life conflict affects job satisfaction negatively [19]. Work-life conflict affects organization commitment and life satisfaction negatively and intent-to-leave the company positively for the South Korean married working woman [20].

The average turnover rate of call centers is approximately 30% in North America [21]. In South Korea, the average turnover rate is approximately 20% and is much higher than the industry average [22].

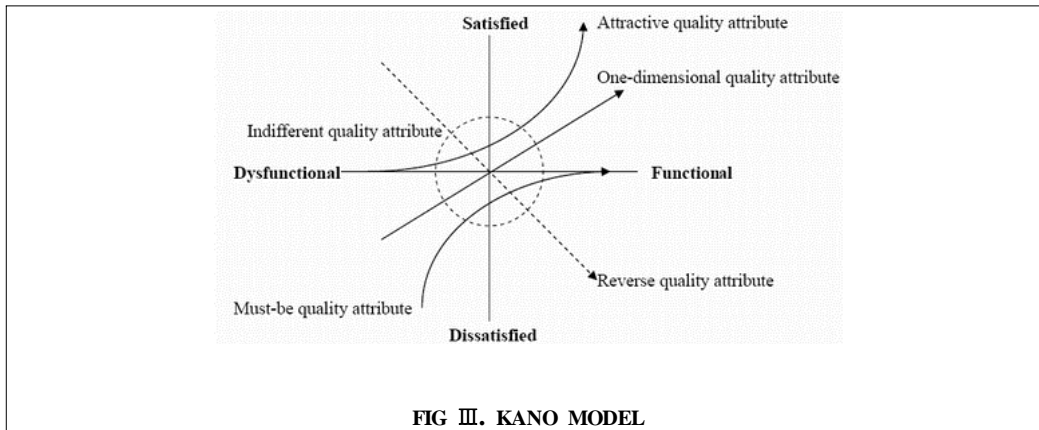
Benefits like flexible timings and work place would encourage working woman to be more committed to their work and organization, and will reduce turnover rate.

3) Company requirements and capacity management issue.

KANO model, designed by a Japanese Professor Dr. Noriaki Kano, classifies service attributes into three key categories (attractive quality attribute, must-be quality attribute, and one-dimensional quality attribute)[23]. The must-be requirements are the dissatisfiers, which can alter the basic needs. One-dimensional requirements are satisfiers that can be viewed as performance needs. The attractive requirements are delighters, which can be considered excitement needs. Customers assume the dissatisfier factors to be provided and are immediately dissatisfied in their absence. Satisfier factors will usually be obtained during traditional marketing research, while delighters represent positively viewed service features that are not anticipated or expected by the

customer.

As shown in Fig. III, over time delighters might become satisfiers and satisfiers might become dissatisfiers. That is, customer expectations change over time [24]. Therefore, retention of an experienced agent becomes even more important to meet expectations of customer.



2.3 Home-based work in call center

The success factors for home-based work can be classified into four categories [25]: human resources, physical resources, organizational characteristics, and task characteristics.

Not all agents are good at home-based work. According to previous studies, home-based workers are more likely to be self-motivated, able to work alone, tenacious, self-confident, skillful in time management, sincere, and have low social needs [10,26].

Olson [26] interviewed 32 employees and their 8 managers and found that home-based workers tend to be self-motivated, skillful, and avoid social interaction beyond work and family. Most workers chose home-based work for family and followed a very strict routine similar to a regular work place, even though there were no obligations from the company.

Lim & Teo [27] examined the demographic characteristics such as gender and marital status, work-related attitudes such as organizational commitment and job security, support factors, and perceived advantages and disadvantages of teleworking and the effect of organizations on the workers' attitudes towards teleworking by interviewing 285 IT professionals. People who are married and perceive teleworking as far more advantageous are more favorable to teleworking as compared to ones with high level of job insecurity and who associate more

disadvantages with teleworking.

Baruch [28] interviewed 62 teleworkers from five companies in the UK on their experience with teleworking and identified following success factors: 1) match between work and family demands, 2) sufficient space at home, 3) no need for physical presence in the office, 4) personal qualities and circumstances that suit teleworking, and 5) supportive organizational culture. While time management skills and the ability to keep touch through the Internet are required personal characteristics, technical skills were not considered important. Age and presence of children were also found to be important factors. Some researchers argue that the success of teleworking was not affected by the characteristics of workers but by their environment[28].

On comparing the impact of telework between the private and public sectors, Cooper & Kurland [29] find that professional isolation of teleworkers is strongly associated with employee's learning, interpersonal networking with other employees in the organization, and mentoring from colleagues and superiors.

Gajendran & Harrison [30] performed meta-analysis of 46 studies on 12,883 employees for the positive and negative consequences of teleworking. Telework affects perceived autonomy, work-family balance, job satisfaction, performance, turnover intent, and role stress positively. Contrary to the previous studies, teleworking does not have any straightforward, adverse affects on work relationships, or perceived promotion opportunities, but a strong intensity of telework strains the relationship with colleagues.

Tung et al. [31] identified and ranked the motivators for teleworking in the order of time flexibility, reduction in child care costs, time/cost savings of telecommuting, savings of clothing expenditures, and increased job satisfaction. Drawbacks of teleworking are ranked in the order of impediments to career growth, social isolation, conflict between work and home, increase in the equipment cost, and lack of professionalism.

Some researchers argued the importance of providing appropriate IT infrastructure to the home-based workers and proper communication between workers and manager.

Gupta et al. [32] identified the patterns of computer and communication technologies usage by studying 375 teleworkers. Computer, modem, fax, electronic mail, credit card verification, multiple phone lines, and computer information network usage levels were measured. They found that highly educated employees are more likely to use computer and communications technologies and individual background, employment, residential, and occupation characteristics determine the usage of these technologies.

Belanger et al. [33] investigated three constructs believed to affect teleworking performance, such as availability of IT, communication technologies,

and communication patterns of teleworkers. The results indicate that technology affects productivity, performance, and employee satisfaction positively, whereas work group communications affect perceived productivity and performance negatively.

Many studies argue that supportive organizational culture and role of teleworker managers are important organizational characteristics [34]. The authors emphasize that managers should be emotionally and technically supportive, communicative, and result-oriented [10].

Fonner & Roloff [35] investigated the relationship between teleworking factors and job. The study finds stress of meetings and interruption, perceived organizational politics, information exchange, and work-life conflict as the most important factors that influence job satisfaction. The frequency of information exchange relates negatively with the telework, but positively with the associated management of the work-life balance, lower stress levels from interruptions, and less exposure to self-interested and unjust behaviors.

Tasks that either require low levels of autonomy, are simple and easy to control remotely or need high level of autonomy and are complex are the two types that are fit for telework traditionally [34].

2.4 Home-based work in call center

B2C customer service mostly utilizes non face-to-face media, such as telephone, visual (video) telephone, SMS, email, SNS, and twitter with the decreased costs of telecommunications and development in information technology. Call centers are usually responsible for most of this non-face-to-face communication mentioned above .

Inbound call centers account for a large and growing part of the global economy. Approximately, 80% of a firm's interaction with its customers is through the call center. Because call centers now serve as the "public face" for many firms, there is increasing executive consideration of their critical role in customer acquisition and [36].

Moreover, a call-center based study is important to help working women address the stress of work-life conflict as most call center agents are females, who tend to experience more stress and more work-family conflict. Specially, the number of female agents in South Korea is higher than the world average by 20%.

Further, even though there are approximately 2,100 home-based agents in South Korea [7], only approximately 10~20% of these belong to the 12 companies that have adopted home-based call center model. In contrast, 65% of

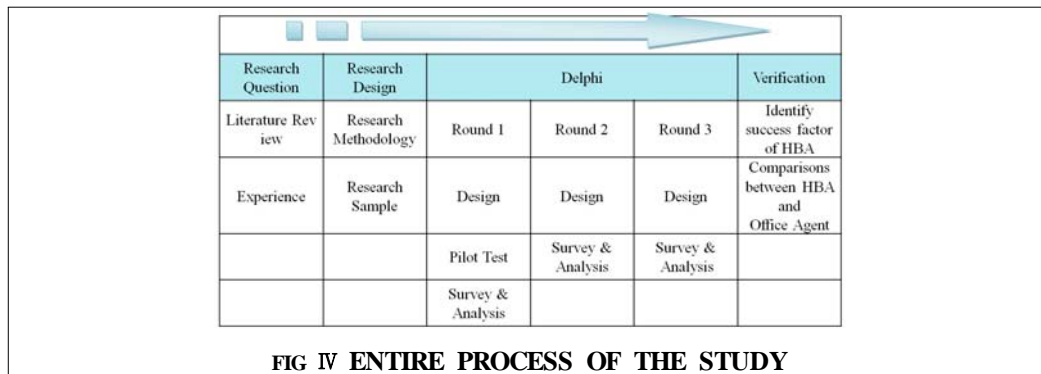
the call centers offered some form of flexible work arrangement to their employees globally [18], and 42% of the call centers in the U.S. have adopted home-based model [6]. Thus, the proportion of home-based call centers is very small in South Korea and has immense possibility of growing further.

Further, call centers provide accessible data on several factors such as talking time, login time, call per hour, etc. that can help yield more fruitful and meaningful results from the study.

III. Research Methodology

We use two research methods– Delphi(Qualitative) method and Survey(Quantitative) method – to process this study (Fig. IV). Delphi method is the selected research tool to collect the judgments of experts in a group decision making setting. As earlier studies recommend further verification and elaboration of Delphi results[37], to find related series of research questions, we use multiple regression analysis with survey to verify and elaborate the Delphi results. And to compare the performance difference between HBA and OA, we use ANOVA(Analysis of Variance).

The first phase of research took place from August to December 2012 and the second phase was conducted from March to April 2013.



3.1 Delphi Study

1) Research Design

The literature on Delphi suggests two to four rounds for designing a Delphi based study [38,39]. We chose three rounds to balance the duration of research,

refine ideas from iterative process, and control the feedback process.

Development of initial questions needs care and attention since the respondents may not be able to answer appropriately if they do not understand the question. To overcome this issue, two of the most knowledgeable managers among the experts group were chosen for a pilot test. One of the managers received service innovation prizes for adopting the home-based model within the organization and the other was invited as a speaker at the call center conference on the best practices for home-based call centers.

We developed 57 questions on the basis of expert reviews (TABLE I). Questionnaire consisted of structured questions with additional columns to collect comments/opinions of experts beyond the asked questions. The structured questions were used to diminish the consequences of 'open-ended' questions that usually draw small and limited answers.

Re so ur ce	Hu ma n Re so ur ce s	Individual circumstances: age, marital status, burden of raising children, commuting time	Baruch (2000), Lim & Teo (2000), Fonner & Roloff (2010), Tung <i>et al.</i> (1995)
		Career characteristics: company tenure, agent tenure, home-based agent tenure	Tung <i>et al.</i> (1995), Fonner & Roloff(2010)
		Personality: Challenging spirit, sense of responsibility	
		Individual Perceptions: conflict within organization, Avoiding career gap, office work satisfaction, feeling of isolation	Lim & Teo (2000), Cooper & Kurland (2002), Tung <i>et al.</i> (1995),Olson(1983)
		Attitude: Meaning of work, work centrality, family centrality	Poissonet (2002), Olson (1983)
	Ph ysi cal Re so ur ce	Security System: Information Data Security, Voice Data Security, Recording file security	Tung <i>et al.</i> (1995)
		Agent support system: online training, knowledge management system, remote IT assist, WFM system, HR system (HR Data and Payment)	
		Communication system:	Olson (1983)
		video conference system, teleconference system, community system,	

		real-time monitoring and barge-in system,	
		Agent Requirements: Independent work place, broadband internet connection	
Processes	Organizations	Organizational structure: Independence of home-based team, Helpdesk/IT team for home-based team, narrow span of control	
		Organizational support: Manager's organizational capability, manager's communication style, technical support, social support, manager's leadership style, specialized incentive scheme, Same training opportunity with office agent, Timely feedback/communication from manager, Frequent feedback/communication from manager	Lim & Tel (2000), Daniels (2001), Olson (1983), Fonner & Roloff (2010), Poissonet (2002)
		Organizational situation: High ratio of applicants hired, High attrition rate, adoption within whole organization	Tung <i>et al.</i> (1995)
	Task	Task simplicity, Narrow scope of task, Task Identity, Frequent recency of task	Poissonet (2002)
		Call type: Inbound, Outbound, Blended	

2) Research Sample

Selection of the industry experts is a critical component of the Delphi method because results are based on their insightful opinions. The experts are selected based on four factors: knowledge and experience on the research issue, willingness to participate, sufficient time to participate in the research seriously, and effective communication skills. Since expert opinion is sought, a purposive sample is necessary where participants are chosen not to represent ordinary people, but for their expert ability to answer the research questions.

In South Korea, only 12 companies adopted the home-based model of call centers in telecommunication, insurance, home shopping, and logistics industries [7]. As we had to collect the opinions of people who are experienced and experts in managing home-based call centers, target sample was quite limited.

We recruited 13 experts, experienced in managing home-based call centers and willing to participate voluntarily, from 8 organizations representing different industries like telecom, insurance, and home-shopping, for the Delphi study (TABLE II).

Table II List of Panelists

Name	Gender	Industry	Experience(years)	
			Call Center	Home-based work
Kang	M	Telecom	11	1
Kim	F	Insurance	5	2
Nam	M	Telecom	8	2
Moon	M	Telecom	12	5
Park	F	Retail	6	6
Park	F	Telecom	12	3
Park	F	Telecom	11	5
Sohn	M	Insurance	11	2
Lee	M	Telecom	7	5
Lee	M	Insurance	9	5
Jung	M	Retail	9	6
Han	F	Retail	9	1
Lee	F	Retail	9	1
Kang	M	Telecom	11	1
Total			119	44

3.2 Survey Study

1) Research Design

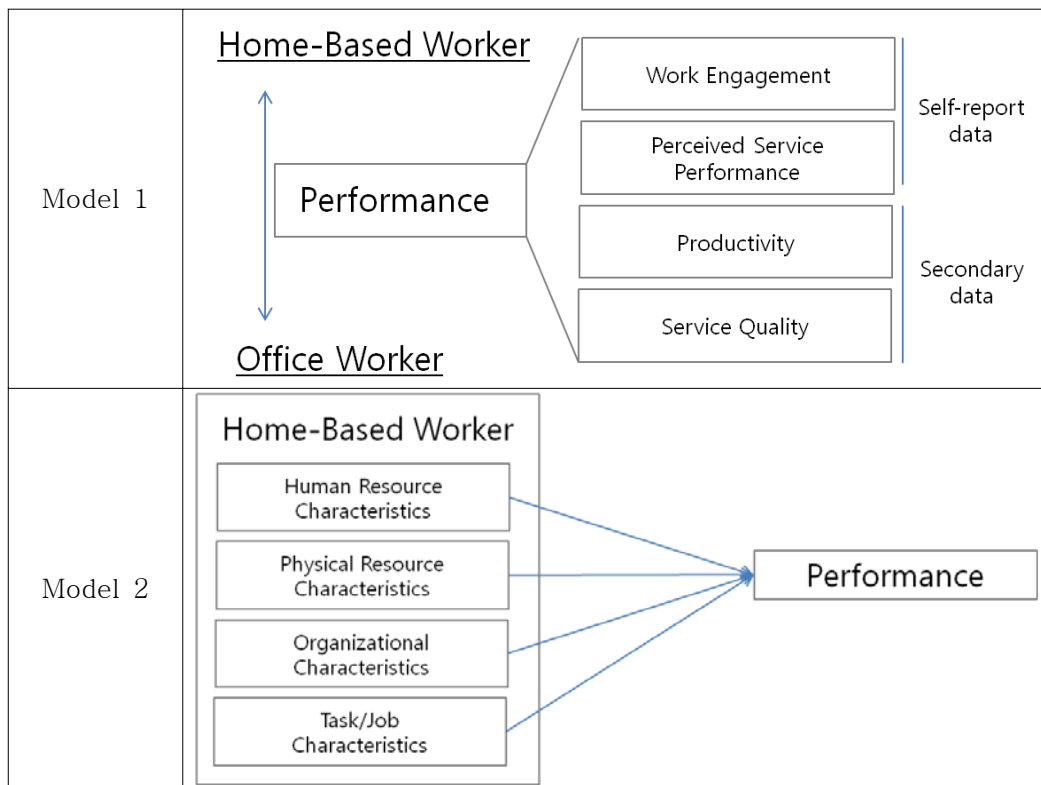
This survey study aims to identify success factor for HBW and compare the performance difference between HBW and OW. A survey consisting of structured questions was administered to the treatment group (HBW) and control group (OW) accordingly. The items were on a 7-point scale using an equal interval answer format except in those cases in which the characteristics of the items did not fit this.

As a method of analysis, we use ANOVA to ascertain that the performance of

HBW is different from that of OW. And to identify the antecedents of home-based work performance, we use Multiple Regression Analysis which can process many independent variables at a time.

The analysis was conducted using SPSS version 15.0.

Conceptual Model of this study



2) Research Sample & Procedure

The population was the 12 call centers which adopted home-based work in South Korea. 3 company were selected by their organizational experience for home-based work(long experience : more than 7 years, medium experience : 3-7 years, short experience : less than 3 years). Respondents were front-line workers(that is, call center agent) responsible for customer service.

Data were collected from both self-reported questionnaire and secondary data of respondents performance.

Home-based workers and office workers(non-home-based workers) in call center of Insurance, Telecom and Home-shopping industry. Survey participants were contacted by managers of each company. All managers were previous

Delphi study participants. They select participants randomly by team unit not individual unit. And \$2 e-Gift card was provided for a token for appreciation. A few phone calls or e-mail were made to ascertain somewhat illogical responses or complete missing ones.

3) Variables

Independent variables

Independent variables are elicited from delphi results. Items that was shown significant was selected as a independent variable for survey study.

5 variables from Human Resource characteristics, 7 from Physical Resource characteristics, 6 from Organizational characteristics and 5 from Task/Job characteristics were used as a independent variables.

Dependent variable – Performance

Most empirical studies on home-based work use self-reported surveys to collect data from the home-based workers. However, the gap between the perceptions and the actual behavior is very significant. The self-reported surveys could have many problems, such as common method bias in the research [40]. Respondents tend to exaggerate performance on self-evaluation. Therefore, in this study, we not only surveyed home-based agents but also gathered the real data on respondents' performance such as, number of calls per hour, and service quality score.

IV. RESULTS

4.1 Delphi Study Results

1) Results of Delphi Round 1 & Round 2 Questionnaire Development

The Round 1 Questionnaire is administered to the Delphi participants and the data obtained from the completed questionnaire is analyzed according to the qualitative coding and statistical summarizing methods.

The responses obtained in Round 1 form the basis of developing the questions for the Round 2 questionnaire. The results of Round 1 were analyzed using the respondents frequency. From the Round 1 responses, 10 questions were added, 1 question was deleted, and 7 questions were modified to improve clarity (TABLE III). As the result, a total of 64 questions were selected for Round 2.

TABLE III . Results of Delphi Round 1

Delete	Human Resource	Age
Add	Human Resource	Time management skills
		Spontaneous level of home-based worker
	Physical Resource	Agent performance system
		Online test system
		Real-time communication system (such as messenger or chatting)
	Organization	Specialized career program
		Various working schedule
		Various offline meeting to feel sense of belonging
		Specialized home-based supervisor training program
		Clear transfer process set-up beyond my job description

2) Results of Delphi Round 2 & Round 3 Questionnaire Development

The Round 2 questionnaire is distributed to the participants for approximately two weeks. All of the respondents from Round 1 also contributed to the Round 2.

The respondents were asked to rate the importance of the various factors in answer to the question, “How do you think that each of the following items is important to home-based call center success” on a seven-point scale (with 1= strongly important, 4= neutral, and 7= strongly agree).

The lowest rated items that received less than 30% importance are challenging spirits, narrow span of control, adoption within whole organization, and blended call type (TABLE IV)

TABLE IV Results of Delphi Round 2

Delete	Human Resources	Challenging Spirits
	Organization	Narrow span of control
		Adoption within whole organization
	Task	Blended call type

3) Delphi Round 3 and final results

The Round 3 Questionnaire uses the responses from the Round 2. After the deletion of four questions, 60 questions were asked in Round 3. For each of the 60 home-based call center characteristics, the group's average importance rating and the range between the 1st and the 3rd quartiles of round 2 was shown and the respondents were asked to re-rate the characteristics after reviewing the opinion of others. The survey participants are given the opportunity to change their ratings and if their rating is outside of the quartiles, they were asked to provide the reasons for their significantly different evaluation from the other reviewers [38].

To validate the results, we use the CVR (Content Validity Ratio) value, which was devised by Lawshe [41].

$$CVR = \frac{n_e - N/2}{N/2}$$

Where: n_e = number of panelists indicating "essential" and N = total number of panelists.

When fewer than half the number of panelists rate as "essential," the CVR is negative. When half of the number of panelists say "essential" and half do not, the CVR is zero. When all the panelists say "essential," the CVR is computed to be 1.00. The CVR is useful in deciding which item to reject and which to retain. A CVR value is computed for each item.

When the Delphi panel is composed of 13 members, a minimum CVR of 0.54 is required to satisfy the five percent significance level (TABLE V).

TABLE V Minimum Value of CVR

No. of panelist	Min. Value
5	0.99
7	0.99

10	0.62
13	0.54
15	0.49

The overall responses to Round 3 are shown in TABLE VI.

TABLE VI. RESULTS OF DELPHI ROUND 3

Human Resources (16)	Sense of responsibility	1.00	More than 0.54
	Time management skills	1.00	
	Family and vacation/leisure centrality	1.00	
	Burden for raising children	0.85	
	Meaning of work	0.85	
	Work and society/community centrality	0.85	
	Spontaneous level of home-based worker	0.85	
	Commuting time	0.23	Lower than 0.54
	Agent tenure	0.23	
	Feeling of isolation	0.23	
	Office work satisfaction	0.08	
	Company tenure	-0.38	
	Marital status	-0.85	
	Home-based agent tenure	-1.00	
	Conflict within organization	-1.00	
	Avoiding career gap	-1.00	
Physical Resources (17)	Information Data Security System	1.00	More than 0.54
	Voice Data Security System	1.00	
	Recording file security System	1.00	
	Online training System	1.00	
	Knowledge management system	1.00	
	Remote IT assist System	1.00	
	Agent performance system	1.00	
	Real-time communication system	1.00	
	Real-time monitoring and barge-in system	1.00	
	Independent work place	1.00	
	Broadband internet connection	1.00	
	Teleconference system	0.85	
	Online test system	0.85	
	WFM System	0.69	
	HR system (HR Data and Payment)	0.69	
	Video conference system	0.08	Lower than 0.54
	Community system	0.08	

Organizational Characteristics (20)	Manager's organizational capability	1.00	More than 0.54
	Manager's communication style	1.00	
	Various offline meeting to feel sense of belonging	1.00	
	External expenditure (Electric tax, internet fee) support	1.00	
	Home office equipment (Desk PC, Headset, chair) support	1.00	
	Timely feedback/communication from manager	1.00	
	Organizational technical support	1.00	
	Independence of home-based team	0.85	
	Social support	0.85	
	Manager's leadership style	0.85	
	Specialized incentive scheme	0.85	
	Manager's technical support	0.69	
	Various working schedule	0.69	
	High attrition rate	0.69	
	Frequent feedback/communication from manager	0.69	
	Helpdesk/IT team for home-based team	0.54	
	Specialized career program	0.54	
	Specialized home-based supervisor training program	0.38	Lower than 0.54
	High ratio of applicants hired	0.23	
	Same training opportunity with office agent	0.08	
Task Characteristics (9)	Clear transfer process set-up beyond my job description	0.85	More than 0.54
	Task simplicity	0.85	
	Task Identity	0.85	
	Narrow scope of task	0.85	
	Call type: Outbound	0.69	
	Frequent recency of task	0.54	
	Call type: Inbound	0.54	

Human Resources

The panelists deemed only 7 of the 16 items on the human resources category significant. Approximately 43% of the human resources questions were considered significant. The highest rated characteristics in Round 3 included sense of responsibility, time management skill, and family and leisure centrality.

Physical Resources

The panelists deemed 15 of the 17 items on the physical resources category significant. Approximately 88% of the physical resources questions were considered significant. The highest rated physical resources characteristics included Data Security Systems, Online training system, Knowledge management system, Remote IT system, Agent performance system, Real-time communication system, and Real-time monitoring & barge-in system. Independent work place with broadband internet connection is essential for the agent.

Organizational characteristics

The panelists deemed 17 of the 20 items on the organizational characteristics significant. 85% of the organizational characteristic questions were considered significant. The highest rated organizational characteristics are manager's organizational capabilities, manager's communication style, offline meetings to encourage the sense of belonging, additional expenditure support, home office equipment support, timely feedback from manager, and technical support.

Task characteristics

The panelists considered all the seven task characteristics and 100% of the task characteristics questions significant. However, the highest rate for task characteristics is only 0.85, which means that not all participants consider these items essential. The highest rated task characteristics included clear transfer process beyond the responsible job, task simplicity, task identity, and narrow scope of task.

4.3. Tentative Conclusions of Delphi study

Home-based model of call centers is in introductory stages in South Korea. Only 12 companies out of 2,000 have adopted the home-based work model. This study finds convergent opinions among home-based call center experts. 46 factors from the four characteristic categories (human resource, physical resource, organizational characteristics, and task characteristics) were identified using the Delphi process.

As only 43% of the human resources questions were identified as significant, we can conclude that the home-based call center experts of South Korea tend to consider the surrounding characteristics, such as organizational, task, and physical resources, more important than the human resources related characteristics of the agent. Bailey & Kurland [42] argue that the employee motivations for teleworking are unclear. Commute reduction and family

obligations, which are commonly perceived as primary reasons for choosing home-based work and motivators for home-based workers, did not appear critical. From Bailey & Kurland's point of view, we can assume that the characteristics of home-based agents are unclear and so we observe low convergence in the opinion of experts.

Almost all the factors in the previous studies are in line and supported by the findings of this study. However, we cannot draw a final conclusion only on the basis of this Delphi study. Rather, as a next step we need to verify the Delphi results using multiple regression analysis to identify the factors that really drive the success of home-based call centers.

- * The present study only includes the results of the first step of the identification of critical success factors for the home-based call centers. The surveys for the second step of verification of the Delphi results are currently in progress

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