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Title(English)	A Translational Approach to Value Co-creation and Innovation of Healthcare Services
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Citation(English)	Degree:, Conferring organization: Tokyo Institute of Technology, Report number: 9911 , Conferred date:2015/3/26, Degree Type:Course doctor, Examiner:,,,,
( )	
Type(English)	Doctoral Thesis

A Translational Approach to Value Co-creation and Innovation of

Health Care Services

Ph.D. dissertation

February 2015

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A thesis submitted in partial fulfillment of the requirements
For the Ph.D. degree in the Department of Value and Decision Science,
Graduate School of Decision Science and Technology,
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THESIS SUMMARY

This research sets out to clarify the *translational* features of value co-creation of health services at a transitional environment by analyzing the processes of human activity systems through which knowledge is generated and transferred. By interacting with various agents and intervening in context with them, an agent attempts to translate such human factor as competencies into value. Once the value is perceived by a customer in a certain context, then it turns into value-in-context regardless a customer encounters services or physical artifact/goods. Context is never static but dynamic elements are innate in it since context is constantly evolving in human activity systems in relations with knowledge. This study, through a mix of quantitative/empirical, qualitative/conceptual, case-based/exploratory, and archival-based/ descriptive methods, showed the followings: (1) the human competencies including interpersonal understanding and relationship building are salient as well as technical expertise particularly in addressing the behavior for value co-creation, where human competencies are relationship-focused while technical expertise are agent-focused. (2) high performers exhibit dynamic actions and contextual transformation such as participation (*contextualization*), interpretation (*re-contextualization*), socialization (*co-contextualization*), objectification (*de-contextualization*) and translation (*trans-contextualization*), (3) the policy-centric and product-centric translational cycles characterize the dissemination of service technology of pressure ulcer therapy.

This dissertation empirically clarifies the translational features of value co-creation and innovation of healthcare services in light of *ba* or shared context-in-motion by examining theoretical frameworks and proposing models primarily based on the approaches of service systems sciences. The major contribution to science, if any, could be summarized into three focal points. First, this work empirically models the dynamic interaction between agents' competencies and dynamic contexts in micro shared context-in-motion typically found in workplace and community of practices. Second, the translational characteristics of innovation processes of healthcare services are identified at macro shared context-in-motion or international industry-hospital-academic-government relations by observing historical diffusions of knowledge and contextualization associated with innovation processes. Third, the general model on translation of knowledge and contextualization is proposed that bridges between micro, mezo and macro phases of shared context-in-motion in addressing value co-creation and innovation of services. Those three points, when used as lenses, shed light on the issues that have not been effectively and efficiently discussed by the conventional approaches usually employed by health services administration or systems approach in healthcare. Greater clarity of translational aspects of value co-creation in health services, discussed herewith in this dissertation, will assist those engaged in service innovation and services systems management in both scientific disciplines and practical fields.

ACKNOWLEDGEMENTS

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Chapter 1: Introduction

The purpose of this thesis project is to investigate the translational features of value co-creation of healthcare services. To begin with, this chapter describes the problems and significance of the issues upon which this thesis is built. Then a meta research question and the subsequent research questions underlying this thesis will be raised. Following those parts the alignment of the structure of this thesis project will be presented.

1.1 Statement of problems

Humankind has been trying to increase their population by balancing the relation between survival of piece and survival of individual. The human race has survived anyhow by resolving environmental constraints by utilizing the reproductive function in terms of the population (15 years - 50 years old) and by innovating social technology systems. The social technology systems have largely evolved from agriculture through manufacturing to services. The carrying capacity of population is a result of dynamic interaction between the environmental constraints and the societal systems. The equilibrium of such dynamic interactions has resulted in survival capability and carrying capacity of population. Due to the declining birthrate and a growing proportion of the elderly, however, the working population is estimated to decrease. In such circumstances it is necessary for community and healthcare systems to care its population more effectively and efficiently than ever before with less working population in health services.

As such, regardless of whether they are developed or emerging, health services management has been challenged in many nations and regions, in terms of equity, access, quality, cost-effectiveness and human resources development. As a result the necessity of changes has been emphasized by numerous policy makers, practitioners, professionals and firms in healthcare industry. In recent years through a discipline of healthcare management and technology management, innovation in healthcare has been frequently discussed and portrayed as the introduction and diffusion of novel physical artifacts such as medical devices and pharmaceuticals for improving level of healthcare in general and patient care in particular (Consoli and Mina 2009, Djellal and Gallouj 2005). The general features of health innovation processes (Gelijins and Rosenberg 1994, Gelijins et al. 2001), where the type of integration and the contribution of each component play a salient role (Metcalfe et al. 2005) have attracted attention for a deeper level of analysis.

The patent data associated with the development of novel physical artifacts have been effectively analyzed to grasp the collaborative process between industry and physicians (Chatterji et al 2008). Also the process of medical product innovation was empirically researched (Mitchell 1991b), of which findings were closely linked and supported by the literature that considers importance of "lead user" (Von Hippel 2005, von Hippel 1988). On the other hand, the recent study in service

innovation in the healthcare sector (Djellal and Gallouji 2005, Gallouji and Windrum 2009) emphasized a broader, dynamic and systemic approach to grasp the innovation in healthcare. The current study (Galbrun 2010) regarded that medical innovation, beyond sole product development, was a practice variation to heal patients by improving services including and treatments procedures facing the variability of patients and diseases, combined with technological change. Thus the current studies in health management have tended to pay more attention to such subjects as "cure" rather than "care", physical artifact rather than non-physical artifact or healthcare services, and the interactive behavior of physicians and firms rather than those of diversified care givers in complex contexts.

1.2 Research purpose and questions

The primary purpose of this thesis is to study *translational* features of value co-creation at healthcare institutions through a combination of quantitative/empirical, qualitative/conceptual, case-based/exploratory, and archival-based/ descriptive approaches, and based on those, to propose models of translational service activities for value co-creation. To achieve the aforesaid purpose, we focus on value-in-context, service systems, human activity systems, human resources management systems and human competency. As such the research questions are raised as follows:

- Meta RQ: What factor characterizes the features of translational value co-creation in health services, and how?

In order to answer the above, we have broken down our research questions as follows:

Chapter 3:

- RQ1: What are the top six competencies that target population expects a high performing staff nurse, managerial nurse and trainer nurse to have?

- RQ2: What are the top six competencies that the target population expects a high performing nurse to have to correspond to new technology and innovation?

Chapter 4:

- RQ 3: What human factors differentiate quality and value of nursing services?

- RQ 4: How does a high performing individual intervene in organizational contexts and co-create value?

- RQ 5: What kind of competency does a high performing nurse exhibit?

Chapter 5:

- RQ 6: What are some of the appropriate ways to intervene in the process of human activity modeling?

- RQ 7: How does a service system transfer and diffuse across the system boundaries?

Chapter 6:

- RQ 8: How does service innovation emerge in healthcare services?

- RQ 9: What are some of the appropriate ways to install human activity system as a viable system?

Chapter 7:

- RQ 10: How has the risk assessment tool for pressure ulcer diffused internationally?

- RQ 11: What are some of the key elements that enabled the diffusion in Japan?

1.3 Structure of the thesis

This section is concerned with the structure of this thesis project. As is shown below in Figure 1-1, this thesis consists of the nine chapters. To begin with Chapter 1 provides an overall introduction of this work in which major problems, research purpose and research questions are described. Then we will portray our hypothetical view of translational approach to value co-creation in order to set the base for the chapters that follow. Based on such notion the research structure composed by this study will be addressed.
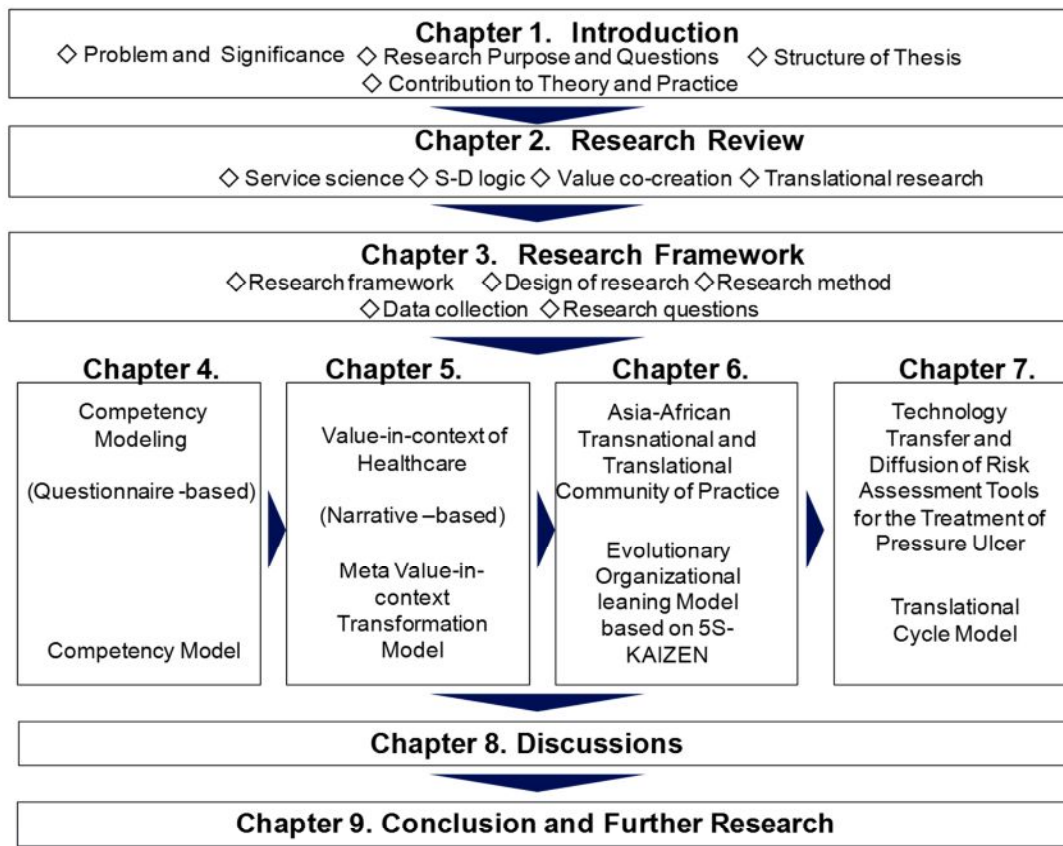
Figure 1-1: Structure of the Thesis

Chapter 2 focuses on reviewing the relevant literatures to carry out the research project. Upon reviewing such literatures concerning with this work, the research framework to organize this study will be presented.

Chapter 3 proposes the research framework of this thesis. The methodological details will be addressed to such issues as research strategy, research design, research method, data collection and research structure.

As a quantitative and empirical study Chapter 4 starts with a trial to capture quantitatively the "should be" perception as to "high performing nurse" in the mindset of employed nurses. A set of questionnaire to quantitatively grasp the required competencies of a "high performing nurse" was developed and implemented. This data provide some aspect of internal model on the part of the nurses employed by one of the cutting-edge university hospital (hereinafter referred to as the XYZ Hospital) with us. Then we accommodated various perceptions and opinions by having feedback sessions in order to design and share the competency model. Consequently this chapter describes the key processes through which an institution is able to bridge recursively the practical aspect of human resources management and theoretical perspective of service systems development.

In Chapter 5, value-in-context of health care is investigated both qualitatively and conceptually by utilizing the competency approach based on our original data obtained at the XYZ hospital. After conducting behavioral event interviews and text coding, the key human competency and behavioral characteristics of outstanding nurses were identified. The results, together with the data obtained by the aforesaid questionnaires, were shared and construed by involving the concerned members in a world cafe session at our client site. After sharing epistemological analysis on the obtained text data, a model namely "Meta value-in-context Translational Model" is presented as an output of this chapter.

Chapter 6 uses case study in explorative manner where we descriptively analyzed the cases of Asia-African transnational and translational community of practice of continuous quality improvement named "the 5S-KAIZEN-TQM" from the perspectives of value co-creation as well as systemicity. Discussion will be given by such dimensions as holism and hierarchy, communication, control, and evolution.

Chapter 7, grounded on archival analysis, discusses descriptively translational and technological features of service systems by focusing on an international technological trajectory of evolutionary changes of a decision support system at modern clinical settings. Thus this chapter is a trial to describe innovation process of a service system by selectively tracking risk management tool for pressure ulcer. We are interested in capturing how a service system can be developed, designed and defused internationally.

By weaving aforesaid findings and implications into further argument, Chapter 8 is devoted for discussions on translational approach to value co-creation of healthcare services. Chapter 9 concludes this thesis. It also explores future direction of the related study partly by reviewing the shortcomings of this research.

Chapter 2: Review of previous studies

This chapter reviews the relevant literatures upon which this dissertation is built. The literatures about competency, human activity system, service human resources management system, quality, narrative, and internal model will be reviewed in the separate section to construct an analytical framework for this dissertation. Therefore this section reviews relevant literatures from a wider perspective that involve service science, value co-creation, and service-dominant logic, translational research and translational systems sciences which also provide perspectives to this work.

2.1 Service science

Over the past decades, by replacing the predecessors including agriculture and manufacturing industries, the service sector has grown substantially to become dominate socio-economic activities at least in terms of gross domestic product in most of the advanced economies. Service science is emerging partly running parallel with this phenomenon and partly observing the delay in theorizing the diversifying practices in services.

According to University of Cambridge Institute for Manufacturing (IfM) and International Business Machine, Service science, an umbrella term for emerging discipline or Service Science, Management and Engineering, named as a symbol of rigor in pursuing the truth. It is the integration of many service research areas and service disciplines, such as service economics, service marketing, service operations, service management, service quality (especially customer satisfaction), service strategy, service engineering, service human resource management (especially in a professional service firm), service computing, service supply chain (especially eSourcing), service design, service productivity, and service measurement (IfM and IBM 2008) .

Service science is a field of study of value co-creation interactions among entities through a lens of service systems thinking, where service is often defined as the application of competencies (skill and knowledge) for the benefit of another (Spohrer et al. 2008). It asserts the importance of integration of disciplines across academic silos (Chesbrough and Spohere 2006) which tend to be fragmented these days. Service science combines organizational and human understanding with business and technological understanding to categorize and explain the many types of services that exist as well as how service systems interact and evolve to co-create value (Maglio and Spohrer 2008). Service systems are value co-creation configurations of people, technology, value propositions connecting internal and external service systems, and shared information - language, laws, measures, and methods - (Maglio and Spohere 2008). This view is consistent and shared by such scholars as Lush, Vargo and Wessel and the researchers at IfM. Lush and Vargo also argued that service systems involve economic exchange and service is the fundamental purpose of economic exchange (Lush and Vargo 2008; Wladawsky 2006). On the other hand there was an argument focusing on complexity of

services. Service systems are complex due to the sheer amount of connections and interactions taking place (Maglio et al. 2006). Some researchers regarded that service systems could be an autopoietic system, and assert that service system behavior is difficult to explain and predict due to the complex and dynamic interactions between resources (IfM and IBM 2008).

2.2 Service-dominant logic

Service quality, as viewed from a marketing perspective, has been one of the central research topics for many researches from 1980s. Amongst those the features of customer-provider interactions have attracted interests in addressing quality of services. The 'Gaps model of service quality' is a well-known conceptual framework to comprehend and address what service quality is all about. Prasuraman et al. (1985) proposed that service quality was a function of the differences between expectation and performance. SERVQUAL (Service Quality) scale was proposed by Parasuraman et al. (1988) for measuring the aforesaid gaps. Parasuraman et al. (1985) mentioned ten factors for evaluating service quality including; tangibility, reliability, responsiveness, courtesy, credibility, security, accessibility, communication and understanding customer. Parasuraman, Berry and Zeithamal (1991) defined service quality as 'the extent of discrepancy between customer's expectations or desires and their perception.' Asubonteng et al. (1996) asserted that service quality could be defined as 'the difference between customer's expectation for service performance prior to the service encounter and their perception of the service received'.

Currently subjectivity rather than objectivity on the part of recipient as well as of provider has been taken into account in addressing service quality. According to Gronroos (2002), service quality is the subjective comparison that customers make between the quality of service that they want to receive and what they actually get. Service-dominant logic (hereinafter referred as S-D logic) has emerged as a comprehensive logical framework in approaching any services. As a discourse, S-D logic is no more than a re-statement of ideas in such disciplines as social sciences and marketing in particular. However, Vargo and Lusch's unique contribution to service studies marketing theory is in re-framing these ideas in a new holistic perspective (Lusch and Vargo 2006). Also their contribution so far has been widely accepted in service studies that such international conference as the Naples Forum on Service (2009, 2011, and 2013) has put emphasis on S-D logic as one of the pillars including network & systems theory and service science. They made foundational premises and explanations as follows (Lusch and Vargo 2006):

FP1: Service is the fundamental basis of exchange.

The application of operant resources (knowledge and skills), "service," as defined in S-D logic, is the basis for all exchange. Service is exchanged for service.

FP2: Indirect exchange masks the fundamental basis of exchange. Because service is provided through complex combinations of goods, money, and institutions, the service basis of exchange is not always apparent.

FP3: Goods are a distribution mechanism for service provision. Goods (both durable and non-durable) derive their value through use - the service they provide.

FP4: Operant resources are the fundamental source of competitive advantage. The comparative ability to cause desired change drives competition.

FP5: All economies are service economies. Service (singular) is only now becoming more apparent with increased specialization and outsourcing.

FP6: The customer is always a co-creator of value. Implies value creation is interactional.

FP7: The enterprise cannot deliver value, but only offer value propositions. Enterprises can offer their applied resources for value creation and collaboratively (interactively) create value following acceptance of value propositions, but cannot create and/or deliver value independently.

FP8: A service-centered view is inherently customer oriented and relational. Because service is defined in terms of customer-determined benefit and co-created it is inherently customer oriented and relational.

FP9: All social and economic actors are resource integrators. Implies the context of value creation is networks of networks (resource integrators).

FP10: Value is always uniquely and phenomenologically determined by the beneficiary. Value is idiosyncratic, experiential, contextual, and meaning laden.

2.3 Value co-creation

When it comes to value, "Whereof we cannot speak, thereof we must remain silent" (Wittgenstein 1922) is not the case, since many people speak about "value" despite it is difficult to define it. The adjective to "value" could be a priori, at the same time, a posteriori. In his labor theory of value, Karl Marx, based on Adam Smith's discourse, wrote the value of an object depended only on how much labor went into its production. Thus he did not find value in capital or consumption. According to Smith, value "in use" means the usefulness of commodity or its utility, and value "in exchange" means the relative proportion with which the commodity exchanges for another commodity. On the other hand the current literatures in related disciplines imply that the term "value", due to its abstract, equivocal, versatile, complex and multi-faceted feature, continues to eschew a single solid definition.

Consequently there are a number of ways to define "value" from various points of view. For example, symbolic meaning (Shankar 2009) ; interactive relativistic preference experience (Holbrook 1994) ; value-in-use (Vargo and Lucsh 2004); value-oriented services marketing (Bruhn 2006) ; brand value by using design (Mozota 2003) to refer just a few.

Nowadays such words with prefix "co" as co-creation, co-production and co-design have been frequently used, however, these "co-concepts" are confusing in both the theoretical and practical discussions. The word of "co-creation" was first introduced with clear-cut original concept (Prahalad 2000; Ramaswamy 2004). They defined co-creation as "joint creation of value by the company and the customer which allows customers to co-construct the service experience to their own context". In the past decade, however, the discussion utilizing "co-concepts" including co-design, co-production and co-creation and so forth have been booming while lacking a consensus of definition. By using text mining, Koskela (2013) researched the papers of such fields as computer science, engineering, business, social sciences, decision sciences, psychology, economics, health professions and multidisciplinary studies published between 2000 and 2012, over 4000 papers. He found that there have been usages of such words as co-design (2707 times), co-creation (878 times) and co-production (737times), which highlights the vast use of these concepts in the academic literature (Koskela-Huotari et al 2013). Thus "co-concept" has tended to lack a consistent and solid theoretical background in spite of the vast referral.

Among others this thesis project pays attention on the conceptual framework for understanding the dynamics of service innovation as illustrated in Figure 1.1 (Gulbrun and Kijima, 2009). According to this model four concepts are introduced as follows:

- Co-experience and shared internal model which results in co-definition,

- Co-development (relation focused) and co-elevation (entity focused) (Galbrun, 2010).

Although many models explaining innovation are at our hands, this model generally explains an essential part of service innovation process.
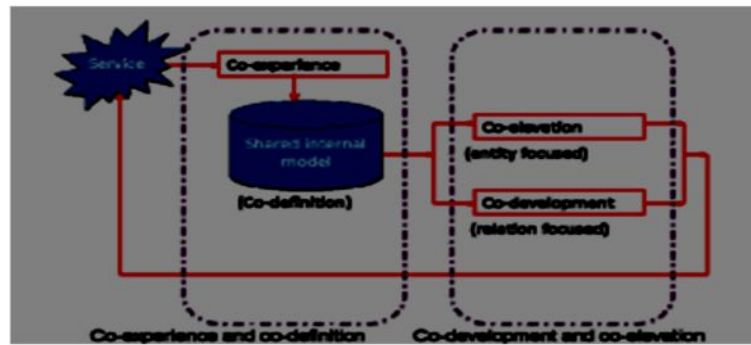
Figure 2-1: Service Innovation Model

This model is to do with "general systems theory" (Bertalanffy 1968) in that a set of two constituencies are assumed to constitute a system, that is entity (actor) and relation. Entities and relation among them, in other words, entities nested on relationship form a coherent whole. The interaction amongst agents to improve entity is co-elevation, whereas interaction amongst agents to improve relation is co-development.

In service context actors are complex and adaptive with the ability to learn, develop and apply their competencies over time. Generally actors (including provider and customer) experience service at a certain context together (co-experience) and share a certain internal model. The process involving co-experience and shared internal model leads to co-definition. For instance by having co-definition process in common, healthcare team members (actors) such as physician, nurse, medical technologist, bio scientist and so forth are able to share internal model where the concerned agents are interactively learn each other, and at the same time experiences are mutually defined and shared as an internal model. An internal model hatches innovation of health services. Consequently dissemination of a particular intervention method is realized through co-definition. Then another co-elevation (entity focused) and/or co-development (relation focused) are added, which result in continuously improved service.

2.4 Co-evolution

Another catchy word with a prefix "co-" would be co-evolution. The concept of co-evolution, however, was originally developed in biological sciences. In biology, co-evolution means the change of a biological object triggered by the change of a related object (Yip et al. 2008). According to a co-evolution model, "for an evolutionary system, continuing development is needed just in order to maintain its fitness relative to the systems it is co-evolving with" (Van Valen 1973). Co-evolution is originally a biological concept, but has been applied by analogy to other fields of studies such as

computer science, sociology and technology management. Thus the literatures on co-evolution in social sciences began to appear frequently in 1990s urged by insightful researches on the relations between economy and innovation (March 1994, Nelson 1995, Barnett and Hansen 1996).

Why is the analogy effective in addressing innovation? First co-evolution fits the dynamics of agents including organizations, customers and competitors in an environment. Second, this concept fit well with complex interactions amongst numerous entities or agents that have will to survive. Third, adaptation and selection analogy embedded in co-creation flamboyantly explain, for instance, product life cycle and corporate life cycle in a competitive environment. Forth, an analogy of cross-fertilization amongst entities is found useful, for example, in addressing phenomena involving firm and firm (competition, alliance, merger and acquisition), firm and university (industrial academia cooperation or industrial academia complex in an old term), firm and customer (B to C marketing, user-led innovation), domestic firm and overseers company (international competition and cooperation), and people, firm, industry, government (national innovation system) and so forth.

2.5 Translational research and translational systems sciences

The concept of translational research, an alternative to the traditional dichotomy of basic research and applied research, was originated and applied in medicine. The term 'translational medicine' was traced back to 1966, when the idea of "from bench to bedside" was presented in Bioscience (Mckinney et al 1966). The process of translating basic scientific discoveries into clinical applications, and ultimately into public health improvements, has emerged as a salient, but complex objective in biomedical research. The process can be described as a "translation continuum," since various resources, actions, and processes are involved in this progression of knowledge, which advances discoveries from the "bench to the bedside" (Woolf 1974).

The management of translation continuum is not at all an easy task. The complete translation continuum is a complex process and takes an average of 17 years for research evidence to reach clinical practice (Westfall et al 2008). These days translational research is expected as an effective solution to resolve the disparity between the ever increasing investment in R&D at research institutions and comparatively limited realized impact growing at a much more modest rate at bed side. As such translational research has become an issue of increasing importance to scientists, healthcare professionals, research institutions, pharmaceutical firms and governments around the world.

In the discourses on translational research there has been an underlying implicit expectation or even value judgment that scientific discoveries, by and large, should be *translated* into practical applications to improve human health effectively and efficiently. A typical translational research refers to at least two distinct domains: *T1 research*, the "bench-to-bedside" enterprise of translating knowledge from the basic sciences into the development of new treatments; and *T2 research*, translating the findings from clinical trials into everyday practice (Woolf 2008). Such discoveries

typically emerge at "the bench" with basic research where scientists study disease and then progress to the clinical level or the patients' "bedside." The bench-to-bedside approach to translational research is a two-way communication and knowledge flow in the translation continuum. In bench-to-bedside, scientists provide practitioners with new tools for practical use in patients and for assessment of their impact. In bedside-to-bench, on the other hand, clinical practitioners make novel observations about the disease that often stimulate further scientific research and exploration. Currently as oppose to T1 and T2, the T3 research defined as from clinical science to health improvements was proposed to explain the modern translational research (Westfall 2007). Translational research fosters the multidirectional integration of basic research, patient-oriented research, and population-based research, with the long-term aim of improving the health of the public.

Nowadays a more comprehensive T1-T4 model has been proposed (Zerhouni 2005) According to Zerhouni (2005), As indicated in Figure 1-2, T1 or translational phase 1 begins the translation journey from bench to bedside to community. During this phase, researchers are expected to conduct preclinical studies and phase 1 and 2 clinical trials. Then T2 expands discovery to larger patient populations in phase 3 and 4 clinical trials, observational studies, and even some survey research. T3 launches the practice-oriented stage of translational research by implementing it to find out if a certain treatment or practice works in a real-world setting. Lastly T4 focuses on health policy and management. If T1-T3 were successful, the next step is to find the best method of reaching clinicians and patients with a nationwide policy concerning targeted treatment or strategy.
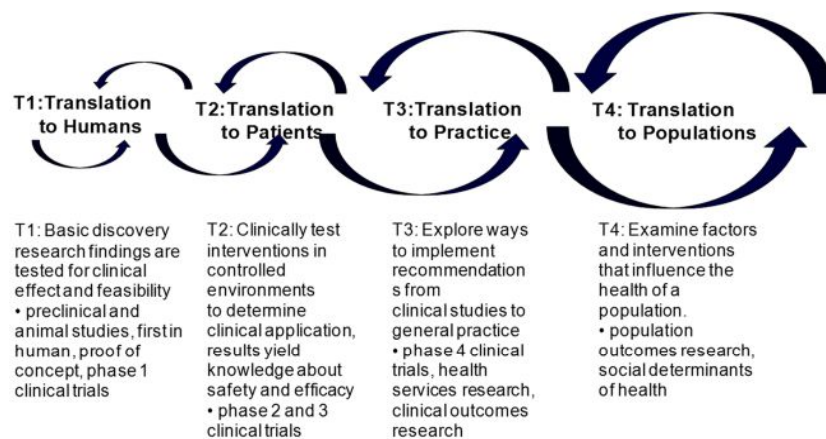
Figure 2-2: Goals and tasks of translational research

The very fact that translational researches are evolving rapidly makes it rather difficult to define translational research *per se*, however, National Institute of Health (2013) defines; "Translational research transforms scientific discoveries arising from laboratory, clinical, or

population studies into clinical applications to reduce cancer incidence, morbidity, and mortality."[1] In medicine, translational research has been even recognized as a separate specialized research field; for example in 2009 the American Journal of Translational Research was first published.

The disciplinary boundary of medicine is becoming blurred and obscure these days. The fact remains, at least as of today, that emerging technologies are melting the boundaries of the medical sciences, regardless of whether they are basic, clinical or practical. Emerging technologies and scientific disciplines can influence, and be influenced by, the various agents, methodologies and methods involved in translational research significantly. Examples of currently emerging technologies include information technology, nanotechnology, biotechnology, cognitive science, robotics, and artificial intelligence. Among those NBIC, an acronym for Nanotechnology, Biotechnology, Information technology and Cognitive science (Roco et al 2004), is currently one of the most popular terms for describing emerging and converging technologies.

The 'translational' idea has had impact not only on emerging disciplines but also on frontiers of other systems disciplines such as systems sciences. Partly running parallel with evolving new thinking of systems sciences and partly observing the movement of translational research, translational systems science (Kijima et al. 2013) was proposed. According to Kijima (2013) translational systems science aims at cultivating a new frontier of systems sciences for contributing to the need for practical applications that benefit people by particularly paying attention to three set of values. Those include, (1) values relevant to social infrastructure such as safety, security, and amenity; (2) values created by innovation in business, economics, and management practices; and, (3) values necessary for community sustainability brought about by conflict resolution and consensus building (Kijima et al. 2013).

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[1] The home page of The Translational Research Working Group
http://www.cancer.gov/researchandfunding/trwg/TRWG-definition-and-TR-continuum

Chapter 3: Research Framework

This chapter presents the research framework. This chapter firstly describes the research strategy and framework. Secondly it addresses the methods we design our researches in the four formats, i.e., 1) quantitative and empirical approach (Chapter 4), qualitative and conceptual approach (Chapter 5), explorative case method approach (Chapter 6), and archival and descriptive approach (Chapter 7) in order to attain the research goal. Thirdly an analytical framework will be presented in which key concepts such as competency, human activity system, human resource management system, value and quality, narrative and internal model will be critically examined to construct the analytical framework.

3.1 Research strategy

In this work we intended to explore translational features of value co-creation of health services in the two perspectives. The first perspective focused on the micro aspect of translational phenomenon of value co-creation of health services where the key words include context of workplace, individual agent, the behavior of high performer, competency, and human resources development system. In order to investigate such issues as value-in-context of health services and competency modeling, we established a joint research project with XYZ University Hospital. The project had been financially supported by the Ministry of Education, Culture, Sports, Science and Technology. In this project our engagement focused on (1) finding human competencies of high performing nurses, (2) finding behavioral characteristics or latent patterns of high performer, and (3) integrating those findings into designing the new human resources development systems. We had abundant opportunities to access qualitative and quantitative data encompassing 1400 nurses on clinical settings and utilize those data to design and develop the required systems in action based learning format to bridge practical and theoretical elements. Value-in-context of healthcare (Chapter 5) and Competency modeling (Chapter 4) describe the processes and results of such research.

The second perspective particularly focused on the macro aspect of translational phenomenon of value co-creation in health service. Translational elements were examined through such lenses as international and intercultural diffusion, macro context of technology trajectory, emergence of service quality improvement, and organizational learning. The issues covered included; the Asia-African transnational and translational community of practice in value co-creation of health services (Chapter 6). Chapter 6 covers technology transfer and diffusion of risk assessment tools for the treatment of pressure ulcer. This chapter approaches the thesis by conceptualizing (1) international technological transfer with incremental improvements, (2) policy-interventional translational research cycle embedded in the academia-government-hospital complex, and (3) product-centric translational research cycle embedded in the industry-academia-hospital complex.

In addressing translational features in value co-creation in services, we have assumed that action research (Checkland 1981, 1999; Jackson 2003) approach is significant as a participatory observation method. Especially in our work in Chapter 4, 5, and 6, the position of authors was researcher in action research program rather than pure observers; that is, we intervened in the XYX Hospital by applying our theory, hypothesis, model (idea) to the practice at the clinical settings, and learn from the practices (experience) at the field of our client organization. On the other hand, an isomorphic small circle of interaction between theory and practice cycled on recursively at the field level. Consequently we positioned ourselves as the interveners into the dual cycles between theory (idea) and practice (experience). As shown in Figure 3.1, in approaching translational features of value co-creation in healthcare services, we have assumed that a domain shift caused by action research is essential in realizing new combination of entity and relation.
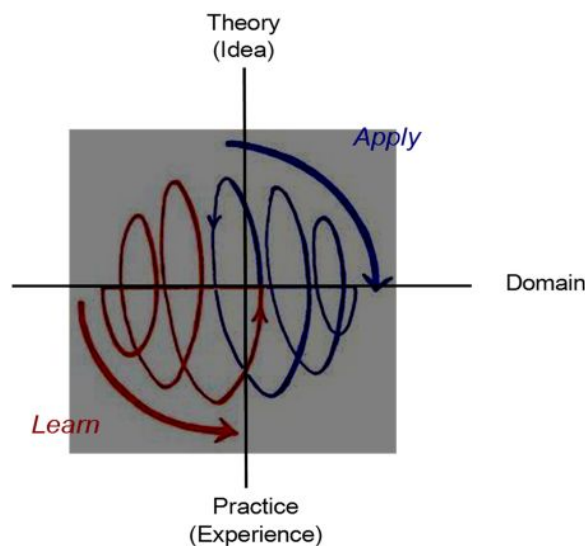
Figure 3-1: Domain Shift

3.2 Design of research

The design of our research was two-fold. The first one was concerned with the design of each study. The independent but closely related four studies constituted this thesis in an attempt to address translational features of value co-creation of healthcare services. The work included in Chapter 4 was based on quantitative and empirical study using a hypothesis test method. Chapter 5 used a qualitative and conceptual approach by combining narrative inquiry and text coding. In Chapter 6 a case study was employed to address the translational activity of quality improvement, namely the 5S-KAIZEN method-TQM. Chapter 7 utilized an archival research on the titles of academic papers by focusing on treatment of pressure ulcer. The details of each research design will be addressed in the latter parts.

The second one was all about the ground design concerning with the utilization of findings at our client institution or XYZ hospital. In other words it directly relates with designing 'our services' to be created throughout the contract-based project processes with client institution. As such, as has been discussed above, the grand design encompassing the whole study was based on participatory action research; the data and findings were feedback and accommodated to and within our client hospital through variety of occasions to enhance communication, share recognition, revise our understanding and check our hypothesis. That means, when addressing our unique position in this project, what we as researchers delivered or wrote is inherently a self-referential discourse. Therefore it should be noted that research feature of the first half and of the last half ought to be discerned and treated separately to avoid risks involved by self-referential contradiction.

3.3 Action research

The research was designed in accordance with above mentioned research strategy. Particularly the research in Chapter 4 and 5 are the description and output of the action research program to align human resources development system based on competency model. Note that the outcome and major findings were feedback to the target people at the client institution to share, deepen and construe those results.

The management of XYZ Hospital appointed us as an external consultant to help them resolve their problems. Based on their needs we, as a facilitator and consultant applied our expertise to deliver solutions to the board members/administrators of the hospital. We became a participant in the action at our client where the process of change was a salient subject for this project.

The deliverables included, but not limited to, visualization of ill-structured problems, knowledge about competency theory, its application, competency questionnaire, behavioral event interview, text coding, competency modeling, various sorts of workshops and world cafe to carry on the project. Thus virtuous circle of interaction between ideas and experience (Jackson 2003) was designed and embedded in our action research project as shown in Figure 3-2.
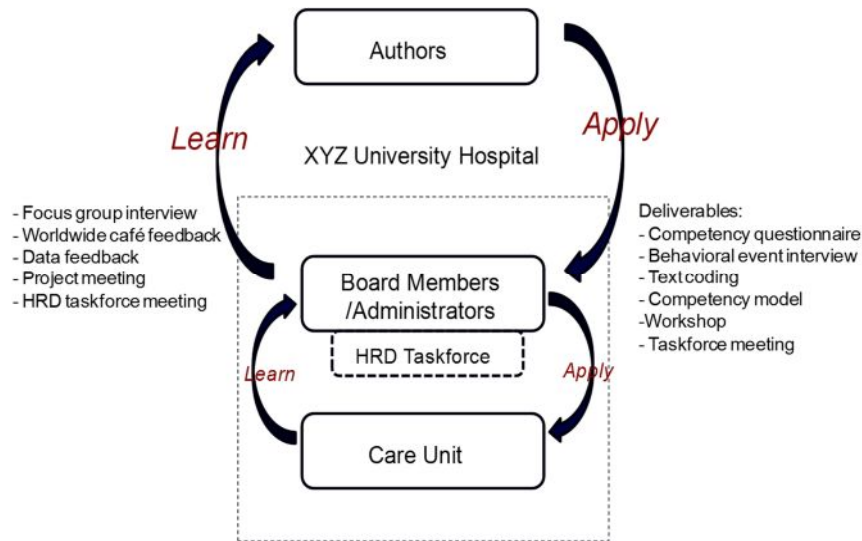
Figure 3-2: Design of research

At the client hospital the equivalent circle of action research program was introduced to progress the project. The human resources development committee was organized that was responsible for carrying out the action research program.

3.4 Study method and data collection

The aforesaid research questions founded the basis of the study method and data collection plan. As such we aligned the mixed methods of research and data collection plan within a framework of action research as follows:

Chapter and Theme	Typology	Object	Method
Chapter 4: Value Co-creation of Health Care Services through Competency Modeling	Quantitative/ Empirical	Nurses employed by XYZ University Hospital (N=1235)	- Hypothesis testing
Chapter 5: What Human Factors Differentiate Value of Nursing Services?	Qualitative/ Conceptual	Top 23 nurses out of 1235 nurses employed by XYZ Hospital	-Behavioral event interview and narrative — Text coding - Discourse analysis
Chapter 6: Asia-African Transnational and Translational Community of Practice in Value Co-creation of Health Services	Case study/ Exploratory	Cases including hospitals in Asia and African countries	-Participatory observation
Chapter 7: Innovation in Health Service Technology Transfer and Diffusion of Risk Assessment Tools for the Treatment of Pressure Ulcer	Archival Study/ Descriptive	2913 academic papers and articles published from 1960 to 2010	- Archival analysis - Field survey

As of December 2013

Figure 3-3: Data Collection Method

The study in Chapter 4 was structured to empirically test the hypothesis about the perception of required competencies in the part of the nurses. The quantitative numerical data set was collected by conducting a questionnaire-based research to the targeted object, i.e., the 1435 nurses employed by XYX Hospital in order to test our hypothesis. The goal was to find the perceived degree of priority as "an ideal nurses" among twenty competency items as independent variables in the population in order to test the hypothesis.

The work in Chapter 5 was based on qualitative and conceptual method. Here we used the combination of narrative inquiry and text coding on the acquired text data (Appendix C). While the data obtained in the previous work was geared toward to the "should be" perception as to "an ideal nurse" in the mindset of employed nurses, the data in this chapter revealed the acted-out competencies of real existing outstanding nurses (or the nurses recognized by the human resources development committee as caliber in terms of quality of care and innovative behavior) at XYZ Hospital.

The content of Chapter 6 was based on descriptive/exploratory analysis where the author performed participatory observation for the action research program of the 5S-KAIZEN method-TQM in Asian African countries including Sri Lanka, Democratic Republic of the Congo.

The study covered by Chapter 7 used an archival analysis. We regarded that the title of academic paper represented an essential discourse of scientific interest and assertion of authors in order to assess the historical changes of targeted themes of research focusing on treatment of pressure ulcer. As such we collected data through word analysis of the title sentences of the related 2,913 academic papers published from 1960 to 2010. Then we conducted the field interview to verify our findings. The goal was to find the trajectory of risk assessment tool of pressure ulcer by tracking the reference relationship amongst the targeted academic paper and field survey.

Topic of each chapter, typology, data target and corresponding data collection method are summarized in Table 2-1 while the details will be addressed in each of the chapters that follow.

3.5 Time schedule

It was necessary to put together the diversified tasks and engagements of the project to a manageable structure. As such, in order to carry out the research project appropriately we allocated and designed each of the tasks and engagements in the time series. Consequently the research project constituted the four parts (corresponding each of the four chapters), and were executed duly in accordance with the time schedule of the research (Figure 3-4).
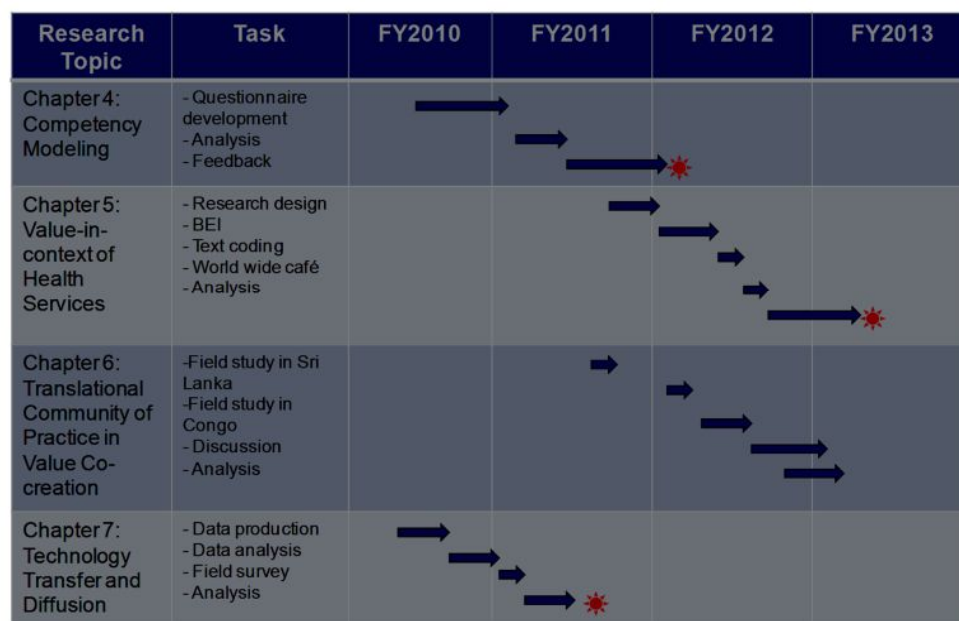
Figure 3-4: Time Schedule of Research

3.6 Analytical framework

After completing all the aforesaid studies, we hypothetically constructed a hierarchical framework as an analytical framework as illustrated in Figure 3-5. Given that service is the application of specialized competencies through the deeds, processes, and performance for the benefit of another entity or the entity itself (Vargo and Lusch, 2004), we provisionally assumed that competency was a key element of human side to address service itself.

We regard that service system is morphologically a form of human activity systems (Checkland 1981) through which human competencies are translated into value-in-context in interaction with various actors including a patient. Between human competency (bottom) and value and quality of services (top), we assume such layers as human resources management system, human activity system and service systems as below. Among other human activity systems, we remark human resources management systems since these systems behave, or at least are assumed, to relate themselves to both human system and human activity system. At a given revel, limits come from the level below and constraints from the level above in biological and social systems (Allen and Starr 1982) and a system is a sub-system of other systems and a system has sub-systems within it. Value for customer is created or perceived throughout the relationship by the customer, partly in interactions between customer and the supplier or service provider (Gronroos 2007). Consequently value-in-context is subjectively, implicitly and phenomenologically co-created with a customer who represents multiple and heterogeneous actors.
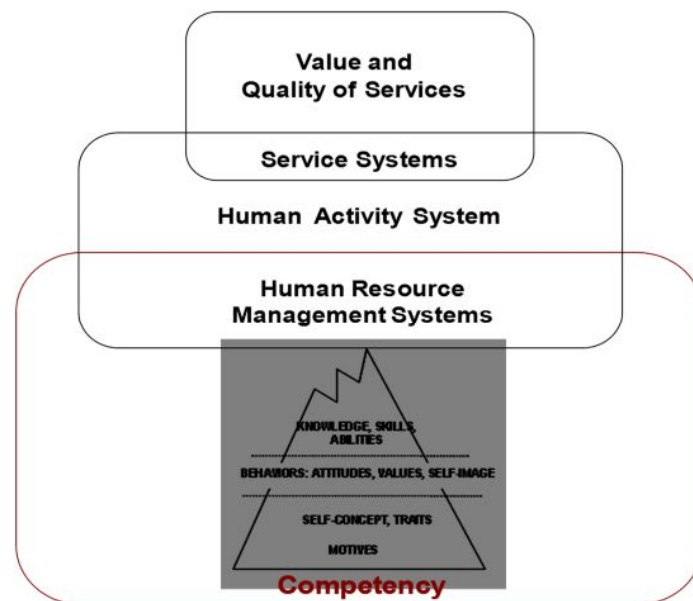
Figure 3-5: Analytical Framework

In constructing the analytical frame (Figure 3-5) we should be careful in framing such concepts as competency, human activity system, service human resources management system, value, quality, narrative and internal model. As such we found it necessary to reframe those conceptual terms by reviewing the literatures in related disciplines.

3.6.1 Competency

The study of competency was first conducted in psychology in the 1970s (McClelland, 1973). A definition that many researchers used was that competencies are underlying characteristics of people and indicate "ways of behaving or thinking, generalizing across situations, and enduring for a reasonably long period of time" (Guion, 1991).

On the other hand, competency has attracted attention in the field of Service Science Management Engineering and Design (Service Science), an emerging area of study with pioneering research work in the areas of service marketing, service operations, service management, service engineering, service economics, service computing, and other service functions (Chesbrough and Spohrer, 2006; Maglio and Spohrer, 2008). In these areas, many researchers have focused on the human aspect of services. According to Vargo et al., service is "the application of specialized competencies (knowledge and skills) through the deeds, processes, and performance for the benefit of another entity or the entity itself" (Vargo and Lusch, 2004).

Competency, however, is not limited to knowledge and skills, particularly when it comes to healthcare service activity such as nursing. Nurses also have an element of emotional labor (Hochschild, 2004; Henderson 2001). In health services performed by emotional labor, the individual often works on inducing or inhibiting feelings so as to render them "appropriate" to a situation (Hochschild, 1983). If so, is the human model that includes such factors as knowledge, skill in addressing competency adequate? The past study concluded that this is not the case. A theory of competency models elements such as motives, traits, self-concept, attitudes, values, and skills, as well as their dynamic interactions, in a hierarchical manner (Boyatzis, 1982).

Abuse of technical expertise often causes unexpected tragedy. A former nurse in the German state of Lower Saxony is facing charges for the murder of three patients, and is suspected of further involvement in more than 150 deaths. His excuse, according to the prosecution: boredom[2]. On the other hand, Daniela Poggiali in Italy was arrested on suspicion of killing 38 patients. Investigators claimed she treated murder as a 'challenge' and a 'pleasure'. She allegedly targeted patients she thought

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[2]German nurse killed patients 'out of boredom'. Retrieved as of December 20, 2014 at : http://www.dw.de/german-nurse-killed-patients-out-of-boredom/a-18080531

were annoying or pushy[3]. These cases could suggest that only technical skill does not ensure very safe, satisfactory and adequate nursing services. Rather these malpractices imply the human elements which are different from technical skill are rather salient in ensuring good and safe services. In this context this study might hopefully be able to provide some insight as to the importance of human factors other than technical skill in addressing good and safe nursing services.

Consequently, this study employed the definition and theoretical framework proposed by Spencer who is positioned on the academic stream initiated by McClelland (1973), and further deepened by Boyatzis (1982) and Spencer (1993); that is, competency is an underlying characteristic of an individual that is causally related to criterion-referenced effective and/or superior performance in a job or situation (Spencer, 1993).

3.6.2 Human activity system

A human activity system is a model of a notional system containing the activities people need to undertake in order to pursue a particular purpose (Checkland, 1981; Jackson, 2003). Figure 3-6 illustrates the analytical framework for Chapter 4. The first layer is institutional community of care services, where value of direct care services is co-created amongst such relations including patients, nurses, other medical and health services professionals. This layer is influenced significantly by clinical innovation. The health services professionals including nurses are required to adapt such innovation in clinical settings.
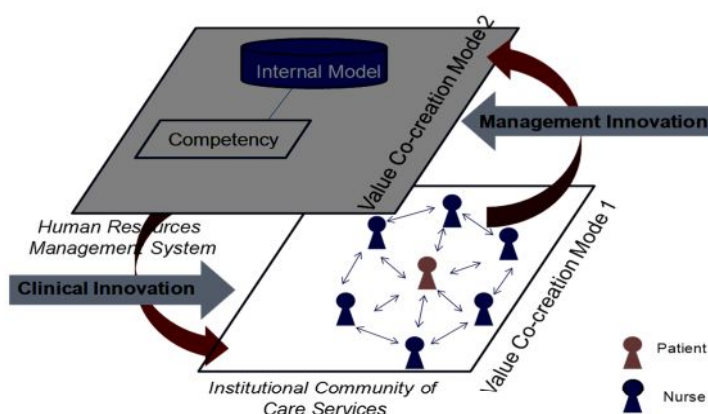
Figure 3-6: Human Activity System

[3] Italian nurse 'murdered 38 patients for pleasure and because she enjoyed the challenge'. Retrieved as of December 20, 2014 at : http://www.dailymail.co.uk/news/article-2798167/italian-nurse-murdered-38-patients-pleasure-enjoyed-challenge.html

The second layer is associated with human resources management which supports the first layer. In this layer such agents as CEO, vice presidents, nursing director, nursing managers and business managers are involved in designing and executing the human resources management systems. Here value co-creation of care services primarily emerged in institutional community of care services is named "value co-creation mode one". The value co-creation emerging at second layers is labeled as "value co-creation mode two".

3.6.3 Human resources management system

Human resources management systems, by and large, support decisions and activities concerning with planning, recruiting, developing, and selecting people primarily by sharing an internal model or "thoughtful picture" of people with various stake holders including top management, managers, leaders and staff. As shown in Figure 3-7, such internal model is a representation of people's competencies, roles and work environment, which is usually linked with required job performance.
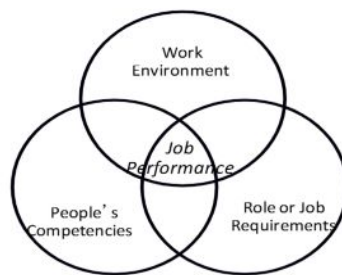
Figure 3-7: Model of Job Performance

Human resources management systems, if they are deliberately designed and operated, not only set direction onto such specific organizational behavior as recruitment, development and selection, but also visualize and share organizational culture and value with the people concerned. When addressing the health services in hospitals, service systems management and design has so far mainly focused on interactions between clinicians and patients based on information and decision support system. On the contrary limited attention has been paid on human resources management system from a service management perspective hitherto.

3.6.4 Value and quality

Quality and value are not isomorphic, however, quality of care is one of the key dimensions of value of care services (OECD, 2012). Measuring quality of care continues to be a challenging issue for decades. One widely accepted method for categorizing indicators of quality of healthcare services is

the approach first conceptualized and proposed by Donabedian that described indicators as being either structure, process or outcome in nature (Donabedian, 2003; Donabedian, 1980).

As shown in Figure 3-8, we presume that value is perceived through the interactions of various actors in unique contexts by those actors involved in the context. In other words, value is phenomenologically created in the process of context generation. At the same time, value of service is subject to the relationships that involve such actors as patients and care givers. Thus, value of service is not objectively determined but subjectively perceived in a different context by the concerned actors who look for viability through interactions with other actors by nesting in a relational context.
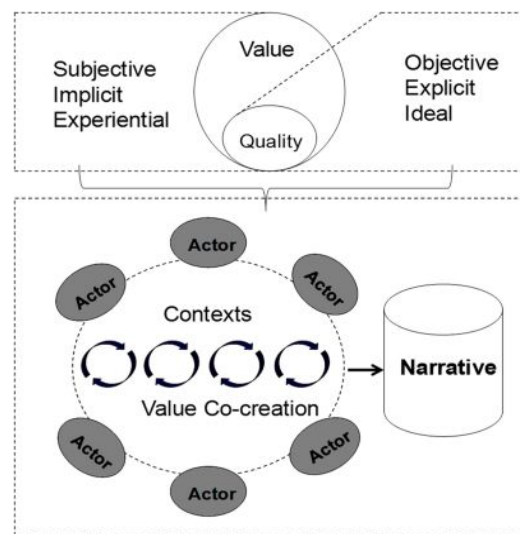
Figure 3-8: Value, Quality and Narrative

Context is recognized as an important dimension of value co-creation because it frames exchange, service, and the potential of resources from the unique perspective of each actor, and from the unique omniscient perspective of the entire service ecosystem (Chandler and Vargo, 2011). Therefore, we constructed a framework to address our research (Chapter 5) using the narratives told by the nurses that involved three process related dimensions: (1) the nurses, as key actors who are responsible for care service provision, uniquely develop, foster and maintain certain relationships with other entities, (2) they apply their competencies (knowledge and skill) through the deeds, processes, and performance for the benefit of another entity or the entity itself (Vargo and Lusch, 2004), and as a result, (3) they including a patient co-create value in a complex network of relationships within which dynamic interactions take place.

3.6.5 Narratives

Narrative inquiry has made valuable contributions to the social sciences because of its "open-ended, experiential and quest-like qualities"(Conle, 2000). Narratives, if it is appropriately told and recorded, can reveal some aspects of embedded resources, relationships and value in context. As such, the narratives told by the nurses form the core of Chapter 4 in exploring and addressing value-in-contexts for caring and nursing services.

Nursing research has had a long history of using narratives as a means to sophisticate direct nursing services to patients. Riessman described narratives that are talk about events that are consequential, events that are temporal though not necessarily told chronologically, and having meaning for the teller and listener (Riessman, 2008). Polkinghorne emphasized that narratives are communicative about events, and that the form/structure of narratives links the parts together in a meaningful, coherent whole (Polkinghorne, 1988). Bruner described the cultural aspect of narratives, in which shared expectations and beliefs are mutually communicated, so that narratives communicate wider social meanings (Bruner, 2001).

Most usage of narratives, however, has been concentrated on patients as the service recipients. A patient has been positioned as a central story teller in most cases. In contrast, this study uniquely focused on the narratives personally told by the nurses. In our study the narratives provided us with the contextual details of a variety of actors, in which they applied their competencies to resolve problems in relation with other actors.

3.6.6 Internal model

Internal models have multiple facets and characteristics. The human behavior in organization is intimately influenced by mental or internal model. "Mental models are deeply held internal images of how the world works, images that limit us to familiar ways of thinking and acting (Senge, 1990). It is subtle since we usually are not very aware of its effect. It is powerful because it determines why and what we should do. Internal models tend to be tacit and conservative. It is often left unquestioned or unchallenged. It calmly forces us to observe what we have always observed before. Behind every action taken and decision made, internal models lie, unconsciously influencing our decisions: regarding why we do, what actions we commit ourselves to take, what outcomes are desirable, and how we involve others, and so forth.

There are many ways to describe functionality and structure of internal model. Mental models can be constructed from perception, imagination, or the comprehension of discourse (Johnson-Laird, 1983). Mental models reflect the beliefs, values and assumptions that we personally hold, and they underlie our reasons for doing things the way we do (Maani et al., 2007). Mental models are sources of information, which one cannot find anywhere else, are available at any time and can be used (Mildeova, 2003; Byrne, 2009). Mental models are based on a small set of fundamental

assumptions, which distinguish them from other proposed representations in the psychology of reasoning (Byrne, 2009). From a "learning" perspective in particular, internal model has been perceived as a key constituency in the process of organizational learning.

3.7 Validity, reliability and ethics

3.7.1 Validity

Validity is expressed through construct, internal, and external validity. Quantitative and empirical method was utilized based on the data obtained by structured questionnaires (Chapter 4). Qualitative and conceptual method was employed based on behavioral event interviews and text coding (Chapter 5). Explorative case study (Chapter 6) and archival descriptive studies were conducted in conformance with two research methodologies, i.e., case study (Yin, 2003) and grounded theory (Charmaz, 2006; Strauss & Corbin, 1998).

Construct validity was accomplished through the usage of multiple sources of quantitative data obtained by questionnaires, and the qualitative data obtained by focus group interviews, behavioral event interview, the project manual, the accepted research proposal submitted to Ministry of Education, Culture, Sports, Science and Technology, by which this study is authorized and financed. In addition the team's documentation, we referred to published articles written by the project team members. Evidence was established through the interviews with not only team members at the XYZ hospital, but also with the faculty team members of the XYZ school of nursing as well.

In Chapter 4 study, internal validity was established by the usage of the tested questionnaire where the terms and theoretical frame defined by McClelland (1997) and Spencer (1993) were translated as attached in Appendix A. Prior to the implementation, Matsushita (2008) had managed a nation-wide survey by utilizing the identical questionnaire for a nation-wide research in cooperation with Japanese Nurses Association. In the research included in Chapter 5, the behavioral event interviews and text coding were strictly conducted in conformance with 'Behavioral Indicators' as attached in Appendix B. The author participated in the training course for conducting behavioral event interview and competency coding offered by McBer (the consultancy established by McClelland and his colleagues) to ensure the methodological strictness and implementation appropriateness. As the empirical evidences all of the interviews were electronically recorded and sexualized and coded results are as attached in Appendix C.

External validity was established through the application of systems theories, namely systems thinking (Jackson 2003), self-organization (Ashby, 1962; Imada 1986), hierarchy (Ahl & Allen, 1996), emergence (Ashby, 1962), learning (Argyris, 1999; Senge 1990), competency (McClelland 1973; Spencer 1993) and human resources management (Milkovich, 1985).

3.7.2 Reliability

The research in chapter 4 and 5 were conducted after obtaining the formal approval from the ethics committee organized at the XYZ hospital and the faculty of medicine of XYZ University. The research protocol was strictly in accordance with the required procedures set by the XYZ hospital and the faculty of medicine of XYZ University. The case study included in Chapter 6 was done upon the request from Japan International Cooperation Agency and National Center for Global Health and Medicine where the author was appointed as an adjunct field researcher/advisor of health services management. The research included in Chapter 7 used an archival and descriptive approach in which 2913 refereed academic paper archived were used.

3.7.3 Ethics

The research in chapter 4 and 5 were conducted strictly in accordance with the required procedures set by the ethics committee of the XYZ hospital. In collecting questionnaires and conducting behavioral event interviews confidentiality was duly protected to safeguard the rights, privacy and anonymity of persons involved. The letters explaining non-disclosure and confidentiality terms were sent to all of the targeted employees prior to the collection of the questionnaires. Also in conducting behavioral event interview, we asked the persons to be interviewed to submit the letter of informed consent in which the terms to the effects that we do not have interviewees stand in a disadvantageous position by no means was included. The author was endowed by the XYZ Hospital with the rights to utilize and publish the data which were obtained in the project work solely for academic purposes. Such data was included in the chapter 4 and 5.

Chapter 4: Value Co-creation of Health Care Services through Competency Modeling

In order to help health services administrators align more effective health services management systems, this study focuses on value co-creation through competency modeling as a crucial factor within community of institutional care services. First this chapter finds that the nurses are heterogeneous group in terms of required competencies. Second, the different roles require different sets of competencies. Third, the urgent needs to adapt innovation in clinical settings also require the nurses to have different set of competencies. Finally this chapter proposes a model, namely evolutionary action research for value co-creation to make shared internal model of competency work effectively in the contexts of value co-creation of care services.

4.1 Introduction

In order to retain, evaluate and develop the nursing human resources, we intend to design shared internal model of competency in order to facilitate value co-creation of care services within the community of institutional care services focusing on such relations as 1) nurses and patients, 2) nurses and nurses, and 3) nurses and other medical and health services professionals. As such we intended to generate debate and insights within the team concerned about the required competencies for the nurses.

University hospitals are deeply concerned with, and involved in virtually all the phases of innovation pipelines of diversified artifacts including pharmaceutical and medical devices (Djella and Gallouj, 2005). At the same time a university hospital is a key institution that plays the salient cues in adapting and diffusing medical and health services innovation in society. Consequently the work environment in university hospital is flooded with adaptation of innovation that are brought about by diversified new technologies that include electric medical record, new medication, new medical devices, medical robot and novel treatment methods to name just a few.

The value of on-the-edge technology is realized only when it is sustainably proliferated and effectively applied to the on-site clinical environment. Therefore enormous amount of time have been consumed in technically training nurses at workplaces to have them prepared for and familiarize with the newly marketed technologies. Nonetheless the executives at the XYZ hospital recognized that ongoing technical education programs do not work very effectively. Here a question was raised, i.e., do nurses utilize the isomorphic set of competencies in adapting new technologies as they do in their daily roles? If they do not, to identify the required competencies to carry out adaptation of innovation would help administrators align alternative training programs to cope with new technologies introduced at the bed side.

4.2 Method

The twenty competency items and six competency clusters are listed in Fig.4-1. The Japanese translation including explanation of each competency item (Matsushita, 2006) was utilized in the questionnaire as attached in the Appendix A.
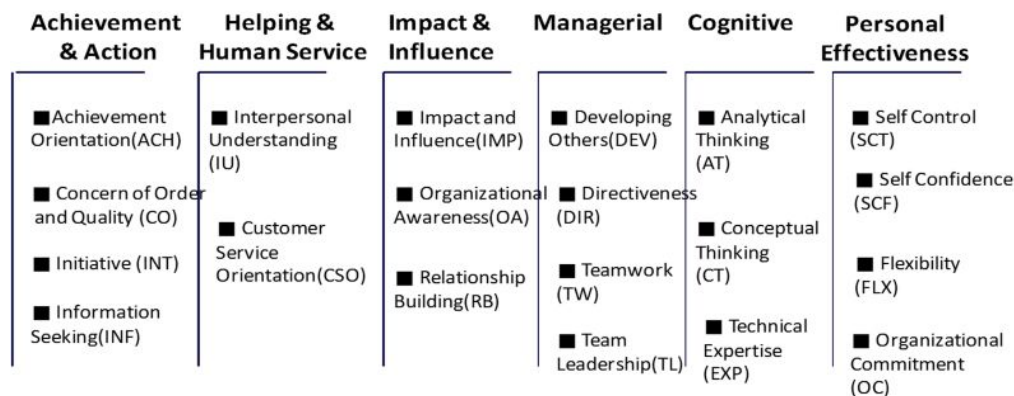
Figure 4-1: Competencies and clusters

4.2.1 Hypothesis

The hypothetical views include (1) if nurses are a homogeneous group in term of the required competencies, then the results of each role group will be identical. (2) Some core competencies will be observed regardless of the types of role, whereas others will be unique to specific role groups, and (3) Nurses expect to utilize different combination of competency from those of their roles in the process of innovation adaptation.

4.2.2 Questionnaire and data collection

To test the above hypothesis the questionnaire including the following questions was developed and distributed 1,235 nurses employed by the XYZ hospital in February 2012 and 797 nurses responded by answering the questionnaires (responding rate: 64.5 percent).

Q1: What are the top six competencies that you think high performing staff nurse should have?

Q2: What are the top six competencies that you think high performing managerial nurses (supervisor, ward manager, nursing administrator) should have?

Q3: What are the top six competencies that you think high performing educational nurses (preceptor, clinical trainer, educational specialist and student trainer) should have?

Q4: What are the top six competencies that you think a nurse should have to correspond to new technology and innovation?

In order to measure the perceived degree of importance, six to one point were simply given to the selected top six items in each of the replied questionnaires.

4.2.3 Action research

The concept of "community of practices" was first proposed by Lave and Wenger. It is through the process of sharing information and experiences with the group that the members learn from each other, and have an opportunity to develop themselves personally and professionally (Lave & Wenger, 1991). The services are shared by "community of service", in which service agents and the shared mental model recursively refer each other. In this recursive process services are fertilized in evolutionary processes.

Action research, as discussed earlier, is a reflective process of progressive problem solving led by individuals working with others in teams or as part of a "community of practice" to improve the way they address issues and solve problems. The action research program that was established at Lancaster and yielded these early successes has been continued in many hundreds of projects since (Jackson 2003). Action research program, one of the representative approaches in soft systems methodologies, enables us to realize co-creative circulation of interaction between cognition and experience (Kijima, 2007).

The effectiveness of internal model of competency depends not only on the model per se but how the model is co-created. The internal model itself could be technically constructed in the second mode exclusively by the team of administrators and advisory members including authors by utilizing their professional expertise. But our approach is different. That is, our approach is unique in that internal model of competency is put on the dynamism of recursive circulations between the value co-creation mode one on the layer of institutional community of care services and the value co-creation mode two on the layer of human resources management system.

4.3 Result

The survey results are summarized as follows:

4.3.1 Stuff nurse
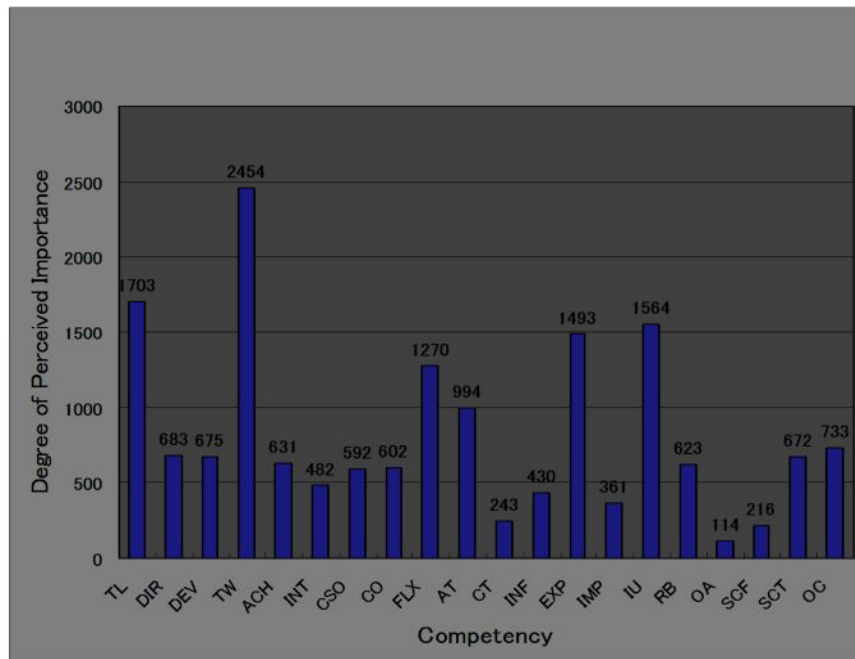
Figure 4-2: Staff Nurse

4.3.2 Managerial nurse
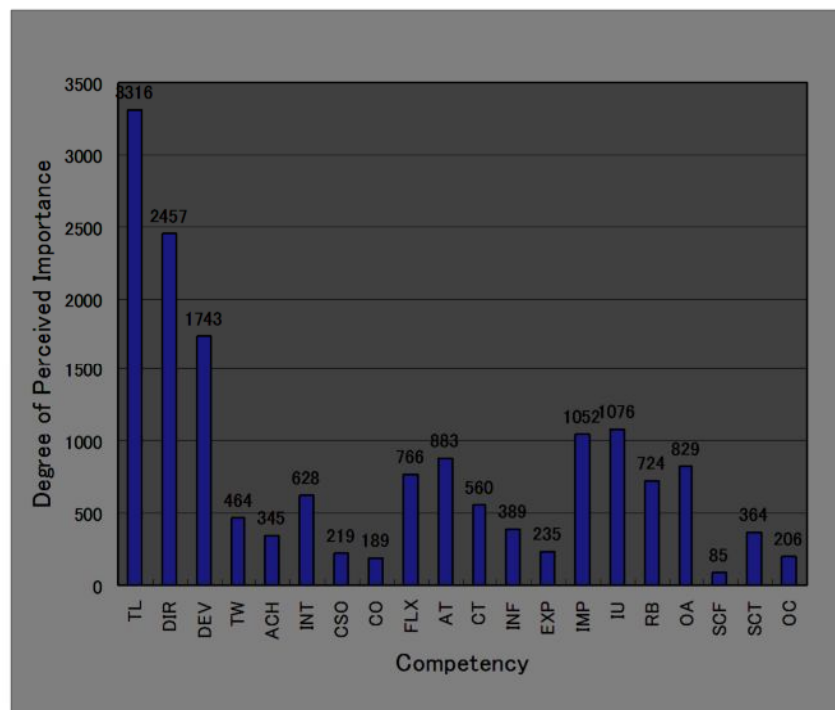
Figure 4-3: Managerial Nurse

4.3.3 Trainer nurse
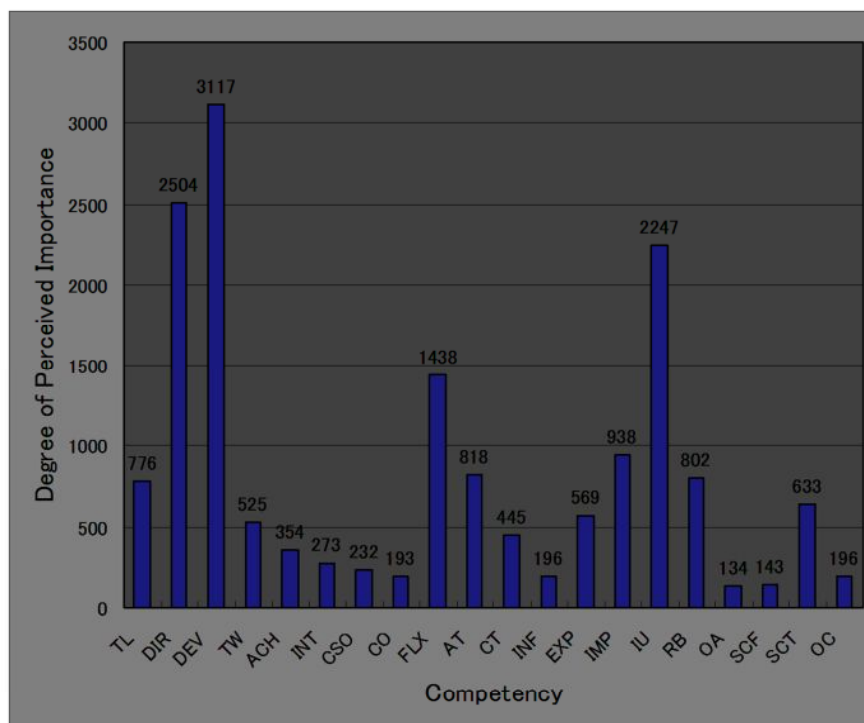
Figure 4-4: Trainer Nurse

4.3.4 Adaptation to new technology and innovation
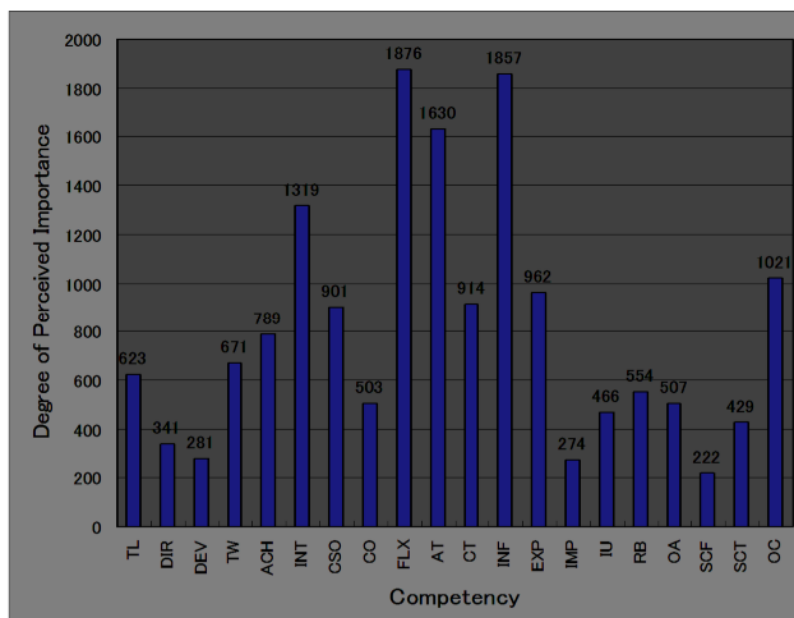
Figure 4-5: Adaptation to New Technology and Innovation

Given the correlation of the total sum of response points of the perceived degree of importance of competencies (1) between staff nurse and managerial nurse, (2) staff nurse and educational nurse and (3) managerial nurse and educational nurse, it is suggested that managerial nurse and educational nurse share commonality, while other sets do not. Plus as implied by the observed variety in the perceived degree of importance of competencies as shown above, the assumed role groups are not recognized very homogeneous in terms of required competencies.

As is shown in Table 4-1, however, the distribution of competencies in rank order shows commonality across the three roles. That is, Interpersonal Understanding (IU) is ranked as the third in staff and educational roles. Directiveness (DIR) is positioned as the second in educational and managerial roles, and Team Leadership (TL) is recognized as the most important competency for managers and secondly important item for staff roles. Developing Others (DV) is put top priority for educational nurses and third priority for managerial role. This suggests that these may constitute the common core competencies in this hospital.

Table 4-1: Common Core Competencies

	1	2	3
Staff	ACH	TL	IU
Trainer	DEV	DIR	IU
Manager	TL	DIR	DEV

A nurse expects to utilize significantly different set of competencies in adapting innovation. The top six competencies in the responses to the fourth question are: Flexibility (FLX), Information Seeking (INF), Analytical Thinking (AT), Initiative (INT), Organizational Commitment (OC) and Expertise (EXP).

4.4 Discussion

4.4.1 Competency

In spite of diversifying specialization in disciplines and roles, nurses have been perceived as a homogeneous group in term of competency in the practices of human resources management. This research reveals that the nurses are not a purely homogeneous group in terms of required competency set. Rather the different role groups require the different sets of competencies, where we observe that there exist the commonly required competencies or core competencies and other collateral ones. On the other hand, the nurses, in pursuit of performance excellence, expect to utilize different combination of competencies from those of their roles in the process of innovation adaptation. The urgent need to adapt innovation emerges serious turbulence not only in nursing roles but also in their competency sets. In competitive university hospital particularly, an emphasis should be put on the development of competencies required by the innovation adaptation not solely on training of technical issues.

4.4.2 Evolutionary action research for value co-creation

Let us construct a conceptual framework as illustrated in Figure 4-6 for explaining dynamics of service emergence between the mode one, i.e., institutional community of care services and the mode two, i.e., human resources management.
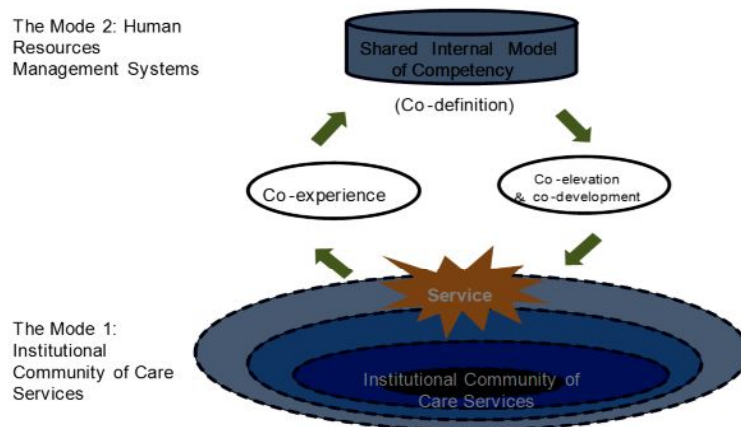
**Figure 4-6: Value Co-creation between HRM systems
and Institutional Community of Care Services**

As shown in Figure 4-6, competency remains as static and explicit knowledge in a verbally written format, whereas the competency, embedded in the institutional community of care services,

becomes externalized though behavior and relations with service agents concerned in a certain field of institutional community. Through sharing the acted-out competencies in a certain field of services in time and apace, services are manifesting themselves exclusively and coherently in content-specific dynamic and complex relations.

4.5 Suggestions

Firstly this chapter suggests that the nurses are heterogeneous group in terms of required competencies. The different roles require different sets of competencies. The urgent needs to adapt innovation in clinical settings require the nurses to have different set of competencies. Such findings of this study provide the management and administrators of the hospital with significant data to design a shared internal model of competency itself.

Secondly this part of research signifies the importance of how the model is created. In the past such human resource management tools as appraisal, assessment and career development programs were exclusively developed in the closed rooms of hospital administrators and managers. We suggest that this approach does not work well nor effectively utilize co-creative relations amongst the concerned. Instead we are able to benefit from putting how or developmental processes of mental model of competency on the dynamism which is co-created in the layer of institutional community of care services (Mode 1) and the layer of human management resource system (Mode 2). By so doing competency modeling can enhance value co-creation which will hopefully result in increasing the quality of healthcare services.

Chapter 5: Value-in-context of Healthcare: What Human Factors Differentiate Value of Nursing Services?

With social issues such as an aging society and sustainability of health services systems becoming of greater concern, decision makers in health services sectors need to identify the human factors that differentiate high performance of health services professionals such as nurses. However, the fact remains that a nursing shortage has hindered such efforts in many countries. What brings about value in nursing services? How is value co-created in clinical settings by nurses? Given that service is the application of competences for the benefit of another entity, this work is an attempt to identify the typology of competencies as operant resources where value is idiosyncratic, experiential, contextual, and meaning laden. Therefore, the objective of the study in Chapter 3, conducted in one of the leading university hospitals that employs 1448 nurses, and with the support of the Japanese government, was to identify the characteristics of human activity systems focusing on the relationships between human competency and value-in-context. This work used the transcript text originally obtained by the combination of the Critical Incident Technique (CIT) and Behavioral Event Interview (BEI). After collecting qualitative data, text coding was performed on the interview transcripts. The findings of the present work contribute to practitioners and theoreticians by providing a bridging concept between human resources management and service systems management. First, our ethnographical research revealed that nurses in different role groups apply different sets of competencies in their diverse job contexts, where there exist commonly applied competencies as well as other collateral competencies. Second, this chapter examines the relationship between competencies in action and contexts. Third, in an attempt to address value co-creation and value-in-contexts focusing on nursing and caring services, this chapter proposes a Meta Value-in-context Transformation Model.

5.1 Introduction

Due to an aging population and technological innovation, the healthcare industry is growing rapidly, where nurses constitute the single largest professional group. XYZ Hospital (a pseudonym solely used for this work), one of the leading university hospitals in Japan, employs 1,448 nurses to deliver diversified health services. The nursing department of the hospital embarked on an initiative to create a new human resources management system to recruit, evaluate, develop, and retain its nursing resources in 2011. The hospital administrator required that the system should be viable in a way that would meet the complex requirements for higher levels of service quality, safety, patient satisfaction, and team development. At the same time, the system was required to be harmonic with the operational systems used by other medical and health services professionals, including physicians, dentists, public health nurses, midwives, nutritionists, pharmacists, medical technologists, radiologic technologists, clinical engineers, physical therapists, and occupational therapists.

Before aligning the detailed components of such a system, we found it necessary to identify the key human factors (if any) that can be used to differentiate the value of nursing services. We assume that these findings will form the basis of the presumed system's detailed configuration design. Accordingly, the analytical framework as shown in Figure 1 is prepare.

5.2 Analytical Framework

Quality and value are not isomorphic; however, quality of care is one of the key dimensions of value of care services (Organization for Economic Co-operation and Development 2004). Measuring the quality of care has been a challenging issue for decades. One widely accepted method for categorizing indicators of quality of healthcare

services is the approach first conceptualized and proposed by Donabedian (1980, 2003) that describes indicators as being either structure, process, or outcome oriented in nature.
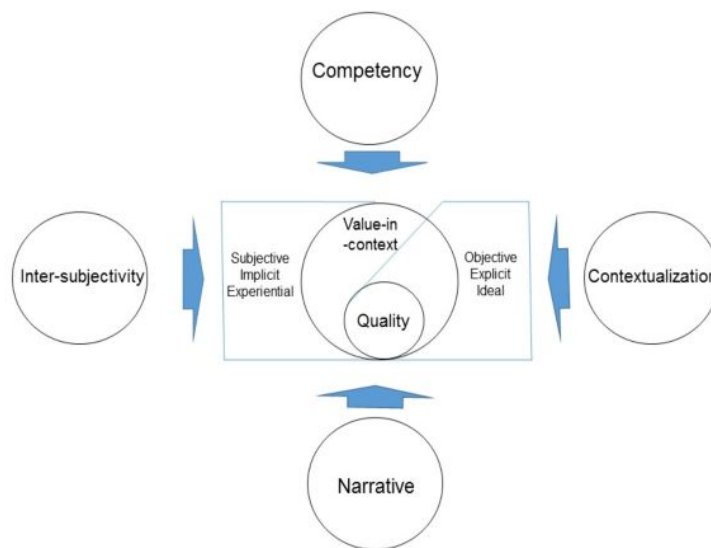
Figure 1: Analytical framework

As illustrated in Figure 1, in addressing value-in-context and service quality, our analytical approach employs four perspectives. First, service quality, an important part of value, is subjectively and phenomenologically perceived in the dynamic contextual process where agents apply their competencies as operant resources. Second, we presume that value is cocreated through contextualization, or the interactions of various actors embedded in unique contexts. Third, such processes can be expressed and obtained in narrative. Forth, intersubjectivity plays a key role in addressing value-in-context and service quality. As such, our study attempts to grasp value-in-context and service quality in terms of competency, contextualization, narrative, and intersubjectivity. Note that a set of narratives plays a salient role as empirical data as well as qualitative data in exhibiting

unique contexts where various agents accommodate diversified competencies to cocreate value through service provision.

Context is recognized as an important dimension of value co-creation because it frames exchange, service, and the potential resources from the unique perspective of each actor and from the unique omniscient perspective of the entire service ecosystem (Chandler and Vargo 2011). Therefore, we constructed a framework to address our research using narratives told by the nurses that involved three process-related dimensions: (1) the nurses, as key actors who are responsible for care service provision, uniquely develop, foster, and maintain certain relationships with other entities; (2) they apply their competencies through deeds, processes, and performance for the benefit of another entity or the entity itself (Vargo and Lusch 2004); and as a result, (3) they intersubjectively cocreate value in a complex network of relationships within which dynamic interactions take place.

Among the aforesaid four analytical perspectives, competency and narrative are positioned as core research methods, and such elements as intersubjectivity and contextualization are utilized as the interpretative tools to conceptualize the outcomes of this research. As such, intersubjectivity and contextualization will be detailed in the discussion section. It would be critical here to further clarify the way we use competency and narrative by reviewing the related literature.

5.3 Method

This study uses the combination of narrative inquiry and competency coding. Narrative inquiry is a way of understanding and inquiring into experience through "collaboration between researcher and participants, over time, in a place or series of places, and in social interaction with milieus" (Connelly and Clandinin 2000, p. 20). Among the diversified methodologies of narrative inquiry, we precisely use the combination of the critical incident technique (CIT) and the behavioral event interview (BEI) to collect qualitative data. The CIT has been used in a variety of service contexts in recent years to explore service research issues, and it has been instrumental in advancing our understanding of these issues (Gremler 2004). As a research method, the BEI was derived from the CIT. A critical difference between the BEI and CIT is that the BEI identifies the competencies needed to do the job well by having interviewees tell vivid "short stories" about how they handled the toughest, most important parts of their jobs; in doing so, they reveal their competencies to do the jobs (Spencer and Spencer 1993). In light of contextualization, our unique research approach is twofold. First, we attempted to capture value-in-context empirically by collecting, recording, and coding real contextual narratives where various agents accommodate competencies in the design, development, and implementation of health services. Second, we intended to capture value-in-context features by approaching multifaceted contextualization through human competencies and service provision.

5.3.1 Step1: Selection of high performing nurses

A high performer is an individual who is a key contributor and continually demonstrates high performance in realizing the quality of health services. It is important to distinguish high performers so that we are able to incorporate their competencies into designing job grade systems, a core part of human resources management systems. We reviewed the past 10 years of personnel appraisal records, recorded and maintained by the human resources development committee of the hospital; the personnel appraisal criteria included factors such as acceptability, accessibility, appropriateness, capacity, capability, continuity, effectiveness, improving health, clinical focus, efficiency, equity, patient-centeredness, responsiveness, safety, sustainability, timeliness, and contribution to improvement and innovation. We found 23 nurses (the top 1.6% of the 1,448 total employed nurses) who, for their contributions to increasing quality of care, were rated as outstanding in personnel appraisals; these nurses were selected as high performers. Out of 23 interviewed 6 persons were married. Those individuals had leave of absence from or had experience of re-employment by the XYZ Hospital.

5.3.2 Step 2: Interview

The authors conducted interviews with the selected nurses. The Japanese language was used in interview sessions. We asked the interviewee to describe the most valuable situations she/he experienced in the job including two "high points" or major success, and two "low points" or key failures. The interviewees (N=23) included: general nurse (N=5), certified nurse (N=4), clinical nurse specialist (N=4), generalist manager (N=5) and trainer nurse (N=5). The time allocated to each sample was 50 minutes.

5.3.3 Step 3: Transcript development

Each of the interviews was electronically recorded and the full transcripts of all the interviews were developed as a text. The developed transcripts encompassing interviews for 23 high performers amounted to 275 double spaced pages with 306,767 words.

5.3.4 Step 4: Coding of competencies

In order to identify the acted out competencies in valuable situations, the authors coded the sentences in which competencies manifested themselves. The list and definition of competencies are attached in Appendix B. Coding was done by the authors based on the coding behavioral indicators attached in Appendix A and mutually counter-checked. The indicators explicitly defined those behaviors that are associated with a competency and are demonstrated by superior performers. The full coded text for 23 narratives and analysis results for 23 individuals are attached in Appendix C.

5.4 Result

As shown in Figure 5-1, in terms of competency cluster high performers did not indicate high scores in every cluster. Instead, the high performers showed an uneven tendency in terms of competency clusters. The high performers indicated high scores in Achievement and Action compared to relatively low scores in Personal Effectiveness.
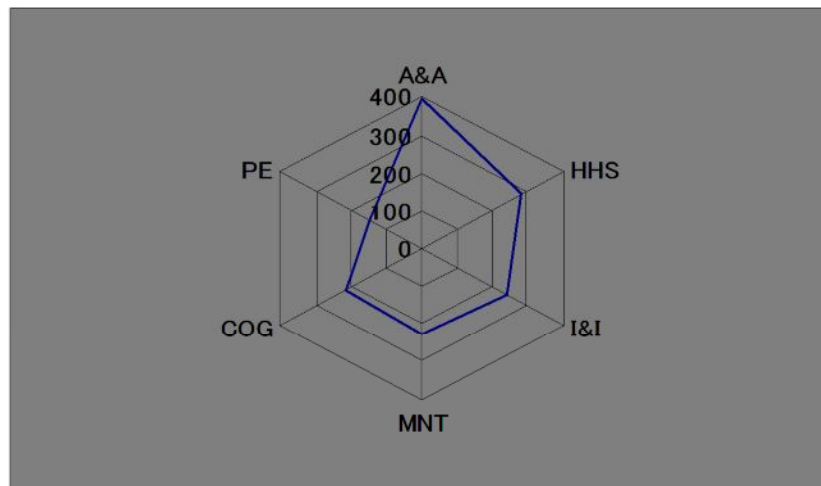
Figure 5-1: High Performers by Clusters

As shown in Figure 5-2 in terms of competency items, the five most frequently observed competencies among the high performers were "Interpersonal Understanding" (score=181), "Relation Building" (score=143), "Achievement Orientation" (score=143), "Initiative" (score=137) and "Expertise" (score=106). On the other hand, "Directiveness" (score=17), "Organizational Commitment" (score=19) and "Organizational Awareness" (score=22) were the three least frequently observed competencies.
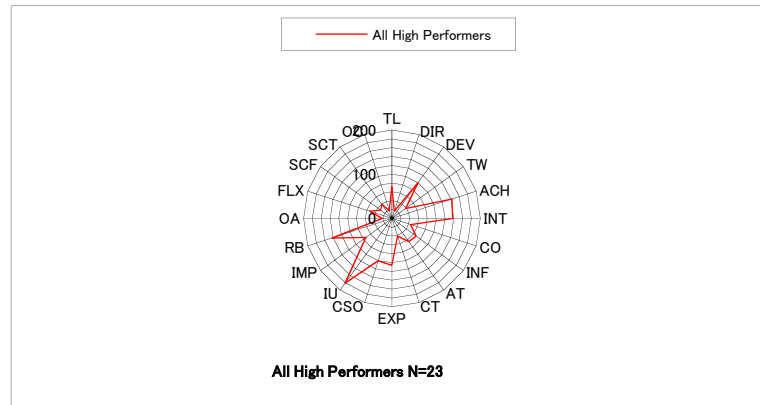
Figure 5-2: High Performers by Competencies

As is shown in figure 5-3, each of the role groups, i.e., General Nurse, Certified Nurse, Clinical Nurse Specialist, Manager and Trainer Nurse has different tendency in terms of competency clusters.
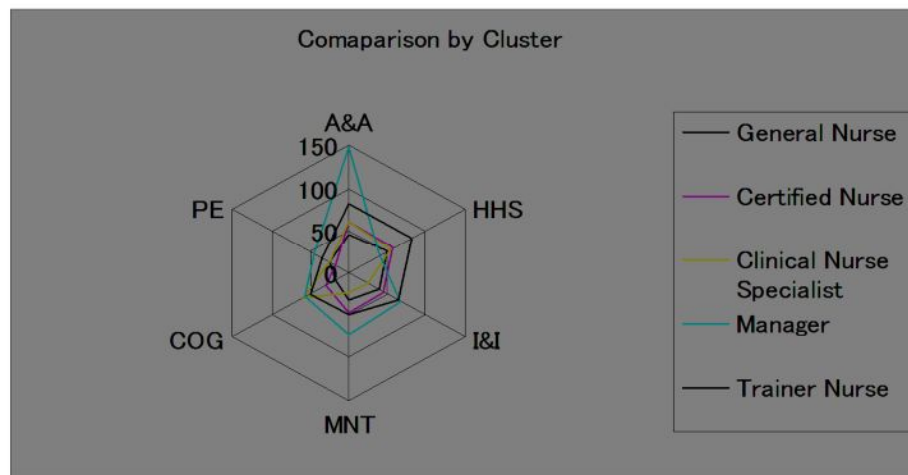
Figure 5-3: Role Group Comparison by Clusters

Figure 5-4 compares the tendencies of high performers in aforesaid five role groups. The high performing nurses in different role groups showed different shaper or tendencies of competency clusters.
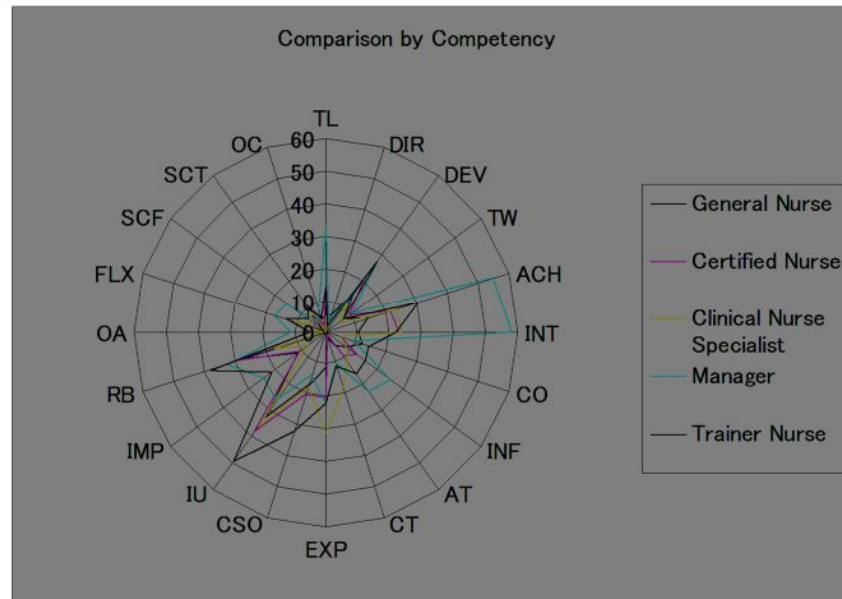
Figure 5-4: Role Group Comparison by Competencies

Note. ACH, achievement orientation; AT, analytical thinking; CO, concern for order; CSO, customer satisfaction ori-entation; CT, conceptual thinking; DEV, developing others; DIR, directiveness; EXP, technical expertise; FLX, flexi-bility; IMP, impact and influence; INF, information seeking; INT, initiative; IU, interpersonal understanding; OA, or-ganizational awareness; OC, organizational control; RB, relation building; SCF, self-confidence; SCT, self-control; TL, team leadership; TW, teamwork.

More precisely, Figure 5-4 breaks the clusters into the 20 competency items by role groups. The nurses who showed high performance in different job classifications showed dissimilar tendencies in the shapes of combinations of competencies.

Table 5-1: Relative Frequency of Competencies by Clusters

	1	2	3	4	5
Generalist	IU	RB	CSO	DEV	ACH
Certified Nurse	IU	RB	INT	ACH	DEV
CNS	IU	EXP	INT	ACH	CSO
Manager	INT	ACH	TL	RB	IU
Trainer	IU	RB	CSO	ACH	DEV

Ordered in accordance with the scores counted.

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Table 5-1 lists the top five competency items in terms of relative frequency measured by scores by role group. Given that Interpersonal Understanding (IU) was observed in rankings of each role group, IU could constitute one of the core competencies for the outstanding nurses. Other core competencies include Relationship Building (RB) and Achievement Orientation (ACH).

5.5 Relationship quality and competencies

Nurses have been perceived as a homogeneous group in terms of competency in the practice of care services management in hospital settings. This research, however, indicates that nurses are not a purely homogeneous group in regards to the competency set they apply while they carry out their roles. Rather, this work revealed that the outstanding nurses in different role groups applied different sets of competencies in their diverse role contexts, although there were commonly applied competencies such as Interpersonal Understanding (IU) and Relationship Building (RB), or core competencies, as well as other collateral competencies.

Relationship quality refers to the overall assessment of the strength of a relationship between two parties and is especially important for conditions where customers face intangibility, uncertainties, a lack of familiarity, and a long time horizon of delivery (Crosby et al. 1990). Relationship quality refers to how the customer perceives quality during the service process (Gronroos 2007). Researchers have tended to conceptualize relationship quality as a high-order construct by clarifying service systems components (Crosby et al. 1990, Kumar et al. 1995, Lages et al. 2005), whereas human competencies affecting relational quality have been rarely investigated, especially in health services. We regard that The Gummesson 4Q model of offering quality is significant in interpreting our survey results. [T]he model combines services and goods elements and is intended to be helpful for developing and managing quality regardless of whether services or physical goods are the core of the offering (Gronroos 2007). In Figure 5-5 we intend to visualize the relations between the typical competencies and the four typologies that constitutes customer perceived quality. Relational quality refers to how the customer perceives quality during the service processes (Gronroos 2007). From a human competency perspective, Interpersonal Understanding (IU), Relationship Building (RB) and Customer Satisfaction Orientation (CSO) can be regarded as factors which assure relationship quality. In other words outstanding nurses are competent and efficient in improving relational quality by highly attentive, empathetic and careful in sharing caring experiences in the various "relations" with patients and actors.

Expertise (EXP) among others can be a human factor that assures technical quality. Technical quality refers to short-term and long-term benefits that can be realized by technical aspects of the offering (Gronroos 2007). Particularly in nursing education an emphasis has been put on developing technical expertise. However this study found that such competencies as Interpersonal Understanding (IU), Relation Building (RB) and Customer Satisfaction Orientation (CSO) ere

commonly and frequently observed rather than Expertise (EXP) in the part of the outstanding nurses who realized excellence in relational quality.

Modified the chart originally presented in: Gummesson.E., Quality Management in Service Organization. International Service Quality Association. 2000 . P80.
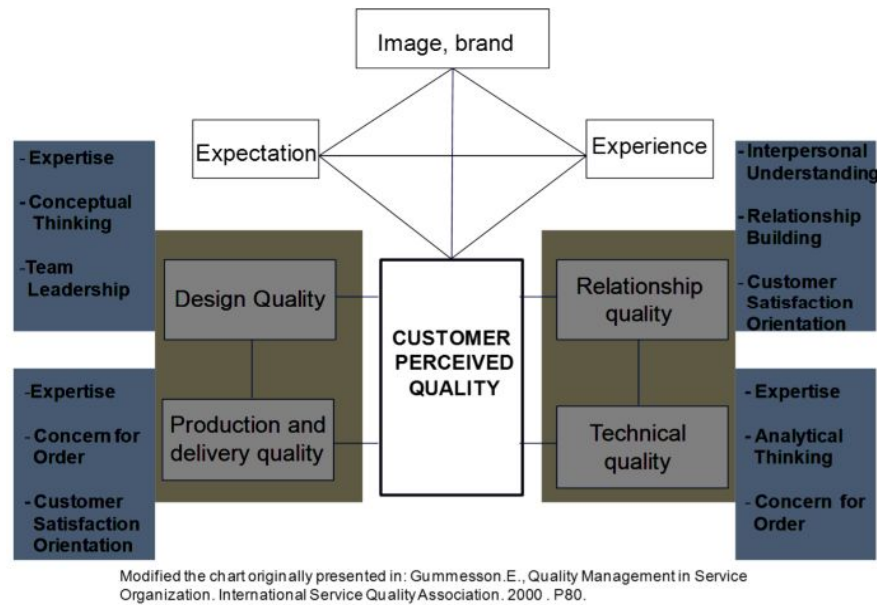
Figure 5-5: 4Q model of Offering Quality and Human competencies

As such, in addressing value-in-context, skill and knowledge elements of competencies are primarily concerned with technical quality. In contrast, elements such as the motive, emotion, trait, self-image, and social role of competencies are related to relationship quality. Technical quality tends to be used and preferred as a lens of provider-perceived quality. Note that customer (patient)-perceived quality involves not only technical quality (as expressed by clinical indicators, effectiveness of clinical intervention and safety, etc.) but also relationship quality. Relationship quality forms the base upon which technical quality is realized and ensured. Relationship quality, one aspect of value-in-context, depends on intersubjectivity in that the quality of the relationship is perceived by agents mutually, simultaneously, and subjectively.

Such competencies as interpersonal understanding and relation building function as a means to ensure intersubjectivity, which influences relationship quality. BEIs with high-performing nurses provide narratives that show their unique commitment to intersubjectivity and relationship quality. For instance, a nurse related to the family members of her patient and their situation in a reflective and emotionally engaged way: "I sat with the widow woman when her husband passed away due to his terminal cancer the woman said her sad story, and said she at last forgave himself for being so selfish and cruel to her. We sat together and we cried." For another nurse, customer satisfaction orientation went beyond what was expected for a salaried employee: "On an off-duty day I attended the first

anniversary of my patient's death [held at his family's residence]….. I was so surprised to see his relatives crying for joy when they saw me there. I just wanted to be there."

From a human competency perspective, interpersonal understanding, relation building, and customer satisfaction orientation can be interpreted as human factors that ensure relationship quality. In other words, outstanding nurses are competent and efficient in improving relationship quality by being highly attentive, empathetic, and careful in sharing caring experiences in their various "relations" with patients and other actors. Technical expertise, among other competencies, can be a factor that directly influences and ensures technical quality.

5.5.1 Competency in value-in-context

This paper attempts to propose a more comprehensive understanding, definition, and utilization of competencies in addressing value-in-context in care services. It was Nishida (1921) who first conceptualized *ba* to discuss the issues related to the creation of meaning and the nature of objects and subjects. To address the emergence of knowledge in modern corporate settings, *ba* has been redefined as "shared context-in-motion" by Nonaka and Toyama (2007), who observed that context is constantly evolving.

In cocreating value in a certain context, actors interact constantly in ever-evolving contexts subjectively and dynamically. Thus, the shared context-in-motion inevitably depends on intersubjectivity. Intersubjectivity is conceptualized among those who pay attention to that embodied feature as implicit and often automatic behavioral orientations toward others (Merleau-Ponty 1945, Coelho and Figueiredo 2003). Gillespie and Cornish (2010) conceptualized intersubjectivity as the variety of relations between perspectives. In our definition, intersubjectivity is interpersonally and transpersonally perceived as "our" subjectivity when actors in a shared context-in-motion holistically interact with each other. Here, holistic means that actors interact not only through such layers as knowledge and skill but also through the multiple layers involving personal motives, emotions, traits, and self-concepts, which tend to be latent and hidden.
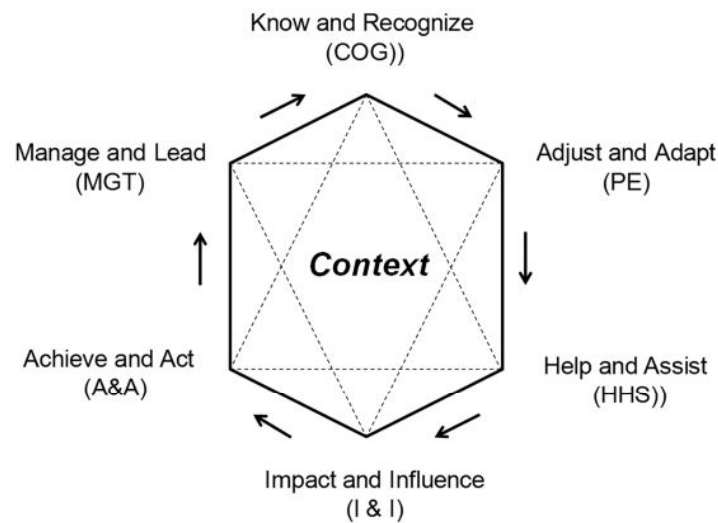
Figure 5-6: Competency at Value-in-context Model

Based on the above discussion, let us construct a model as shown in Figure 5-6. In this model, value-in-context is inter-subjectively realized by the application of competency set in context-in-motion. Here, contextualization or the application of competency is realized through the combination of the six competency cluster sets: (1) know and recognize context, (2) adjust and adapt context, (3) help and assist context, (4) impact and influence context, (5) achieve and act in context, and (6) manage and lead context.

The high performers intervene in context through the combination of six angles. However, the frequently applied clusters and competencies differ from one context to another. For example, generalist managers tend to use the "Achieve and Act" angle, Achievement (ACH) and Initiatives (INT) as competency items, in their intervention to the context. Trainer nurses are inclined to apply the "Help and Assist" angle represented by Interpersonal Understanding (IP) and Relationship Building (RB) in an attempt to establish relationships with actors. Clinical nurse specialists are more likely to apply the "Know and Recognize" angle, or more specifically their Expertise (EXP).

5.5.2 Meta value-in-context transformation model

Let us deepen our exploration of value-in-context and contextualization to encompass an epistemological perspective. Here, our question is simple: How does an outstanding agent get context evolved toward value co-creation? One of the first scholars that defined contextualization in discourse analysis was Gumperz (1982); he defined contextualization in relation to discourse analysis as the process through which participants in a conversation communicate inferences so as to "foreground or make relevant certain aspects of background knowledge and to underplay others" (p. 131, italics in original).

With contextualization positioned as a dynamic process where diverse agents interact mutually in institutional settings, the dualistic concepts of recontextualization and decontextualization have been frequently discussed by scholars and practitioners. Recontextualization is typically defined as a process that extracts something from its original context in order to introduce it into another context, which results in the dynamic transfer and transformation of something from one discourse/text-in-context to another (Linell 1998).

Decontextualization occurs when language becomes separated from its "social and cultural contexts of production and reception" (Bauman and Briggs 1990, p. 72). In organizational studies as well as knowledge management, contextualization is recognized as a key element in addressing organizational change, idea translation, and sensemaking (Czarniawska-Joerges and Sevón 1996; Nonaka and Konno 1998; Weick 1979, 1995). In this research stream, a study addressing the relationship between quality management and human resources management recognized "contextualization as [a] translation process from idea to practice" (Skålén et al. 2005, p. 737). Cocontextualization and transcontextualization are new concepts developed through this empirical study so as to better address the translational feature of dynamic contextualization processes. The observation on the emergence of innovation in a community could give us some indication of the relationship between agent and context. Agents that are extremely intelligent, autonomous, and highly confident not only have diversified competence but also try to seek powerful and suitable counterparts by constantly applying their unique talents and abilities through a variety of real and virtual networks (Takahashi et al. 2004). Given that a network, as a unique mix of diversified agents and relationships, is subsumed in context, prominent professionals strive to share and mobilize value-in-context in order to cocreate value in their networked contexts. The high performers not only intervene in context per se but also transform and translate the very nature of context.

It was observed in the narratives that there were five major integrated behavioral features that translate and evolve the nature of context and generate value. By exploiting such translational interactions between agent and context, we constructed a model, the meta value-in-context translation model (see Figure 5.7).
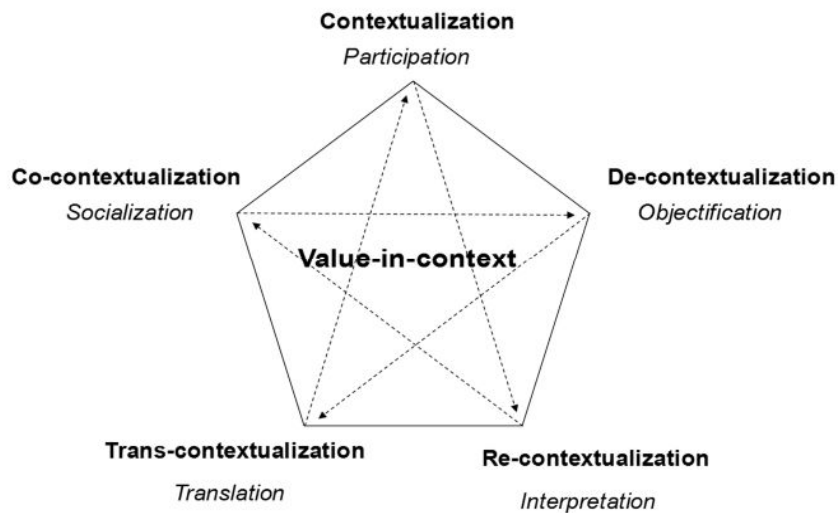
Figure 5-7: Meta Value-in-context Transformation Model

Based on the analysis of the coded narrative texts, Table 5-2 illustrates the typology of a context-in-motion underlying event, and action and consequences. Some of the most frequently observed verbs characterizing each of actions and consequences in the narratives are also listed in this table. By examining these observations closely, we can recognize that outstanding actors have five types of behavioral characteristics: (1) they interact and participate in a new context by establishing and taking part in new relationships with other actors (contextualization). (2) They interpret, perceive, and experiment with the newly encountered context through their lenses (recontextualization). (3) They share and synchronize the new context with other actors including patients, their family members, and other medical and healthcare professionals (cocontextualization). (4) Following cocontextualization, they objectify the context as an object by generalizing, modeling, and even prototyping what they observe in their practices (decontextualization). (5) They transform, transfer, and bridge various contexts together and cocreate a new context that did not exist previously (transcontextualization).

Schumpeter (1934) described the notion of innovation as a result of new combinations of ideas; however, he never mentioned where new combinations took place. In our model, a new combination occurs in context. Convex combinations of ideas at the service frontier occur through transcontextualization after ideas are filtered and translated through contextualization, recontextualization, cocontextualization, and decontextualization. For instance, an outstanding clinical nurse specialist, along with her physician and nurse colleagues, was successful in cocreating a new care unit specifically designed for child cancer patients by translating her clinical practices in the intensive care unit, pediatrics, and palliative care. She added or cocreated value by bridging the different contexts in which she was involved.

The outstanding actors typically interact and participate in a new context by establishing and taking part in new relationships with other actors, and they make their own context (contextualization). They interpret, perceive and experiment with the newly encountered context through their lenses (re-contextualization). Then they share and synchronize the new context with other actors including patients, their family members and other medical and healthcare professionals (co-contextualization). Following co-contextualization, they objectify the context as an object by generalizing, modeling and even prototyping what they observe in their practices (de-contextualization). Some nurses are even inclined to abstract their experiences and practices in an attempt to construct models and theories, then write academic papers for academic journals of nursing and medicine. They convey, transfer, translate and bridge various contexts together and co-create new context that did not exist previously (trans-contextualization).

Schumpeter described the notion of innovation as a result of new combinations of ideas, however, he never mentioned where new combinations took place (Schumpeter, 1934). In our model new combination occurs at context. Convex combinations of ideas at the service frontier occur through trans-contextualization after ideas are filtered and transformed through contextualization, re-contextualization, co-contextualization and de-contextualization. For instance an outstanding clinical nurse specialist was successful in co-creating, with her physician and nurse colleagues, a new care unit specifically designed for child cancer patients by translating her clinical practices in the intensive care unit, pediatrics and palliative care. She added or co-created value by bridging the different contexts in which she was involved.

Table 5-2: Context-in-motion, underlying Event, Actions and Consequences

Typology of context-in-motion	Underlying event	Action and consequences
Contextualization	Participation	Join, intervene, take part in, obtain intuition
Re-contextualization	Interpretation	Experiment, express, verbalize
Co-contextualization	Socialization	Share, empathize, synchronize
De-contextualization	Objectification	Generalize, abstract, model, prototype
Trans-contextualization	Translation	Bridge, realize new combination, diffuse

From Table 5-2, we can infer that value in shared context-in-motion is brought about by the dynamic and mutually recursive interactions among the characteristics of contextualization, recontextualization, decontextualization, cocontextualization, and transcontextualization, where diverse competencies are intersubjectively synthesized in ever-transforming contexts. Such dynamic human intervention in and interaction with contexts keeps each context in an evolutionary state, or context-in-motion. Hence value co-creation emerging as context per se is transformed, where multiple agents including caregivers and patients change the feature of contexts by applying their competencies. When multiple actors are involved in context-in-motion, this process recursively produces intersubjectivity. The translational behavioral feature of transcontextualization brings about innovation in healthcare services, which in turn allows the actors to be involved in the new contextualization.

5.6 Concluding Remarks

Methodological Limitations

According to Pajares (2007), methodological limitations are potential weaknesses of elements of a study of elements such as design, conduct, analysis, sample, and bias (threat to internal validity), which are impossible to avoid. Choices of theoretical foundations for this research study resulted in limitations. This study utilized the theoretical model of competency primarily developed by McClelland (1973) and further cultivated by researchers such as Boyatzis (1982), Dalziel (1979), and Spencer and Spencer (1993). There may be other models and theories that could have been used; nevertheless, we chose this model because it has been broadly accepted in this area of this study. This study focused on high performers; however, in future research it will be necessary to compare the tendency of low or average performers to further elicit the distinct competencies of high performers. This work was an attempt to reframe the generation of value-in-context of healthcare services through such elements as competency, narrative, and contextualization. The factors that differentiate the value of nursing services include the combination of diverse competencies applied to role contexts and essentially the dynamic transformation and translation of context, which is modeled as a meta value-in-context translational model.

Conclusion

In conclusion, we found that the human factors that differentiate the quality of health and nursing services include the following:

1. Competencies. Such operant resources as competencies, which as a factor is not limited to skills and knowledge but includes emotions, motives, traits, self-concepts, and attitudes, can differentiate quality. In particular, such competencies as interpersonal understanding, relation building, and customer satisfaction orientation differentiate relationship quality.

2. Context. Value co-creation emerges in systems of dynamically evolving value-in-context where various agents intervene contexts by accommodating their diverse competencies. The dynamic service context, in which value is cocreated by agents, recursively and constantly influences and differentiates the quality of health services. Therefore the management of shared context-in-motion bears critical importance to ensure quality.

3. Translational enabler. As to the fundamental components of systems, Kijima (2010) proposes to observe system as:

$$System = (agent, relationship)$$

Whereas in accordance with the discourse on quality of services provided by Gummesson (2000), experienced quality could simply be expressed as:

$$Service\ Quality = Technical\ Quality\ X\ Relationship\ Quality$$

Here note that the translational enabler, it is to be observed, is two-fold; one is agent-focused such as technical expertise that could enable one to improve and realize technical quality, and the other is relationship-focused competencies including relationship building, interpersonal sensitivity and team leadership that could enable one to influence and assure relationship quality.

4. Value-in-context translation. Service agents dynamically translate value-in-context constantly in a shared context-in-motion by applying diverse competencies. The dynamic value-in-context translation recursively affects and differentiates the multifaceted quality of health services. To manage the shared context-in-motion or value co-creation of human activity systems that provide services, the meta value-in-context translation model could prove helpful.

We approached value co-creation features through empirically capturing value-in-context by narrative and contextual analyses to address the quality of health services. Consequently, this study allowed the new approach to integrate human resources management, contextualization, and service

systems management in addressing value co-creation in health services. Among numerous artifact elements, we delineated context as the locus of value co-creation. Value is intersubjectively, implicitly, and empirically cogenerated through the application of competencies in the shared context-in-motion. Where there is a human activity, there is a context. Since human activity invariably exists on contexts, the intervention, if any, in human activity systems is not effectively realized without recognizing context. Therefore, this work proposes the meta value-in-context translational model to better recognize and adapt the transformative and translational nature of context. In this regard, the model would be useful when, for example, designing and implementing human activity systems through a "context-based" action research program comprising such elements as participation, interpretation, socialization, objectification, and transformation.

Chapter 6: Asia-African Translational Community of Practice in Value Co-creation of Health Services

This chapter explores the translational features of community of practices in value co-creation by descriptively analyzing the practical and theoretical aspects of the 5S-KAIZEN method in Asia and Africa. The five Ss is originally derived from the Japanese words "Seiri", "Seiton", "Seiso", "Seiketsu", and "Shitsuke". In English the five Ss mean "Sort", "Set", "Shine", "Standardize", and "Sustain". The sequence of 5S focuses on effective work place organization and standardized work procedures. As such the combination of 5S (sort, set, shine, standardize and sustain) and Kaizen (continuous improvement) is originated in the operational management methodology of Japanese manufacturing sector while the theories related with continuous improvement focusing on quality control was derived from the United States. In recent years, however, the objects of the 5S-KAIZEN method have been transferred from the traditional manufacturing activities to the value co-creation activities of service sector including health care and medical services. The 5S-KAIZEN method is now utilized not only in Japanese health services but also in the global health services community including Asia and Africa. These days a number of health services institutions in Africa have effectively introduced the 5S-KAIZEN method in order to improve the levels of quality, safety and work environment in African countries.

6.1 Introduction

As a consultant of health services systems and policy formation, the author has been involved in sharing the 5S-KAIZEN method with the leading practitioners in health services in such countries as Benin, Burkina Faso, Burundi, Eritrea, Kenya, Madagascar, Malawi, Mali, Morocco, Niger, Nigeria, Senegal, Sri Lanka, Tanzania, and the People's Republic of the Congo. Based on the participatory observation and action research, the purpose of this chapter is to analyze descriptively the 5S-KAIZEN method from the perspectives of systems thinking and service systems management. As is introduced in Chapter 3, the method of this work was case study/explorative analysis based on participatory observation. The focus was to analyze and describe the methodology from a systemic point of view by reviewing the improving practices in African health services. First, this part briefly reviews the stories of practices of the 5S-KAIZEN method in some of the African countries. Second, the translational aspects of the methodology will be described. Third, systemicity of the methodology will be descriptively analyzed from such perspectives as 1) holism and hierarchy, 2) communication and control, and 3) evolution.

6.2 Plan-do-check-action cycle

In KAIZEN or continuous improvement Plan–do–check–action (PDCA) cycle is introduced. PDCA cycle is a four–step model for carrying out continuous improvement. Just as a circle has no end, so the

PDCA cycle is repeated time and again for continuous improvement. The PDCA cycle introduced with pay for performance plan is based on extrinsic motivation, whereas the PDCA cycle introduced with the 5S-KAIZEN method is linked to intrinsic motivation rather than extrinsic motivation.

This cycle provides a method with agents involved to co-create knowledge by conducting small-case action research studies in workplaces usually starting with asking such inquiries as; What do we try to accomplish?; How will we know that a change is an improvement?; What changes can we make that will result in an improvement? PDCA is theoretically based on the "Shewhart cycle," and was made popular by Edwards Deming to Japanese manufacturing industry, considered by many to be the father of quality control of the modern age. During his stays in Japan in the 1950s, when he made numerous lectures and seminars on quality control, Deming noted that the Japanese participants shortened the cycle's steps to the now traditional plan, do, check and act even though he preferred "study" rather than "check"[4].

6.3 Short stories of the 5S-KAIZEN method practices

6.3.1 Story one: Sri Lanka

Dr. Wimal Karandagoda, president of Castle Street Hospital for Women, began applying the 5S-KAIZEN method to improve quality of care, safety and job satisfaction for the first time in Sri Lanka in 2000. When he was appointed the position he found that the hospital was very dirty and dilapidated, many patients were dying due to the poor level of patient care (Handa 2012). Learning the 5S-KAIZEN method widely practiced in the manufacturing industry in Sri Lanka, he began using 5S to improve the work environment of his hospital. Initially the labor union of the hospital was very against his attempts, however, the employees gradually began practicing 5Ss.

These improvements paved the pathway for the decrease in the maternal, neonatal and perinatal birth rates and still birth rates. Further, there was an improvement in the post-surgical infection rates. The preventable maternal death is zero for the past few years. In 2004 Castle Street Hospital for Women was awarded "Quality Award" by the ministry of industry of Sri Lanka. Due to the following achievements, this hospital was declared as the Focal Point for National Quality Assurance Program by the country's Ministry of Health. Since then senior and middle level managers of other hospitals in charge of quality improvement had been trained at Castle Street Hospital for Women. As such many other hospitals in Sri Lanka followed the trajectory of Castle Street Hospital for Women to improve quality and safety in their hospitals (JICA 2008).

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[4]Deming, W. E.(1986). Out of the Crisis. MIT Center for Advanced Engineering Study.

From 2007 with the assistance from Japan International Cooperation Agency and Japan Medical School, Karandagoda and his Japanese colleagues began standardizing the 5S-KAIZEN method for the counterpart hospitals in India, Bangladesh, Thailand and African countries.
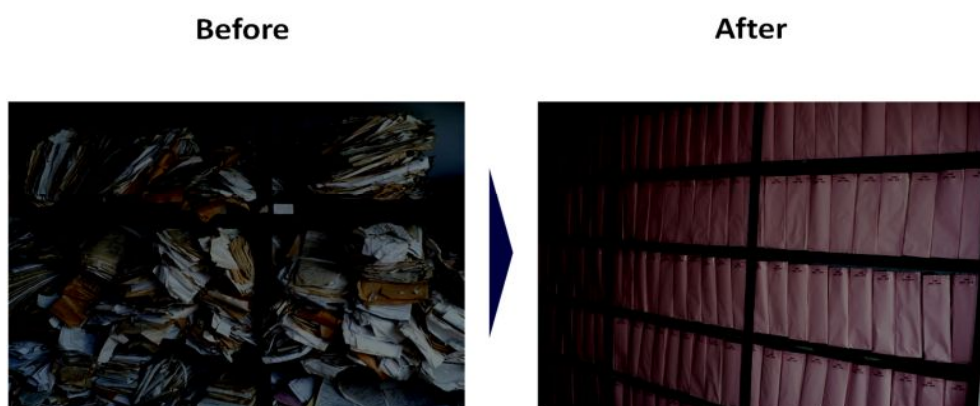
Figure 6-1: Storage of Medical Records

6.3.2 Story two: Tanzania

Tanzania has suffered from a serious shortage of human resources in the field of healthcare (WHO 2006). As of 2010, public medical institutions had only about 40% of the personnel they needed, and more than 20,000 specialist posts remained unfilled. A lack of resources overall, as represented by that of personnel, is said to be the source of the nonexistent improvement in quality of services provided by healthcare facilities.

When "Clean Hospital Program" was launched in 2007, Dr. E.R. Samky, Director General of Mbeya Referral Hospital was the first person that raised his hand to participate in the program. After visiting Castle Street Hospital for Women in Sri Lanka he was convinced with the expected outcomes that 5S would bring about to his hospital. Consequently he initiated quality improvement teams and operation improvement teams in every ward of his hospital. A number of staff members refused cooperation, questioning why they specialists had to take part in a house cleaning campaign. Nevertheless the quality improvement team carried on the activities slowly and patiently. The results became obvious: they were able to reduce the amount of dead stock of medical supplies by thirty seven percent. This led to increased level of perceived solidarity among all the employees. In 2010, Mbeya Referral Hospital was ranked the number one in the national hospital audit. Currently the 5S-KAIZEN method movement has diffused throughout the country. As of 2011, forty six hospitals in Tanzania were using the 5S-KAIZEN method. The Tanzanian government has incorporated the 5S-KAIZEN method into its public health policy and management (Ishijima 2012).
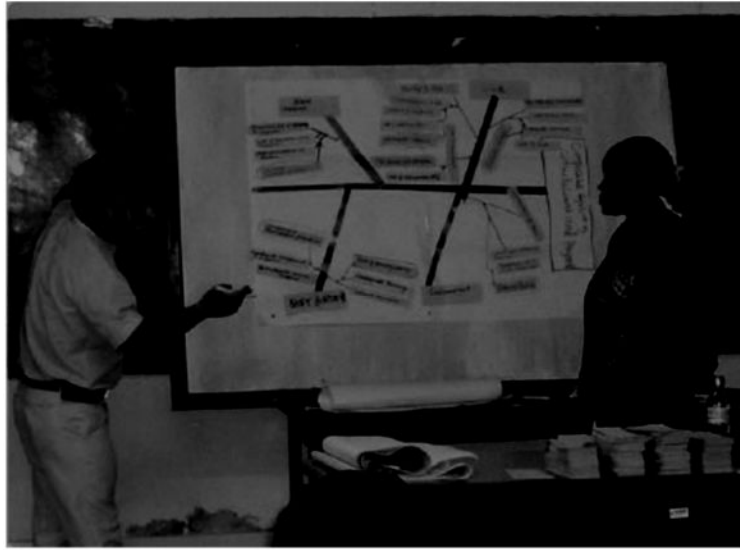
Figure 6-2: Training session of Fishbone Chart

6.3.3 Story three: Democratic Republic of the Congo

GDP per capita of Democratic Republic of the Congo was US$ 348 (IMF 2009). As such this country remains one of the poorest of the world with very limited access to the fee-for-services even in its capital city Kinshasa. After observing the 5S practices of African neighbors, the government appointed Ngaliema Hospital, a national hospital, as a pilot institution to evaluate the effectiveness of that method. Then, Dr. Chamara, president of the hospital organized work improvement teams and quality improvement team in his hospital.

A humble example of improvement was medical record administration. The medical records were in a state of disorderliness and mess. But after the 5S efforts they were kept by year and patient names. Then newly appointed medical record manager began visualizing basic health statistics by using such database. Other outcomes included the decreased waiting time for outpatients, increased quality of services and increased revenue, which enables the president pay the accrued wage and purchase a limited number of medical equipment (Ikeda 2012). In 2011 the Ministry of Health incorporated the 5S-KAIZEN method as a pillar of national health management policy. Sixteen hospitals in the state of Kinshasa are in the process to installing the 5S-KAIZEN method programs into their institutions.

Photos : provided by Dr. Noriaki Ikeda

Figure 6-3: Usage of Medical Statistics

6.4 Kaizen and innovation

Imai (Imai 1997) argues that "the word [Kaizen] implies improvement that involves everyone---both managers and workers---and entails relatively little expense. The Kaizen philosophy assumes that our way of life---be if our working life, our social life, our home life---should focus on constant-improvement efforts." Kaizen or continuous improvement is apparently different from innovation. Kaizen is geared towards incremental change, alteration, transition, and transformation rather than disruptive changes or innovation.

The changes, regardless of whether they are disruptive or incremental, large-scale or small-scale, tend to emerge in three evolutionary stages. Those include such elements as products/goods, processes and services. With servitization being manifesting itself in various industries, decision makers begin allocating and investing resources to realize changes in services offerings. These days, as a result, more attention is being paid to changes in services sectors which include health and medical services.

Source: Presentation prepared by Karandagoda. Sri Lanka. 2011

Figure 6-4: Kaizen and Innovation

The relationship between innovation and Kaizen is simply illustrated in the above figure. Innovation tends to bring about radical and disruptive changes in short period of time, whereas Kaizen is inclined to generate incremental and gradual changes in relatively longer period of time. Technological innovation in particular can be emerged by cross-societal highly sophisticated institutional strategies including research, product development and marketing with abundant resources, whereas Kaizen can be performed by everyone. However, innovation and Kaizen are not mutually exclusive phenomena but they are dependent when they are observed from a long term phenomenological point of view.

6.5 Translational aspects of the 5S-KAIZEN method

Today the term "translational research" is frequently used in medical and health care in advanced countries. The process of translating basic scientific discoveries into clinical applications, and ultimately into public health improvements, has emerged as a salient but complex objective in biomedical research. Here the process can be described as a "translation continuum," since various resources, actions, and processes are involved in this progression of knowledge, which advances discoveries from the "bench to the bedside" (Wolf 1974). Scientific discoveries are translated into practical applications to improve human health. Such discoveries typically emerge at "the bench" with basic research where scientists study disease and then progress to the clinical level or the patients' "bedside." The bench-to-bedside approach to translational research is a two-way co-creation in the translation continuum. In bench-to-bedside, scientists provide practitioners with new tools for practical use in patients and for assessment of their impact. In bedside-to-bench, on the other hand, clinical practitioners make novel observations about the disease that often stimulate further scientific research and exploration.

Note that another kind of continuum has manifested itself through the 5S-KAIZEN method; that is, a translation continuum that has bridged theory and practice existing so far away in terms of distance; physical, cultural and industrial. Again as discussed above the KAIZEN method derived from the US and Japanese manufacturing industries and has been theorized as a discipline. But the fact remains the forefronts of practices of healthcare services in African countries are utilizing the tool effectively and efficiently. As such we assume a translational continuum that bridges different industrial sectors in different cultures thousands miles apart.

6.5.1 Bridging effects on products/goods, process and services

The 5S-KAIZEN method as a quality control and improvement methodology has been transferred to and adapted by the health services sectors in Japan. A nation-wide study conducted in Japan (Ikeda 2012) indicated that 49 percent of national and public hospitals use the 5S method, 44 percent use the KAIZEN method to improve safety, quality and cost-effectiveness of health services. Thus as a methodology, the 5S-KAIZEN method, deriving from manufacturing sector, has been widely diffused and used in health services in Japan. The 5S-KAIZEN method is translational in that they have been effectively transferred, adapted and utilized as a management tool by the variety agents in manufacturing industry and health services. The 5S-KAIZEN method has translational effects to bridge three different spheres involving products/goods, process and services. The 5S-KAIZEN method is able to improve, integrate and translate the continuum that involves such artifacts as products-goods, process and services in various health care settings. Those include clinical bed-side settings, health services administration of clinics and hospitals, institutions relating with health policy and management.

6.5.2 Adaptability to multiple cultures

The 5S-KAIZEN method, as a tool to improve quality, work environment and safety, has been translated from its home country to African countries. It has created new relations that did not exist before. It has proliferated even to the hinterland of Africa covering forty six countries in Africa, impacting on directly or indirectly the human life of 420 million people, accounting almost half of the population of 820 million (Hasegawa 2012). The 5S-KAIZEN method is translational in that it has been implemented by various institutional agents in different countries with multiple cultures include: Eritrea, Kenya, Madagascar, Malawi, Nigeria, Senegal, Tanzania, Benin, Burkina Faso, Burundi, the People's Republic of the Congo, Mali, Morocco and Niger.

As is shown Table 6-1, for instance, 5Ss have been linguistically translated into African local languages. Translation literally refers to the action of turning from one language to another. At the same time translation enables one to deeply comprehend the meaning embedded in different languages. Indeed translation is the process to enhance the diffusion of the methodology across and within diversified cultural boundaries. As such semantic translationality realized by translation into multiple

local languages has enabled to further transfer, remove and convey from one person, place or condition to another with necessary alteration, change and adaptation.

Table 6-1: Linguistic Translations of Five S

Japanese	English	French	Spanish	Yemen	Egyptian	Russian
整理（せいり）	Sort	Séparer	Clasificar	التصنيف	افرز•	Упорядочение
整頓（せいとん）	Set	Situer	Organizar	الترتيب	رتب•	Организация
清掃（せいそう）	Shine	Salubrité	Limpiar	التلميع	المع•	Опрятность
清潔（せいけつ）	Standardize	Standardiser	Estandarizar	المعايره	اجعلها مثالا•	Чистота
躾（しつけ）	Sustain	Se Discipliner	Mantener	الاستمرارية	حافظ•	Поддержание

Shinhala	Swahili	Malaysian	Malagasy	Burundian	Senegal
සංවිධා (සංවිධාන මය)	Sasambua	Sisih	Sivanina	Kuvangura	Supprimer
සැකසීන් (පුපිළිවල)	Seti	Susun	Sokajiana	Kutondekanya	Systématiser
සෑදීම (පුවිශුද්ධම)	Safisha	Sapu	Sasana	Kubungabunga	Scintiller
සැබෑසුද (සම්මත)	Sanifisha	Seragam	Soratana	Kumenyera	
පිළිපැදී (පිළිපැදීම)	Shikilia	Sentiasa Amal	Saintsainina	Kwamizako	Suivre

Source: Presentation Material
made by Hasegawa.T. 2011

6.5.3 Common tool

the 5S-KAIZEN method provides a common tool of change for different professional agents including physician, dentist, nurse, public health nurse, midwife, nutritionist, pharmacist, medical technologist, radiological technologist, clinical engineer, physical therapist, occupational therapist, and office clerk, to name only a few. Usually the medical and health service professionals are expected to develop and utilize relatively narrow scope of clinical disciplines in their specialized areas. This tendency unfortunately results in the lack of common skill and knowledge that bridged different expertise or silos. This in turn makes it difficult to realize positive changes in cross-functional settings. In such circumstances, however, the 5S-KAIZEN method is able to function as a 'cross-disciplinary' discipline for a variety of professional agents who had been accustomed to functioning as a small silo. Be it ever so humble, such common tool as the 5S-KAIZEN method has helped the users fill the gaps amongst small fragmented silos or specialty. As such a number of people with different clinical backgrounds are now able to find, define and improve problematic situations using this methodology.

6.5.4 Open and free

Changes in today's environment requires us to be adaptive to knowledge. Openness can reduce the costs of access to knowledge and information, costs of transaction, and costs of change. This helps to share the risks and rewards of changes, and accelerate the time required to deliver the changed outcomes to communities. Open innovation is "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively (Chesbrough 2011). Again note that the *contents* explaining the method and methodology of the 5S-KAIZEN method are open except for copy right put on the literatures[5]. It can be freely used and shared – both inflow and outflow– by the concerned agents.

Generally the intellectual properties of methods or methodologies concerning with the newly discovered or developed in bench-to-bed translational settings tend to be protected and claimed exclusively. Such discoverer and developer usually have a financial intention, if it is not limited, to secure their intellectual property rights to safeguard their invested money and the future opportunities of acquiring profits. Except for the simplistic copy rights of documents, however, the intellectual property of the method and methodology concerning with the 5S-KAIZEN method has not been exclusively claimed by any parties for the purposes to acquire or gain monetary profits. As such various agents, including individuals and institutions, are able to access, utilize the methodology pertaining to the 5S-KAIZEN method openly and freely, and create new relations involving new agents as well.

6.6 Embedded simplicity and systemicity

Given the theoretical and translational aspects of the 5S-KAIZEN method as discussed above, the method could bear general applicability as a discipline which goes beyond the system boundaries put by national, cultural and industrial boarders. It is regarded that the translational features of the 5S-KAIZEN method derives from its embedded systemicity, of which system property constitutes three dimensions, i.e., 1) holistic and hierarchical, 2) communication and control, and 3) evolution (Kijima and Jackson 2007).

6.6.1 Holistic changes

The 5S-KAIZEN method is able to bring about holistic changes to each of the layers of the hierarchical structure of health services as illustrated below. Many of the institutions including health and medical teams, its subgroups, clinics, hospitals, medical centers, home care deliverers and community day care centers, interact with patients in order to co-create health services through using such artifacts as

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[5]For example, the method and methodology of 5S-KAIZEN are offered in public domain;
http://www.jica.go.jp/activities/issues/health/5S-KAIZEN-TQM/pdf/text_e01.pdf

medicine and medical device, healthcare services and knowledge. As is explored in the following chapters, numerous health care institutions have found the 5S-KAIZEN method efficient and effective for increasing not only levels of quality of care, safety, patients' satisfaction, but employees' job satisfaction (Ikeda 2011; Hasegawa 2012).

These institutions on the other hand depend upon platform layer. Despite the differences in health policy in countries, platform functions as a frame of a health care system's deliverables, defines how health care institutions are operated and determines what kinds of resources should be allocated and utilized. Therefore platform, when it is appropriately aligned, enables community of practices to transcend disciplinary boundaries towards developing new perspectives concerning with knowledge, healthcare services and development and application of products/goods. Platform is largely restricted by healthcare base which constitutes of infrastructure, social capital, and social security systems.
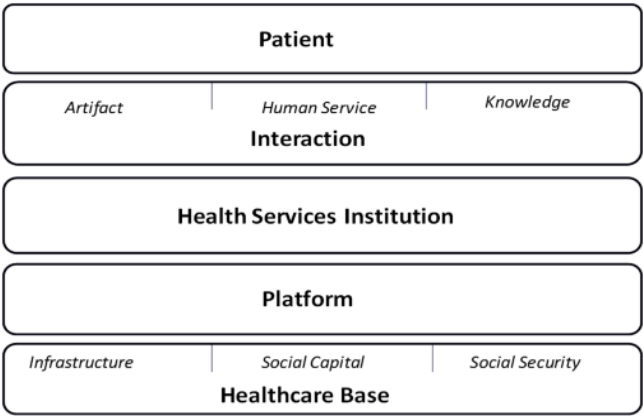
Figure 6-5: Hierarchical Structure of Health Services

Observing that the policy makers have officially introduced the 5S-KAIZEN method as the national health policy and that they have recognized its effectiveness in such counties as Tanzania and Democratic Republic of the Congo (Ishijima 2009, Hasegawa 2012), this methodology has had impact on platform and healthcare base. Consequently the actors using the 5S-KAIZEN method acted as catalysts to induce changes directly or indirectly in the combination of each layer above.

6.6.2 Communication and control

The process of organizational learning occurs when participating agents are collectively able to control their learning experience and communicate their learning experiences each other upon sharing a certain context in common. Given that after introducing the 5S-KAIZEN method a number of institutions have reported the increased degree of clinical index including nosocominal infection rate

and accident/incident rates (Ikeda 2012), some aspects of organization learning manifest in the process of introduction of the methodology at the workplaces.

The concept of "community of practices" was first proposed by Lave and Wenger (Lave and Wenger 1991). It is through the process of sharing knowledge and experiences embedded in contexts within the group that the members learn from each other, and have an opportunity to develop themselves personally and professionally. The successful introduction of the 5S-KAIZEN method depends upon organizational learning progressing at community of practices of each of the institutions.

6.6.3 Evolutionary aspect of learning

The process of learning in nature runs parallel with time. Learning is dynamic; that is, learning in the consideration of time, can be expressed as a recursive cyclic movement between experience (practice) and idea (theory) through the processes of co-experience involving co-definition, co-development (relation-based), co-elevation (agent-based), co-reflection and co-organization as illustrated below.
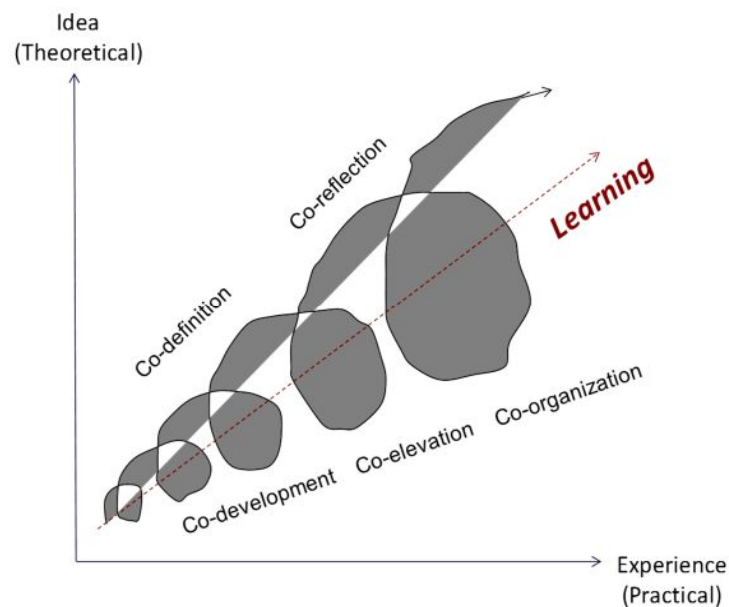
Figure 6-6: Evolutionary Learning based on the 5S-KAIZEN method

In the situations where "the notion of 'problem' and a 'solution' are inappropriate, what makes more sense is a process of learning which is never-ending" (Chambers 1997). Therefore what is essential here is an "enquiry" in the part of practitioners when they encounter problem situations rather than independent and contained problems 'out there'. A never-ending but effective enquiry to grasp and describe the problem situations ensures the process of organizational learning. As is shown in the

following chapters, successful practices of the 5S-KAIZEN method incorporate the learning processes coherently, where each of the participants acts as an actor to enhance the reflective and evolutionary cycle between experience and idea.

6.7 Behind the PDCA Cycle

The systemic changes realized by the movement have gained enthusiastic support from the minister of the central government down to the staff members at hospitals and clinics in countryside in Africa. African people have even produced "the 5S-KAIZEN dance" and "the 5S-KAIZEN song" to encourage themselves to get this movement forward (Hasegawa 2012). Here a question is raised; that is, what makes African people adaptive to the 5S-KAIZEN method?

6.7.1 Participation and inclusion

The management ethos has never been firmly rooted nor included in health services partly because of the poverty, unemployment, inadequate education and political instability. Even employees often steal medicine and equipment from hospital and clinic in some of the African countries. Bribery is said to be frequently practiced behind the scene in immature public sectors.

Social exclusion is a multidimensional process of progressive social rupture, detaching groups and individuals from social relations and institutions and preventing them from full participation in the normal, normatively prescribed activities of the society in which they live (Silver 2007). On the other hand social inclusion, often being an agenda of debate, could be understood as a set of actions to change the circumstances and habits causing social exclusion. The World Bank (2013) defined that social inclusion is the process of improving the ability, opportunity, and dignity of people, disadvantaged on the basis of their identity, to take part in society. According to Nafziger（2000）who analyzed the political and economic tumult at Democratic Republic of the Congo, Mobutu institutionalized corruption to prevent political rivals from challenging his control, leading to an economic collapse in 1996. The corruption of national governance became a major impediment to economic growth and development.

The members of work places in hospitals and clinics, facing with decreased risk for exclusion, tend to need the opportunities in which they can express innately shared resilience in a participative manner at their work places. Those agents are adaptable to the methodology of the 5S-KAIZEN method to ensure more secure and resilient work places.

6.7.2 Intrinsic Reward

Most of the management methodologies and methods if any currently practiced in African countries have come from the West which historically had exploited the continent for over decades. Pay for performance is an emerging payment model in health insurance plan widely practices in the United

States and the United Kingdom. Providers under pay for performance arrangement are rewarded for meeting pre-established targets for delivery of healthcare services. Although in African countries the coverage of health insurance, public and private, are rather limited, pay for performance scheme is used to allocate financial resources at government and aid funds to health services providers. Those practices by and large are based on goal-seeking paradigm; they plan in advance the acted-out results of institutions and team of agent that should be achieved.

Note that Brown（2007) defines that extrinsic motivation refers to our tendency to perform activities for known external rewards, whether they be tangible (e.g. money) or psychological (e.g., praise) in nature. Pay-for-performance can strengthen the goal seeking behaviors that are being measured by stimulating extrinsic motivation, but the literature in behavioral economics suggest that monetary rewards based on pay for performance do not necessarily increase motivation for tasks that are intrinsically rewarding.

Malone and Lepper (1987) have defined intrinsic motivation more simply in terms of what people will do without external inducement. Also Coon and Mitterer (2010) argues that intrinsic motivation occurs when we act without any obvious external rewards. We simply enjoy an activity or see it as an opportunity to explore, learn, and actualize our potentials (Coon et.al, 2010). The 5S-KAIZEN method is generally geared towards to stimulating intrinsic motivation rather than extrinsic motivation in the process-related improvement activities which are not directly covered by pay for performance plan. As such as a management method the 5S-KAIZEN method and pay for performance plan are complementary in that the former is linked to intrinsic motivation and the latter to extrinsic motivation.

6.7.3 PDCA as value co-creation cycle in work place

Action research is a reflective process of progressive problem solving led by individuals working with others in teams or as part of a "community of practice" to improve the way they address issues and solve problems. The action research program that was established at Lancaster and yielded these early successes has since been used in hundreds of projects (Jackson 2003). An action research program, one of the representative approaches in soft systems methodologies, enables the co-creative circulation of interactions between cognition and experience (Kijima, 2007).

There are the conceptual similarities between a PDCA cycle and an action research cycle; those are, (1) learning, (2) cyclic presentation, and (3) change-orientation. First, there exists similarity in terms of learning. Reason (2001) has identified four types of learning: (1) Practical learning; learning "how to" do something and is expressed in a skill, knack, or competence. (2) Experiential learning; learning through a direct face-to-face encounter with a person, place, or thing; it is knowing through empathy and resonance, and it is almost impossible to put into words. (3) Presentational learning; learning emerging from experiential learning and provides its first expression through forms of imagery such as poetry, drawing, sculpture, movement, dance, and so on. (4) Propositional learning;

learning knowledge "about" something and is expressed through ideas and theories. It is expressed in abstract language or mathematics. Note that these types of learning are frequently observable in both PDCA cycle and action research cycle. Second, similarity is observed in terms of conceptual presentation between the two. The two methods attempt to intervene in reality by continuously moving on from a phase to another phase. Both are expressed as dynamic cyclic movement or spiral structure that has no ending. Third, PDCA cycle and action research aim at causing changes in the real world; workplace, community, environment and so forth. Both include purposive and purposeful actions to make a certain change to the targeted phenomenon.

One of the significant differences between PDCA and action research is that the former puts emphasis on 'check' whereas the latter on 'study' in detail and subject to an analysis in order to discover essential features or meaning of cause. This is partly because that continuous improvement has its origin in operations management whereas action learning finds its origin in systems theory. When community of practice progresses PDCA cycle forward, 'check' evolves gradually into reflection sharing based on 'study' in accordance with the degree of proficiency. As such we designed and implemented our PDCA cycle embedded in Kaizen as illustrated in Figure 6-6. In our model, partly based on the value co-creation diagram at Figure 2.1 Service Innovation Model (Gulbran and Kijima, 2009), value co-creation occurred in the combination of PDCA and action research cycle as follows:
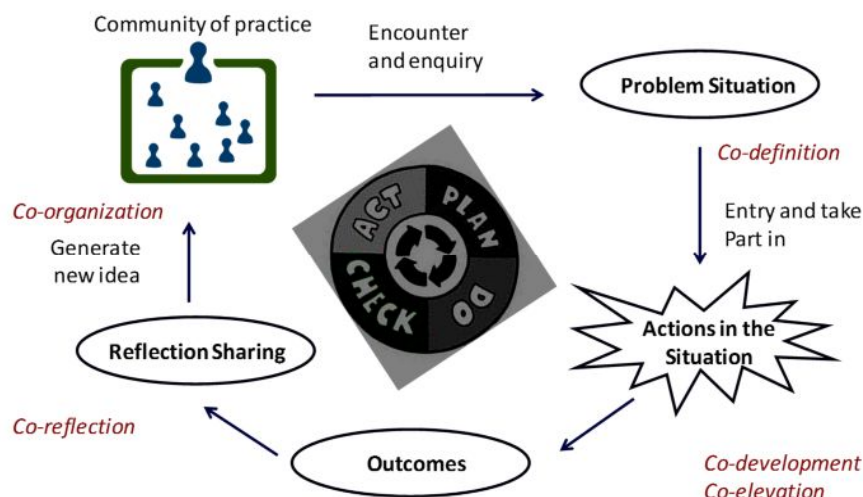
Figure 6-7: Value Co-creation in Action Research-based Learning

- *Co-experience*: The team shares experience and context together. Do, participate, deliver and share experience in the field of service with other agents including a patient.

- *Co-definition*: The team sets objectives by identifying opportunities and barriers, and developing action plans to address the barriers and take advantage of the opportunities in accordance with, for instance SMART criteria (Doran 1981), i.e., Specific; target a specific area for improvement. Measurable; quantify or at least suggest an indicator of progress. Assignable; specify who will do it. Realistic; state what results can realistically be achieved, given available resources. Time-related; specify when the results can be achieved.

- *Co-development*: The team executes co-defined action plan by improving problematic issues (relation-focused).

- *Co-elevation*: The team executes co-defined action plan by improving problematic issues (entity-focused).

- *Co-reflection*: The team collects data and studies whether the solutions are successful in producing the expected improvements. Methods include but not limited to such tools as cause-and-effect diagram (fishbone chart), check sheet, control chart histogram, Pareto chart, scatter diagram and stratification (Nancy 2004).

- *Co-action*: The team monitors the process to identify opportunities for further improvement and takes action to implement them by generating new idea on allocating human resources, material, money, knowledge, space and time.

The Figure 6-7 illustrates value co-creation flow in the 5S-KAIZEN method action research-based learning. In using the 5S-KAIZEN method practitioners are expected to co-define problem situation after encountering the situation. Then they take part in actions in the problem situations by co-developing new relations and co-elevating solutions focusing on relations or entity. Note again that even most novices easily launch out this process by simply sorting and setting things around them in their workplaces. Following those steps each of the agents are able to share reflections (co-reflection) by evaluating the outcomes of their simple intervention. When this collective reflection is satisfactory enough, each members of community of practice are able to generate and obtain new ideas to further intervene into the situations. By so doing the agents can allocate such resources as human resources, materials, money, knowledge and information, space and time (co-action). As a result, the 5S-KAIZEN method is able to enhance not only communication and control but also recursive cycle consisting of co-definition of the problem situation, co-development and co-creation of solutions, co-reflection and co-action of operant and operand resources. An emphasis is put on "co" activities or fostering relations amongst agents rather than stimulating independent goal seeking performance of an agent. As such the practices of PDCA with an emphasis on developing and maintaining relationship among agents is named relation-focused PDCA cycle. Consequently an orientation of 'relationship maintaining' is introduced to the community of practice that accepts relation-focused PDCA cycle.

6.8 Suggestion

Developed countries have focused on assisting emerging and underdeveloped countries in deploying tangible infrastructures including building, bridges, ports, railways and manufacturing plants. However what is more important at least in the longer time span will be to develop intangible assets including management methodology which can be easily understood and implementable. The 5S-KAIZEN method, diffused within Japanese manufacturing industry and health services for decades, the methodology has been transferred to such different sector as health services in Asian and African countries. As a methodology the 5S-KAIZEN method is simple and humble. Be it ever so humble, however, community of practice when coupled with action research-based learning, evolutionary learning cycle, and value system respecting participation-inclusion-solidarity can be disseminated across the diverse countries with different cultures. It is implied that the 5S-KAIZEN method as a translational approach becomes effective as 'systems practices' when it is implemented focusing on (1) enhancing participation and inclusion, (2) embedding intrinsic reward, and (3) progressing relation-focused PDCA as a value co-creation cycle in workplace. Consequently the 5S-KAIZEN method, as a rustic discipline, requires well-fit 'soft systems practices' in order to be effective in practice.

Chapter 7: Innovation in Health Services:
Technology Transfer and Diffusion of Risk Assessment Tools for the Treatment of Pressure Ulcer

This chapter is an attempt to describe the translational aspect of health services innovation by analyzing the processes of diffusion of a particular decision support system used in the field of pressure ulcer care. With the growing challenge of an ageing population, healthcare systems are facing severe disease conditions, such as pressure ulcers, brought about by the increasing length of stays of elderly patients in hospitals. The clinical treatment of pressure ulcer is one of the fields in which significant health service innovation has emerged. For instance, the usage rate of energy-smart risk assessment tools in curing and caring for pressure ulcers amongst Japanese hospitals was 99.8 percent in 2008 compared with 0 percent in 1986. This research is an attempt to identify the underlying factors influencing the innovation and diffusion processes of risk assessment tools utilized in treating pressure ulcers. This work identified four factors contributing to this process: 1) international technological transfer with incremental improvements, 2) a policy-interventional translational research cycle embedded in the academia-government-hospital complex, 3) a product-centric translational research cycle embedded in the industry-academia-hospital complex, and 4) grass roots promotional activities performed by Enterostomal Therapy and Wound Ostomy Continence Nurses.

7.1 Introduction

In healthcare, attention and research interest have been focused on so-called "big ticket" innovations of physical artifacts including pharmaceutical products and medical devices. Less attention, however, has been paid to "small ticket", or unphysical artifact aspect of healthcare technology, i.e., healthcare services provided by health care professionals through clinical procedures. This paper focuses on the latter.

The innovation process is seen as the succession of invention, innovation and diffusion, characterized by a high level of uncertainty regarding the outcomes of these actions (Schumpeter and Opie 1934). In innovation study the process of innovation involving such factors as communication, channel, time and social system is critically important. Diffusion is the process in which an innovation is communicated through certain channels over time among numbers of a social system (Rogers 2003)[6]. In recent years, however, the concept of service has increasingly become important to many fields, including healthcare. By service we refer to "the application of specialized competencies (knowledge and skills) through the deeds, processes, and performance for the benefit of another entity or the entity

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[6]Roger, E.M.(2003). Diffusion of innovation, fifth edition. Free Press. p5.

itself" (Vargo and Lusch 2004). In this context, Service Science Management Engineering and Design (Service Science) is an emerging area of study with pioneering work in the service research areas of service marketing, service operations, service management, service engineering, service economics, service computing, etc. (Chesbrough and Spohrer 2006; Maglio and Spohrer 2008; Spohrer, Vargo, Maglio, Caswell 2008). The recent effort led by service innovation studies in the healthcare sector has also emphasized a broader and systematic approach (Djellal and Gallouji 2005, Gallouji and Windrum 2009). It will be useful to utilize the knowledge and ideas developed in this field to address the innovation of human services in the healthcare field.

From the standpoint of service management, theories of nursing processes include the efforts in organizing, managing and visualizing five major service work steps, i.e., assessment, nursing diagnosis, planning, intervention and evaluation (Matsushita 2005). In all steps, effective nursing service requires deployment of all the knowledge, skills, and competences that a nurse and a care team have to offer for the benefit of a patient. Generally, health service tends to be a time-costly, intangible experience when it is not appropriately organized, managed and visualized between a caregiver and a patient. In this context, a pressure ulcer assessment tool can be regarded as a decision support service tool to organize, manage and visualize the incident risk of pressure ulcers. It could lead to effective nursing diagnosis, planning, intervention and evaluation performed by a nurse and a team of medical and healthcare professionals. With the growing challenge of an ageing population, the cure and care of pressure ulcers is now perceived as an area in which significant health service innovations have manifested. The generally accepted view on traditional and new approaches to pressure ulcers is summarized in Table 1.

Table 7-1: comparison of Traditional and New Approaches of Pressure Ulcer Therapies

	Traditional （〜 1990）	New （1990〜）
Awareness	- Not predictable, cannot be cured. - Pressure ulcer is shame of nurses.	- Predictable and can be cured. - Emphasis on team approach
Risk Assessment	- Intuition and experience	- Utilization of risk assessment tool.
Coping with Pressure	- Not effective with body pad and rubber.	- Effective by usage of special mattresses for pressure ulcer prevention.
Cure Method	-Drying - Frequent change of patient position.	- Moist wound healing

Up to 1990 in Japan, "intuition and experience" had been the predominant way of assessing risk of pressure ulcers and scientific methodology about risk assessment was scarcely utilized in delivering care services at the bedside. As such, the usage of the risk assessment tool for the treatment of pressure ulcers among Japanese hospitals was zero in 1986 but increased to 99.8 percent in 2008 (Ushiyama 2010). What has happened in the innovation and diffusion processes regarding risk assessment tools for the treatment of pressure ulcers? How did the diffusion process occur? Why did the diffusion process follow a certain pattern? What channel were there to facilitate the diffusion? How did the social systems influence the diffusion? How was the social system influenced by the innovation? This work is an attempt to answer these questions.

This chapter, based on a descriptive historical analysis of international and domestic aspects of innovation and diffusion of risk assessment, is an endeavor to identify the underlying factors that influence the innovation and diffusion of risk assessment tools utilized in healthcare services.

7.2 Methods

As a research method, the case study is regarded as a useful way to ask "how" and "why" research questions about historical events over which researchers have little or no control. Archival analysis would be applicable to inquire "what" has occurred in the aforementioned processes. As such, this study is based on a historical descriptive case analysis of the development, innovation and diffusion of risk assessment tools for the treatment of pressure ulcers. First, the historical changes in research and practical interests were surveyed by investigating the titles of 2,913 academic papers and articles published from 1960 to 2010 in both the English and Japanese languages. Secondly, key researchers and their relationships with influential risk assessment tools were identified by further searching the citation relationships and contents of the targeted literature. Archival records accessible through Internet web sites and other records coming from Japanese governmental and professional organizations were then investigated. Thirdly, onsite focus interviews were conducted with selected key researchers and practitioners in order to obtain the qualitative data as to the technological path, improvement areas, comparative advantages of the tools against their predecessors, involvement in translational research, and their influence on healthcare policies.

7.3 Findings and Discussion

In the international English-speaking research community, research knowledge about pressure ulcers has been accumulating since as early as the 1950s, as shown in Fig. 7-1, whereas in Japan the generation of knowledge began only in the late 1990s, as indicated in Fig. 7-2.
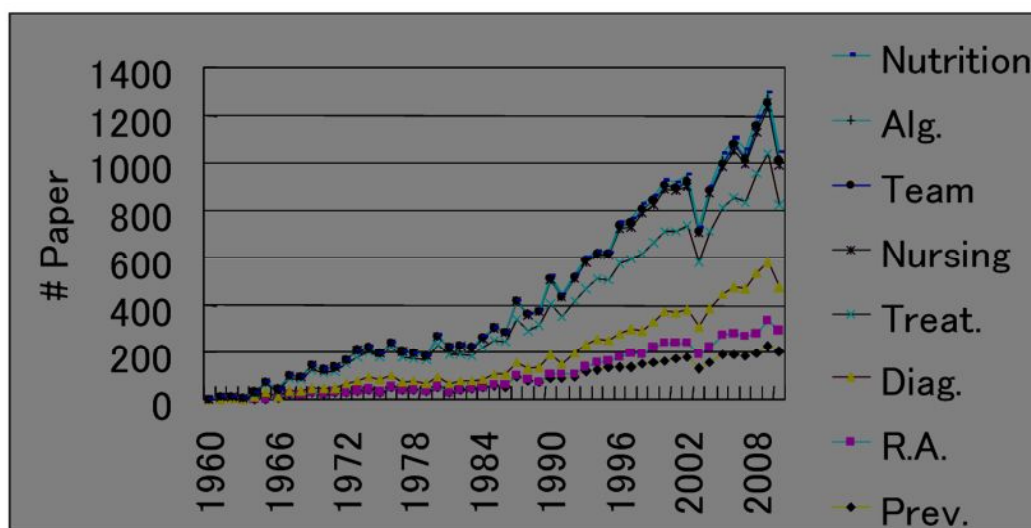
Figure 7-1: Historical Trend of the Titles of English Papers
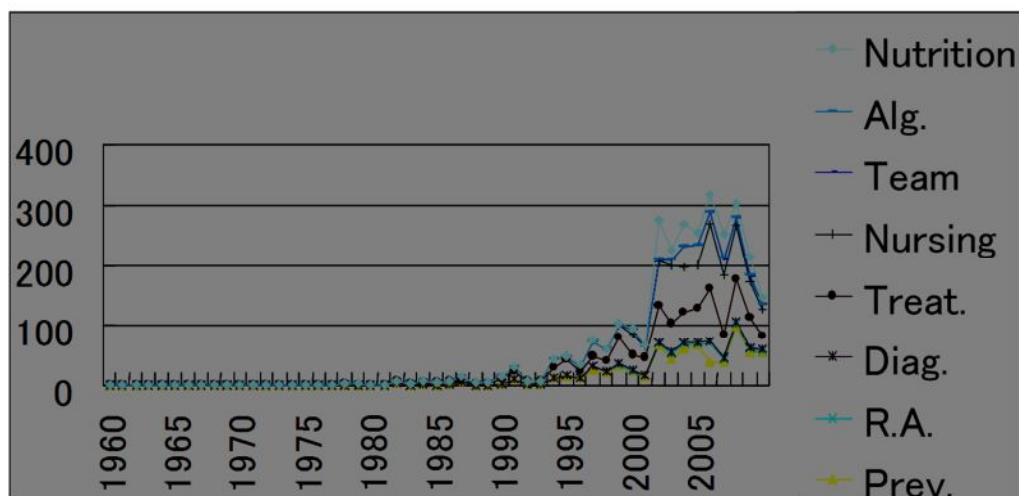
Figure 7-2: Historical Trend of Titles of Japanese Papers

The Japanese literature on pressure ulcer risk assessment tools increased rapidly, particularly after 2002, when the penalty rule of pressure ulcer malpractice was first introduced in the national medical care reimbursement system. While a number of papers have been published by a variety of researchers in the nursing and medical fields in Japan, primarily from the points of safety, clinical effectiveness and validity, no one has addressed the technological transfer path of such tools. Therefore it is necessary to first grasp the technological transfer pathway from an international perspective, in order to identify the underlying factors that have facilitated the innovation and diffusion of pressure ulcer risk assessment tools in Japan.

7.3.1 International technological transfer with incremental improvements

The technological transfer path of pressure ulcer risk assessment tools is identified by reviewing targeted papers. By reviewing papers obtained by a citation analysis utilizing such key words as "pressure ulcer", "risk assessment" and "development", five individuals were identified as key researchers in the field of pressure ulcer risk assessment tools. Of the five researchers I was able to access and conduct interviews with Barbara Braden, Hitomi Sanada and Takehiko Ohura.

The Norton Scale (Appendix D) was created in England in 1962. It was the first pressure ulcer risk assessment tool ever developed. But it is now criticized by Bergstrom and Braden in the wake of the results of evidence-based research of their own scale, i.e., the Braden Scale. As such, the

Braden Scale was developed to overcome the technical inappropriateness of the Norton Scale. The Braden Scale compared favorably with the Norton Scale with respect to sensitivity. The specificity, or the tendency of a scale to over-predict, was greater for the Norton Scale than for the Braden Scale (Bergstrom 1987). On the other hand, the first Japanese academic paper on pressure-ulcer risk assessment was written by Sanada, who introduced the Braden scale (Sanada 1995). The Braden Scale (Appendix E) is a summated rating scale made up of six subscales scored from 1-3 or 4, for total scores that range from 6-23 (Braden 1989). The evaluation is based on six indicators: sensory perception, moisture, activity, mobility, nutrition, and friction or shear.

In the interview Dr. Braden stated, "We are very open to overseas users of the Braden Scale and everyone is welcome to translate our work under our permission". On the other hand Dr. Sanada said, "There used to be no tool like the Braden Scale in Japan. After having discussion with Dr. Braden and assuring its validity, I decided to translate it into Japanese and use it".

Then, under the financial sponsorship of the Ministry of Health, Labor and Welfare (MHLW), the team led by Sanada developed the "Kanazawa University Scale for Pressure Ulcer" or "K-scale" (Appendix F) in 1998 by integrating the measurement scales that quantified severity of morbid bony prominence which was unique to Japanese patients with pressure ulcers (Sanada 1998). Thus, Sanada created the new scale by incorporating characteristics of Japanese patients. Following these improvements, a team led by Ohura and Hotta developed the "OH Scale" (Appendix G) in 2002 which was also financed by the MHLW. According to the two researchers, the isolation of risk factors based on validity and user friendliness constitute the main differentiation compared with the preceding scales.

Consequently, It is suggested that a technological transfer pathway has existed amongst the United Kingdom (UK), United States of America (USA) and Japan for over a half century. In this pathway, such operant resources as technological knowledge and its application have been inherited. More precisely, as indicated in Fig. 7-3, the pressure ulcer risk assessment tool originated with the Norton Scale (1962) in the UK, then was improved significantly by Braden as the Braden Scale (1986) in the USA. The Braden Scale was then translated and imported to Japan in 1987 by Sanada. Based on these precedents and newly discovered findings, Oura and Hotta developed their tool, the "OH Scale".
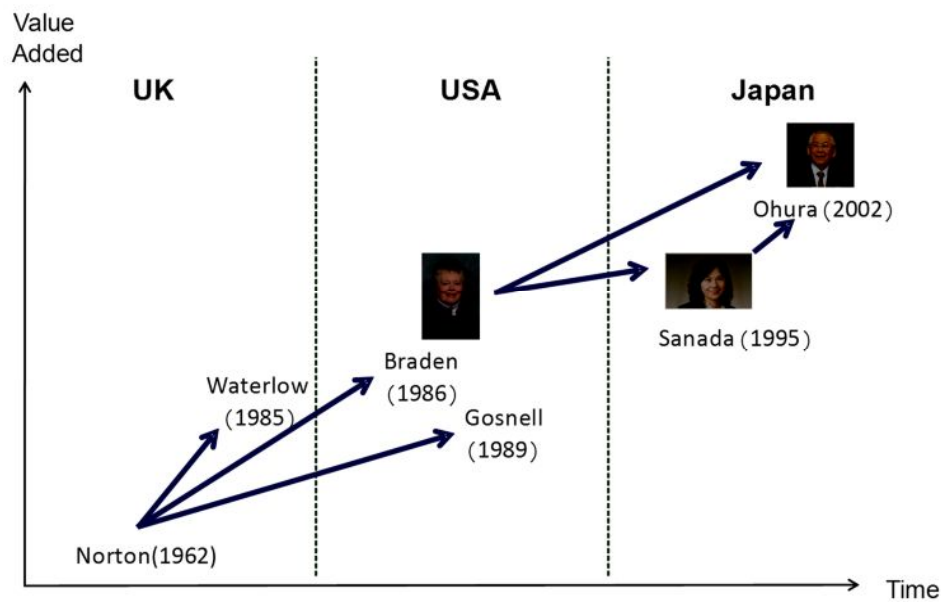
Figure 7-3: Key Researchers on Technology Trajectory

Furthermore, prior to the widespread diffusion of such a scale in Japan, the key researchers described above have played roles as improvers, technological transmitters and translators in the technological trajectory of these tools across the three countries. The incremental improvements can be observed in (1) isolation of independent measurement factors, (2) movement from relative and subjective measurement to absolute and objective measurement, (3) utilization of evidence, and (4) user-ability or user friendliness of the tool. Each scale is expressed as a matrix in a paper with a copyright, and proprietary intellectual rights such as patents have not been attached to these scales by the developers.

As far as the practices of the Patent Act of Japan are concerned, physical artifact products, including pharmaceutical and medical devices and the related manufacturing methodologies can be patented. But soft and intangible methodologies of operation, therapy and diagnosis to be performed on human beings have not been patented (Watanabe 2009). Therefore, pressure ulcer risk assessment tools have not been patented in Japan.

7.3.2 Policy-interventional translational research cycle

Let us look at the complex phenomena involving pressure ulcer risk assessment tools from the perspective of translational research. As mentioned earlier, the major Japanese studies focusing on the development of pressure ulcer risk assessment tools have been financed by the MHLW. In turn the

MHLW was able to integrate the major findings and data from the research into the policy formulation processes. In this context, Sanada states, "the close-knit collaboration between the researchers at universities and the MHLW contributed significantly to enhancing translational research". The bench side of the continuum represented by key researchers in academia co-created value in the form of improved pressure ulcer risk assessment tools with the MHLW. In other words, the development of pressure ulcer risk assessment tools, which can improve the quality of health and nursing services delivered for pressure ulcers, is the output of the academia-government-hospital complex, not to say confederacy behind the scene.

Based on the accumulated knowledge of their predecessors in the UK and the USA, the pressure ulcer risk assessment tool primarily improved by Sanada and further refined by Ohura and Hotta became *de jure* standard of risk assessment practices of pressure ulcers at the bedside under the Japanese scheme of public medical reimbursement scheme. Note that "the OH Scale" was included in the attachment of the Japanese public medical reimbursement scheme. The pressure ulcer risk assessment tool was included in this scheme as an attachment of the penalty or negative schedule against rule breakers. Consequently, the pressure ulcer risk assessment tool was institutionalized in the national public medical reimbursement scheme. Thus, the technological efficacy of the tool alone was not all that contributed to the increased use of pressure ulcer risk assessment tools in Japan. The inclusion of the pressure ulcer risk assessment tools by public medical reimbursement schemes was the most significant factor. The utilization of pressure ulcer risk assessment tools became a compulsory intervention in all Japanese hospitals in 2002 (Matsushita 2010). In this regard, the way the use of the risk assessment tool was "translated" into public impact was unique. That is, in the penalty scheme there was a disincentive for reimbursement when a governmental audit office discovered that a certain hospital did not operate the required team-based approach to prevent and care for pressure ulcers in accordance with the newly created regulation codes. Consequently, all hospitals had to use such a tool in order to safeguard themselves from penalties rather than to appropriately assess the risk of pressure ulcers (Matsushita 2010). In other words, the legislative regulation on bed-side utilization of ulcer risk assessment tools under the national medical reimbursement scheme was, and most always has been, the output of the functions of the policy-interventional translational research cycle embedded in the academia-government-hospital complex.

7.3.3 Product-centric translational research cycle

Another translational feature, namely, a product-centric translational research cycle, can be observed amongst the university, hospital and industrial sectors. While the translational research embedded in the academia-government-hospital complex puts emphasis on developing and institutionalizing the human service aspect of the new therapy, i.e., pressure ulcer risk assessment tools, this translational research cycle has been playing a central role in co-developing the product aspects of the emerging therapeutic method.

The pressure ulcer risk assessment tool has disseminated the operant idea that the key in preventing pressure ulcers is to lower the interface pressure. For example, Sanada has been engaged in co-developing medical devices to measure and lower the interface pressure with the industrial sector. She developed the interface pressure measurement devices named "Celo" and "Perm Q", i.e., portable interface pressure sensors with CAPE CO, LTD. in 2004 (Sanada 2009). Later, the laboratory under her supervision developed the air mattresses named "TriCell" and "Big Cell-Ex" in cooperation with CAPE CO, LTD. "TriCell" was developed primarily for low to medium risk patients and is equipped with two different types of layers. The upper layer dissipates interface pressure, and the lower layer provides stability and prevents bottoming. "Big Cell-Ex" was developed for high risk patients typically with tabescence and contracture. The built-in microprocessor in the pump unit calculates and maintains air pressure of each cell of the air mattress at the required level in accordance with patient physical condition (Sanada 2009).

Ohura was proactive in applying his expertise regarding pressure ulcer risk management to the development of therapeutic dressing products in alliance with modern dressing manufacturers in the industrial sector. Ohura, together with KAIGEN CO., LTD., developed the specially designed polyethylene gel dressing sheet for pressure ulcers. He also utilized polyurethane film with holes as an alternative dressing material in providing moist wound therapy (Ohura 2009). Thus, the product-centric translational research cycle has brought about product innovation primarily in the field of moist wound therapy. The knowledge empowering the invention of technological devices is derived from the body of operant scientific knowledge accumulated in the process of developing the pressure ulcer risk assessment technologies primarily explored and validated in the aforesaid policy-interventional translational research cycle. The more the new therapeutic method in which the currently developed medical devices play significant roles became diffused, the more frequently the pressure ulcer risk assessment tools became utilized in various clinical settings.

7.3.4 Grass roots promotional activities

Another underlying factor contributing to that diffusion is the communicative activities primarily performed by Enterostomal Therapy and Wound Ostomy Continence (ET/WOC) nurses, of which a nationwide qualification program was launched in 1996 in Japan. The human resources development system for a WOC nurse, referred to previously as an "ET" (Enterostomal Therapy) nurse, is created in order to educate specialists for dealing with problems involving pressure ulcers and ostomies. The number of WOC nurses, the nursing personnel who are primarily responsible for caring for wounds and pressure ulcers, has been increasing sharply as shown in Fig. 7-4.
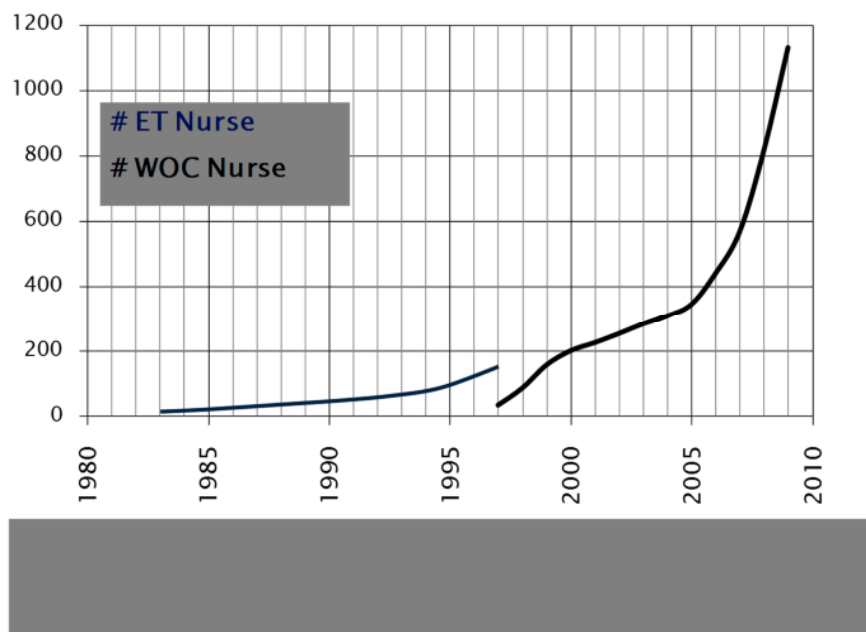
Figure 7-4: Accumulated Numbers of ET/WOC Nurses

From empirical studies, interactions with lead users in instrumentation (von Hippel 1988) and with experimental users in a niche market (Malerba et al. 2007) bring about the creation of new knowledge and innovative solutions. WOC nurses have been functioning, by and large, as facilitators of moist wound healing methodology (Ushiyama 2010). Given that risk assessment tools for the treatment of pressure ulcers comprise a crucial part of such a therapy method, WOC nurses have played salient roles as clinical lead users in diffusing not only risk assessment tools for the treatment of pressure ulcers, but also such products as air mattress, alternative dressing materials, and medical devices in healthcare institutions. In other words, they have facilitated the communication processes to stimulate users' willingness and ability to utilize the alternative therapy encompassing both product and service aspects of the emerging solution.

The inclusion of pressure ulcer risk assessment tools by public medical reimbursement scheme can be expressed as a top-down approach, whereas grass roots promotional activities performed by ET/WOC nurses can be described as a bottom-up approach. "Without the activities carried out by ET/WOC nurses", said Ohura, "the moist wound healing methodology and risk assessment tool of pressure ulcer would have never been spread out so thoroughly in Japan".

7.4 Translational activities seen from the lens of T1, T2, T3 and T4

The features and mechanism of university-industry-government relations have attracted research interests (Etzkowitz and Leydesdorff 1995, 1997; Fujigaki and Leydesdorff 2000). This case posits

some features related with institution, interaction, communication involved in translational systems involving university, hospital, and government relations. In T1 or translation to human phase, the US researchers and practitioners worked closely in their community of practice and identified major risk for pressure ulcer and developed the risk assessment tool such as Braden scale partly based on the proceeding tool in UK.

T2 or translation to patient phase started from personal contact in an informal setting. The Japanese researchers in universities in close-nit personal relation with the US counterpart transferred clinical and scientific knowledge on the risk assessment tool and added improvement based on their localized clinical outcomes. By the efforts of researchers in the overlapping interests in therapy of pressure ulcer in both countries, *translation* emerged at least in terms of (a) clinical system application; from the American clinical environment to the Japanese counterpart, (b) language; from English to Japanese, (c) community of practice; from the US to the Japanese, (d) technological trajectory; from UK-USA to Japan, (e) academia; from the US university to Japanese universities and (f) healthcare reimbursement system; the US health insurance scheme constructed on market mechanism to the Japanese social healthcare reimbursement system based on reciprocal relations.

Form the T3 or translation to practice phase, the Japanese trajectory has been influenced by its own features of university-industry-government relations. One of the peculiarities is that the development of Japanese version of risk assessment tool was financially supported by the government. Thus the Japanese government, interested in preventing pressure ulcer, became positioned to assess the clinical data and apply those to policy formation.

The T4 or to translation to Japanese population has been done through aforesaid national scheme of reimbursement system for health services. By this policy changes all the 9,800 hospitals nationwide had to organize pressure ulcer assessment committee with legitimate due processes and reporting formats. Thus risk assessment tool diffused throughout Japan. Such government-led initiative has caused systemic changes in hospital administration nationwide. Consequently, the two translational cycles were manifested; those were, (1) policy centric translational cycle among university, hospital and government, and (2) product-centric translational cycle among university, hospital and firm.

7.5 Dynamism of dual translational cycles

Behind the innovation and diffusion of the novel services brought by pressure ulcer risk assessment tools in Japan, there was a set of underlying factors involving 1) international technological transfer with incremental improvements, 2) a policy-interventional translational research cycle embedded in the academia-government-hospital complex, 3) a product-centric translational research cycle embedded in the academia-government-hospital complex, and 4) grass roots promotional and communication activities performed by Enterostomal Therapy and Wound Ostomy Continence Nurses.

The diffusion of service innovation depended on, and was derived from the co-evolutionary relationships amongst a number of complex agents:

- Key researchers who derived the policy-interventional translational research cycle, primarily by bridging hospitals, universities and government.

- Key researchers who derived the product-centric translational research cycle, primarily by bridging hospitals, universities and firms.

- Hospitals that communicated with firms in commercial transactions, facilitate translational cycles and operate under the policy schemes set by government.

- Clinical specialists and lead user groups with specific professional training and expertise.

- Government that implicitly played roles by financing research, accessing data, and controlling healthcare deliverers through policy formation and regulation.

- Firms that had competencies in exploring the research and development opportunities mainly in the product-centric translational research cycle by keeping abreast with the policy-interventional translational research cycle.

- Professional communities that defined the degree of clinical impact of the innovation itself.

- Patients who found such a therapeutic method safe and effective.

Here we are able to draw some suggestions from this study. First, a systematic review of the set of underlying factors reveals that behind the aforesaid factors and agents, there exists the complex and co-evolutionary relationships of diversified agents, as indicated in Figure 7-5.
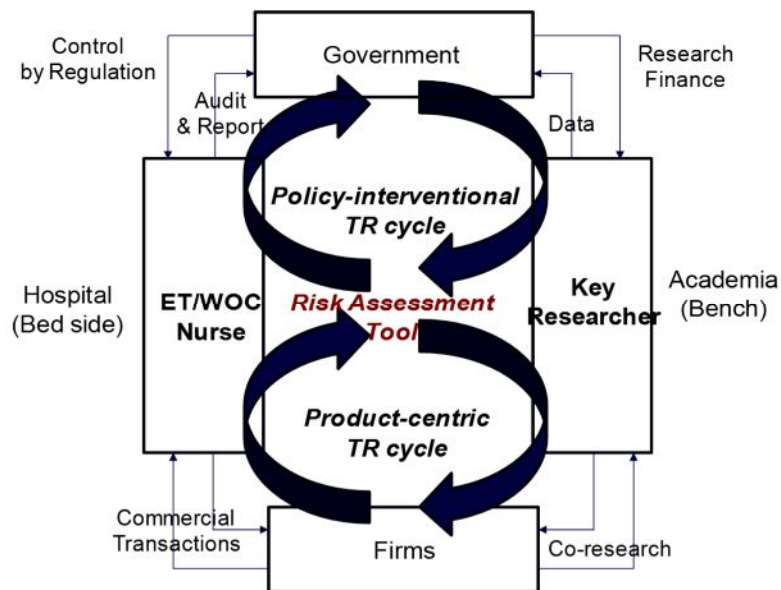
Figure 7-5: Policy-centric Translational Cycle and Product-centric Translational Cycle

In policy-interventional translational research, an emphasis is largely put on the service aspect of clinical procedures. Soft resources rather than hard resources tend to be extensively utilized here in an open manner. The agents involved tend to not be so much concerned with asserting proprietary rights of novel services or tools that can improve the service quality. Thus, the service aspect of clinical procedures, when they are not precisely embedded in products, is perceived as public goods rather than private goods with exclusive proprietary rights.

On the other hand, the product-centric translational research cycle is geared towards developing, trying, evaluating, discovering and improving product aspects of invention and innovation. As such, firms have to invest substantial amounts of money and energy in their productive activities utilizing tangible and hard resources. Firms, in alliance with hospitals and universities, are required to perform the key transactional roles in developing, manufacturing, marketing and distributing their products to hospitals mainly, if not solely, based on the motive of profit maximization. The firms are therefore inclined to use intellectual property strategies to ensure optimal return of investment and market competitiveness. In that sense, traditional product-centric firms have an inclination to develop their crucial intellectual properties in an exclusive manner. In this cycle, however, the government plays a role in controlling the commercial go-to-market activities on the part of firms by evaluating and regulating the efficacy and safety of products.

Firstly in conclusion, the policy-interventional translational research cycle and its product-centric counterpart do not function separately. Rather, these two cycles are co-existent and co-

evolutionary in developing, testing, evaluating, discovering and improving the solutions to healthcare issues composed of service and product aspects. Hence, the innovation and diffusion process of pressure ulcer risk assessment tools runs parallel with the co-evolutionary process of the policy-interventional translational research cycle across universities, government, and hospitals and the product-centric translational research cycle bridging industry, universities and hospitals. In this regard, key researchers play critical roles as agents of such co-evolution, and ET/WOC nurses' act as clinical lead users in diffusing solutions composed of a service-product mix. Along with such co-evolutionary processes health service innovations based on pressure ulcer risk assessment tools have been developed and disseminated. As such, processes involving a variety of agents co-evolve, and health service innovations utilizing pressure ulcer risk assessment tools prevail and become imperative.

Secondly, this work suggests that when one intends to manage innovation of a novel therapeutic method, what really has to be managed goes beyond entities such as hospitals, firms, physicians, nurses, specialist groups, products and clinical procedures. The co-evolutionary relation amongst a number of complex agents is the pivotal orientation that could facilitate, or might hinder such service innovation processes. The pivotal orientation *per se* should be managed effectively and minor components should be so managed in accordance with such pivotal orientation to enhance innovation and diffusion.

Thirdly, the case provides us with an example of a service innovation process in which various agents have had abundant opportunities to utilize, translate, customize and further improve the scales based on their needs, provided they abide by the copyrights attached. The fact that patents are not awarded to pressure ulcer risk assessment tools in a manner that a certain patentee is able to secure monetary value exclusively has ensured that heterogeneous agents, namely patients, nurses, physicians, researchers, firms and policy makers could utilize such tools and could be involved in the co-evolution processes. If such intellectual property rights as patents had been established by some agent based on monetary profit-seeking incentives, the technological trajectory would have been completely different, and the phenomena described above would have come into reality in a different way.

Chapter 8: Discussion

Based on the outcomes and implications obtained by the researches hitherto this chapter will discuss the translational features of healthcare services by specifically focusing on the dynamics related with competency, context, knowledge generation and innovation in services. This chapter hence is a trial to answer the meta research question raised at the threshold of this thesis; that is, what factor characterizes the process of translational value co-creation in health services, and how?

The human competency is transferred into and applied to human activity contexts by way of interacting through shared context-in-motion before any knowledge or value is created. Knowledge or value is inter-subjectively perceived by involved agents in shared context-in-motion. To effectively explain this feature, in this chapter, a helical model of translational co-evolution of knowledge will be proposed in an attempt to generalize the process of knowledge creation, which forms a cognitive premise of invention and innovation of healthcare services. Given that diversified healthcare systems are emerging rapidly and the degree of complexity is increasing these days, the disciplines the health services professionals including physicians and nurses refer are changing. Also the practices of healthcare professionals are becoming more complex than ever. These circumstances by and large tend to make value co-creation in health services more complex not only for service recipient but also provider. Therefore the triad translational continuum model will be proposed to explain how an agents adapt themselves to and interact with disciplines, practices and systems.

As shown in the following table, value co-creation emerges at shared context-in-motion in micro, meso and macro levels by involving various relations, agents and triggers. Innovation in service systems occurs when three levels are effectively bridged or translated.

	Micro	Meso	Macro
Relation	Beneficiary-provider	Professional and users group	Health services industry-university-government
Agent	Patient, physician and nurse, etc.	Professional group and interest group	Firm, university and government
Trigger for innovation	Adaptation to local practice	Adaptation to professional standard	Adaptation to Policy
Impact	Bed side	Practice at large	Population

Innovation of health services emerges when major changes are effectively translated in multiple numbers of layers. Innovators intervene in contexts and spiral up those from contextualization to trans-contextualization through re-contextualization, de-contextualization and co-contextualization. Accordingly shared context-in-motion is shaped and recognized as such by the agents concerned. While contextual translation at shared context-in-motion brings about "knowledge creation (Nonaka 1990)", it should be necessary to discern the features of contextual intervention on the part of agents.

Innovators are good at translating three types of knowledge, i.e., techne, phronesis, episteme. Shared context-in-motion plays an important role in system praxis. Recursive and circulative movement could expand translational continuum of disciplines and/or practices. Then grounded on those discussion, descriptive analysis will be given to the style of leadership that can facilitate translational activities in healthcare field. These translational viewpoints hopefully provide us with some new perspectives in addressing invention and innovation of healthcare services involving heterogeneous agents as well as agents.

8.1 Translation of human competency into context

The concept of shared context-in-motion was discussed in light of phenomena of value co-creation in Chapter 4 and a model of meta value-in-context transformation was then proposed to empirically explain the process of emergence of value-in-context. Here let us discuss the issue again from a perspective of translational thinking.

As shown in Figure 8-1, throughout the processes of health services in forefronts the agents including patient and a team of caregivers *translate* their competencies into value by way of interacting through shared context-in-motion. Therefore value co-creation can be expressed as the process of mutual *translation* of agents' competencies into value-in-context at shared context-in-motion. Put differently various agents including even recipient accommodate their competencies in shared context-in-motion to capture value.
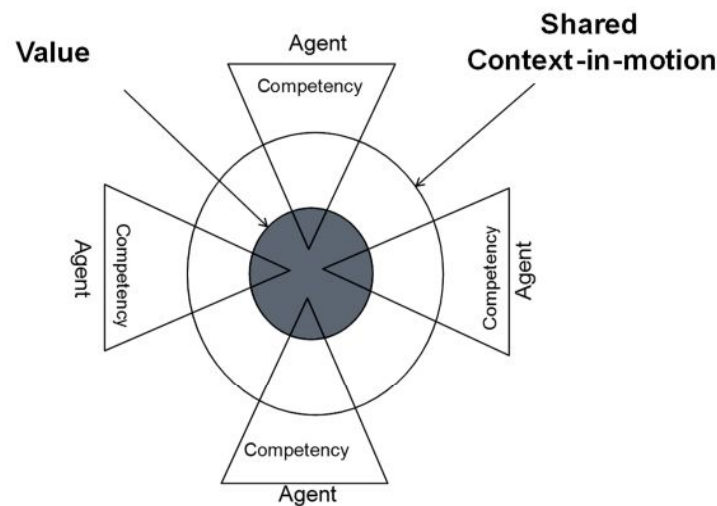
Figure 8-1: Translation of competency into value co-creation

High performing agents continuously improve relational quality (Gronroos 2007) by being highly attentive, empathetic, careful and resonant in sharing caring experiences in various relations with patients and other actors. This tendency is evidenced by the research included in Chapter 4 and more precisely by Appendix C; the full coded text of narratives that the outstanding nurses shows high profile in such competencies as Interpersonal Understanding (IU) and Relationship Building (RB). Therefore it should be noted that the behavior of high performing nurses tend to be based on positive attitudes and emotions when they exhibit such competencies as Interpersonal Understanding (IU) and Relationship Building (RB). Consequently value co-creation can be expressed as the process of mutual *translation* of agents' holistic elements including knowledge, skill, attitude and emotion into value-in-context at shared context-in-motion, which in turn is inter-subjectively translated by patients (service recipients) and caregivers (service providers).

Shared context-in-motion is a mental place where agents intentionally or unintentionally seek 'requisite variety' (Ashby 1956)[7] where they attempt to conquer or destroy variety in an environment by accommodating various competencies and contexts together. A shared context-in-motion is therefore an incubation apparatus of creative ideas in which agents translate their competencies into value-in-context. A shared context-in-motion also absorbs abundant contexts from the continuum of practices and disciplines by way of involving concerned agents and create now ideas. When it is combined with 'systems' it can be institutionalized into a project team, cross-functional task force and start-ups.

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[7]Ashby, W.R. (1956). An Introduction to Cybernetics. Chapman & Hall.

8.2 On knowledge and shared context-in-motion

8.2.1 Dynamics of shared context-in-motion

Agents drift shared context-in-motion in interaction with other actors. The dynamics of shared context-in-motion can be explained by the two distinct elements, i.e., the feature of context and the action of agents involved in it as shown in Figure 8-2. Context-active actors (usually high performers) participate in a new context by taking part in new relationships with other actors and they make their own context (*contextualization*). They interpret, perceive and experiment with the newly encountered context through their lenses (*re-contextualization*). Then they share and instantaneously synchronize the new context with other actors (*co-contextualization*). In other words this process is socialization. Then they objectify the context as a separated object by modeling what they experienced in their practices (*de-contextualization*). Put simply this is an implicit process of deconstruction (Derrida 1967) in that an agent subjectively picks up some elements out of the exposed context by deconstructing it and attempts to make something useful. They are even inclined to abstract their experiences and practices in an attempt to construct concept and logic out of context. Then they convey, transfer, bridge and translate the contexts with others and co-create new context that did not exist previously (*trans-contextualization*). Consequently convex combinations of ideas occur through trans-contextualization after ideas are filtered through contextualization, re-contextualization, co-contextualization and de-contextualization. The dynamics of shared context-in-motion provide involved agents with the purposeful opportunities by that they are able to share the fertilization of knowledge embedded in the shared contexts. Thus for community of practice, discussed in Chapter 3 and 5, to be productive in knowledge generation, the dynamics of shared context-in-motion should be immanent in it.
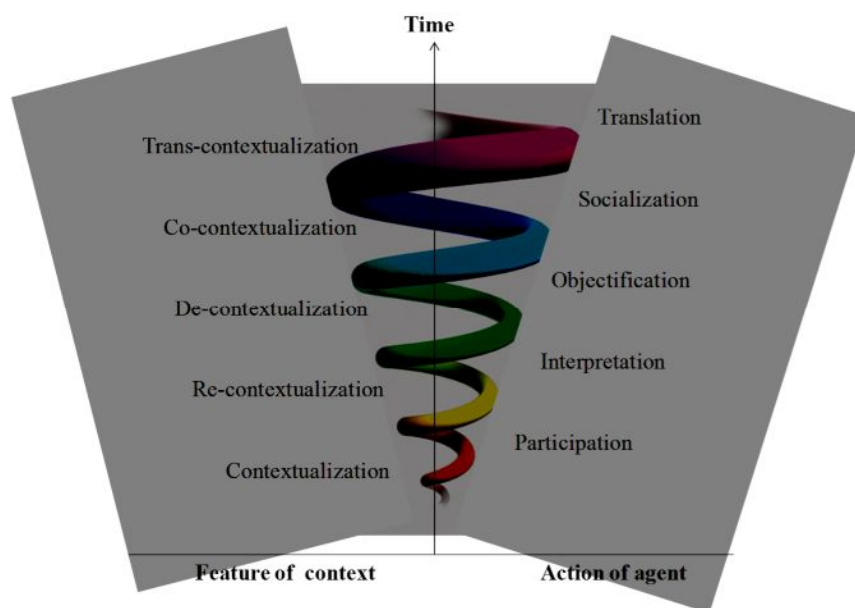
Figure 8-2: Dynamics of shared-context-in motion

8.2.2 Helical model of translational co-evolution of knowledge

As has been discussed hitherto, particularly around high performing agents there phenomenologically exist the dynamics of shared context-in-motion. Here let us configure a three dimensional helical model of translational evolution of knowledge by assuming three types of knowledge; those are techne, episteme and phronesis.

Techne is said to be a term derived from the Greek word, translatable to "craftsmanship", "craft", or "art". Deriving from techne, an English adjective "technic" represents three meaning: pertaining to art, or an art; skillfully made or constructed; and the science or study of art or arts especially of the mechanical or industrial arts[8]. Although techne is developed in relation with context involving necessity and resources, it is positioned apart from concreteness of context. But the usage of techne is done through the application to context. The word "technology" stems from techne; that is concrete, variable and context-dependent. According to Young (2009) techne is mainly operative in the domestic sphere, in farming and slavery, and not in the free realm of the Greek polis. The knowledge on craft and manufacturing artifacts is classified into a techne. Techne (know how) is regarded to be useful when it is practically applied to a context.

Episteme is etymologically rooted in the Ancient Greek word for knowledge or science, which comes from the verb that means 'to know'. Episteme is scientific knowledge and a system of understanding[9]. In Plato's discourse episteme means knowledge, as in "justified true belief". Foucault (1980) defined "the episteme retrospectively as the strategic apparatus which permits of separating out from among all the statements which are possible those that will be acceptable within, I won't say a scientific theory, but a field of scientificity, and which it is possible to say are true or false. The episteme is the 'apparatus' which makes possible the separation, not of the true from the false, but of what may from what may not be characterized as scientific" Therefore episteme is independent from context, or it is obtained by de-contextualization. As is well known the term 'epistemology' was introduced by the Scottish philosopher James Ferrier. Epistemology is the theory or science of the method or grounds of knowledge in answering the general question, 'What is knowing and the known?' or more shortly 'What is knowledge?'[10]

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[8] Simpson. J and Weiner. E., The Oxford English Dictionary. Second Edition. Volume XVII. Clarendon Press Oxford. 1989. p702-703.

[9] Simpson. J and Weiner. E., The Oxford English Dictionary. Second Edition. Volume V. Clarendon Press Oxford. 1989. p338.

[10] Simpson. J and Weiner. E., The Oxford English Dictionary. Second Edition. Volume V. Clarendon Press Oxford. 1989. p338.
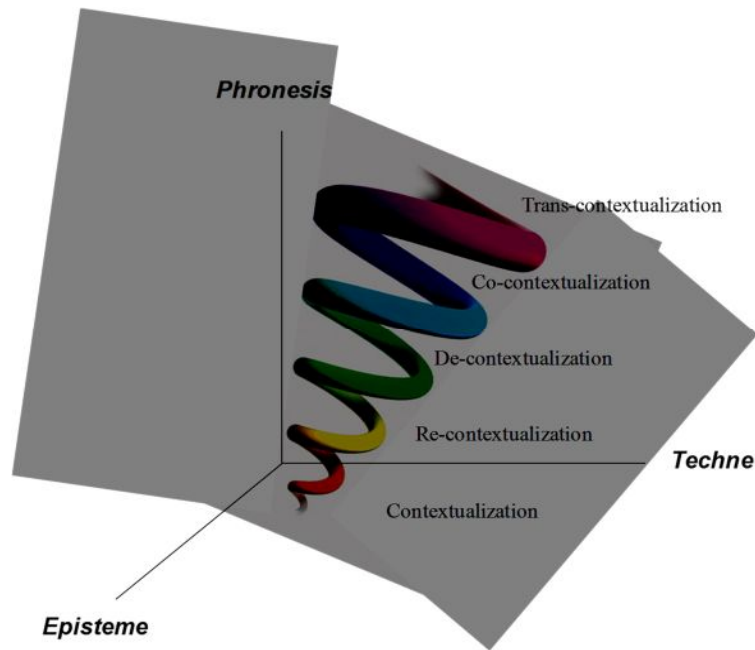
Figure 8-3: Translational evolution of knowledge

Phronesis is a Greek word which means thinking, understanding, intelligence, perception, practical sense and practical judgment[11]. As opposed to episteme and techne, it means intelligence, the virtue of practical thought, practical wisdom and prudence. Aristotle states that phronesis is not simply a skill (techne), however, as it involves not only the ability to decide how to achieve a certain end, but also the ability to reflect upon and determine good ends consistent with the aim of living well overall[12]. Phronesis therefore is deeply concerned with particularity of contexts, as such phronesis is concerned with concreteness regarding when, whom and where to act in a particular context.

A high performing agent in any field tends to hold certain balanced levels of techne (know how), episteme (know what and why) and phronesis (know when, whom and where) in accordance with his or her own engagement, occupation and role. But at the same time as is shown in Figure 7-3, those outstanding individuals are capable of *translationaly* mobilizing techne, episteme and phronesis and thus utilize those by committing and drifting shared context-in-motion with others. In other words high caliber team of people forms cycle of translational co-evolution of knowledge around them. It should be noted that such a cycle runs parallel with action research cycle discussed in chapter 4 and 5.

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[11] Simpson. J and Weiner. E., The Oxford English Dictionary. Second Edition. Volume XI. Clarendon Press Oxford. 1989. p735.

[12] Book 6 of the Nicomachean Ethics, Aristotle

In shared context-in-motion, the agents, in relation with other actors or thinghood, exhibit dynamic action and contextual transformation such as participation (*contextualization*), interpretation (*re-contextualization*), socialization (*co-contextualization*), objectification (*de-contextualization*) and translation (*trans-contextualization*). Consequently as is shown in Figure 8-3, knowledge spirals up dynamically by drifting among such spheres as techne, episteme and phronesis when shared context-in-motion is active. This process explains the formation of internal model among concerned agents, where, in other words internal model is co-defined by the agents involved.

8.3 On invention and innovation from a translational viewpoint

8.3.1 Service innovation by cross-institutional translational resonance

Invention does not necessarily lead to innovation. Innovation with societal impact is emergent only when the complex societal systems have been resonant enough to diffuse what was invented. In order for invention to transform itself into innovation, another type of translational process is necessary; that is cross-institutional translational resonance that results in impact on the population.

As was described in chapter 7, the risk assessment tool had been diffused by the resonance of three sectors, i.e., university, government and health industry including hospitals. These sectors, however, behave differently since they are heterogeneous in terms of goal, administrative function, learning style and culture as well. Businesses in industry aims at realizing sustainable growth while ensuring maximization the value perceived by customer and profit shared by investors. Government, if it is operated on sound liberal democracy principle and is free from corruption, is expected to be primarily responsible for policy formation and implementation while seeking social equity and fair distribution of wealth among taxpayers. On the other hand university is required to carry out state-of-the-art research and train their students and researchers. Hospital representing health industry expect to deliver safe and efficient health services to the targeted population while such institution as university hospital is involved in the phases of translational researches.

The value co-creation with the systemic resonance among the sectors which accommodate various shared context-in-motion has shown a salient aspect of innovation. The facts and figures analyzed in Chapter 6 could be recognized that the key researchers in relations with other concerned agents *translated* the shared context-in-motion itself from a limited local level to a national level which encompasses the three sectors, i.e., university, government and industry. Here the helical translational evolution of knowledge was spiraled up from such T1 level as human, to levels involving patient (T2), practice (T3) to population (T4) by generating systemic resonance amongst the concerned institutions, which had resulted in the emergence of the converged contexts of industry, university and government as is illustrated in Figure 8-6.

T4: Translation to Populations

T3: Translation to Practice

T2: Translation to Patients

T1: Translation to Humans

● Contextual node

Industry University Government
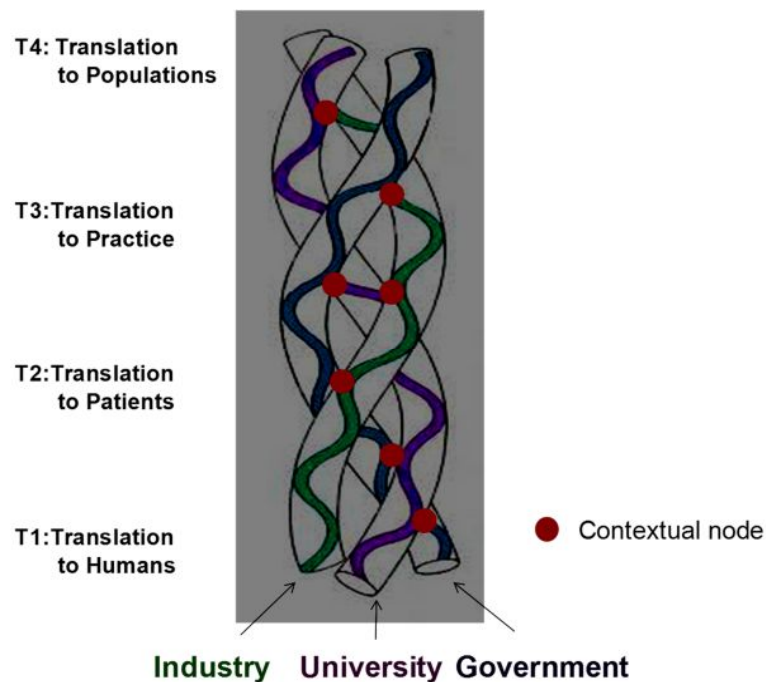
Figure 8-4: Converged translational contexts among industry, university and government

Network theories largely tend to emphasize the importance of creating and managing nodes to generate sustainable network systems. To complement it from the standpoint of dynamics of knowledge creation, however, shared context-in-motion is another name of node. As is shown in Figure 8-6, shared context-in-motion involving the key agents representing each sector induces different contexts to be resonant and converged like a magnet, which results in the formation of nodes in each of the phases raging from T1 to T4 in translational research activities. In government organization and in governmental processes there are a number of visible and invisible red tapes, so are the cases with many of the established companies and universities as well. In such cases corrupt context-in-demotion rather than shared context-in-motion would be emergent, should appropriate countermeasures not be taken.

8.3.2 Translation between physical artifacts and non-physical services

Recently innovation of on-the-edge physical artifacts has been expected in such fields as regenerative medicine utilizing Induced Pluripotent Stem cell (iPS), molecular target drug, pharmacogenomics, positron emission tomography, magnetic resonance imaging, molecular imaging devices for medication of malignant tumor, drug delivery system, and surgical robot to name only a few. The physical artifact inventions, however, have to go through such translational research and development activities as T1; translation to human, T2; translation to patient, T3; translation to practice and T4; translation to population before those are disseminated in society. At the same time in order for these inventions to be accepted as innovation by society, appropriate soft methodologies to utilize, apply

and regulate those novel physical artifacts to each of the standardized clinical contexts are required. Health services are realized not only by physical artifacts but also by very intangible services to relate, use and regulate those products regardless of whether they are novel or not.

Recently the translational researches the world over tend to focus on the research and development of novel physical artifacts including drugs, devices and biological products, partly because novel physical artifacts are regarded to posit direct positive impact on the welfare of the population, and partly because innovative physical products, when they are protected by intellectual property rights, will generate economic value for the stakeholders like investors, investors-supported entrepreneurial researchers, and technology transfer officers, etc. But the translational relations between novel products and services in the aforesaid context will be salient because the services encompassing appropriate usage, application and regulation of products ensures quality, safety and ultimately value to be co-created. As such translation between physical artifacts and non-physical services is imperatively important not only for patients but for health industry, university and government.

8.3.3 Service innovation by translational resonance in hierarchy

Roger (2003) emphasizes the importance of social system as a factor of diffusion process. Note that viewing social system in hierarchical lens provides us with more realistic comprehension about diffusion of novel healthcare services. Innovation in health service manifests itself by the translational resonance across the hierarchy of healthcare services. As was discussed in Chapter 6, health services by and large consist of five layers including healthcare base (or infrastructure, social capital and social security), platform, health services deliverers, interaction (or physical artifact, human service and knowledge) and patient. The case study on innovation of therapy of pressure ulcer shows:

- *Type1*: Resonance between patient, interaction and health services institutions. The risk assessment tool of pressure ulcer changes drastically not only the interventional method employed by a care team in each institution, i.e., hospital, clinic, welfare facility and home care, but also the physical artifacts including mattress and dressing materials, and the decision making to be managed throughout the cure and care processes.

- *Type 2*: Resonance between healthcare base, platform and health services institutions. When government institutionalized reduction to the non-provision for pressure ulcer in its national healthcare reimbursement systems in healthcare base layer, all of the healthcare deliverers in Japan had to follow the guideline, which in fact has diffused that therapeutic method to the population.

- *Type 3*: Resonance between platform and health services institution. In platform layer such academic society as Japanese Society of Pressure Ulcer was initiated. Also electric medical recording systems had begun to deploy newly introduced therapeutic method.
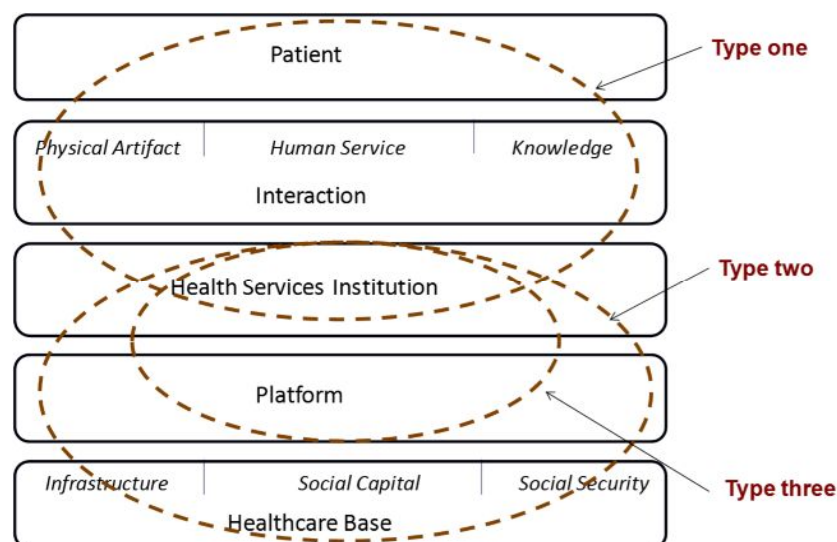
Figure 8-5: Service innovation by translational resonance in hierarchy

As indicated in Figure 8-7, service innovation emerges when multiple of layers of health services manifest translational resonance in hierarchy. Thus systemic changes are realized to reset the behaviors of all agents, the utilization of thinghood and the relations thereof involved in each of the layers. Consequently a systemic change is emergent when an innovation has prevailed in a certain domain.

8.3.4 Transformation of forefronts of healthcare services

Due to the ever increasing aged populations in the human history and Japanese history in particular, the layer of health services institution is under a historical transition. The health services systems belong to this layer are shifting from (a) cure basis to care basis, as well as (b) centralized systems to decentralized systems as shown figure 8-8. Those set of transition have been facilitated by the initiatives by government and the corresponding sectors including traditional hospital at cure/centralized sector (left below). Also construction firms and financial sector including real estate investment trust are becoming aggressive in penetrating into centralized/care sector (right below). Since the needs of the elderly people to stay in their own homes has been tenacious, the needs for the

decentralized/care have been unmet. As a result numerous systems have been legitimatized and emerged (right up).
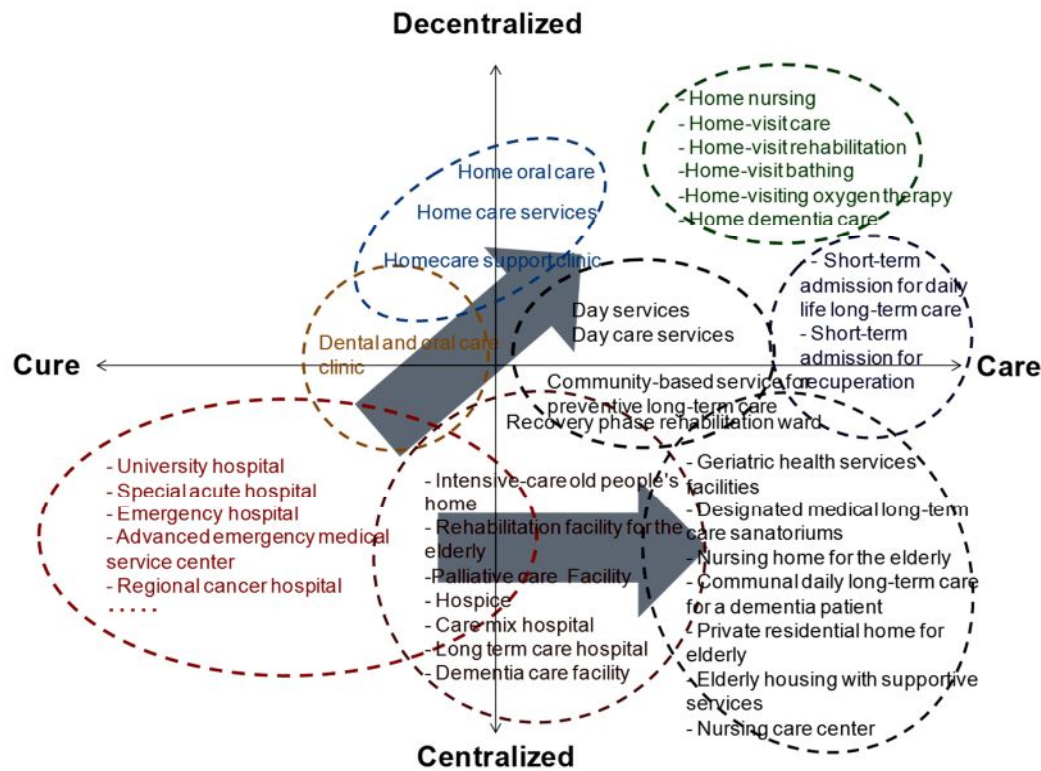
Figure 8-6: Changes of forefronts of healthcare services

The transformation of forefronts of healthcare services as such can be classified into the *type three* in the previous section while lacking sound foundation of platforms in that the transformation has been initiated by the government, and the *type one* in that alternative therapeutic methods in interaction layer such as home-visit rehabilitation, home-visit oxygen therapy and home-visit bathing to name just a few, have been introduced and practiced at the service forefronts.

 Since the alternatively emerging healthcare systems as shown in Figure 8-8 have been urgently legitimatized, they have still remained fragmented without a platform system that ensures consistent continuity of care provision especially from a standpoint of customer and patient. The concept of 'care cycle' (Hasegawa 2012, 2013) will be of help in order to reframe the issue from the customers' viewpoint. A series of epidemiological studies conducted by Hasegawa revealed that in care cycle old patients (age> 75) with multiple numbers of chronic diseases including 'five big killers', namely cancer, stroke, acute myocardial infarction, diabetes and mental disorder tended to cycle between

cure/centralized facility, care/centralized facility and care/decentralized systems before his or her death (Hasegawa 2013). Nevertheless the medical records and clinical pathways are not effectively shared by the concerned parties. As such continuity of care tends to be alienated and the unnecessary duplications of physical checkups and laboratory examinations occur. Such a discontinuity of health services hinders quality of care, and at the same time increases healthcare costs.

The translational healthcare services that effectively and efficiently link the diversified systems are required by deploying such platform as electric medical record and clinical pathways for the major diseases for the elderly patients. The introduction of such systems will enhance care cycles which will be of benefits to both recipients and caregivers. Since newly emerging systems are facing unprecedented cases, the database obtained by the aforesaid medical record platform should be commonly shared and utilized by the concerned parties. This will ensures the consistent continuity of care provision. The translational healthcare services which are consistent with care cycle requires new proficiency sets; the skills to communicate with different healthcare professionals in different expertise. This issue will be argued as a leadership style in details again in the last section.

8.3.5 Transition or care shift

Due to the first ever increasing aged population in the human history and the Japanese history in particular, health services systems are shifting from cure paradigm to care paradigm. Cure and care are not simply dualistic at clinical and welfare practices, however, the orientation of curing and that of caring are distinct in terms of the major target population, the dominant interventional approach and the place those interventions are implemented.

Curing, typically found in medicine and the on-the-edge pharmaceutical and device supported medicine in particular, has traditionally tended to focus on intervening in acute diseases in relatively young (age<65) population, whereas caring approach has been inclined to pay attention to intervening in chronic illnesses in presumably older (age>65) population. Curing approach has exhibited an orientation to fight against death or postpone the timing of death. However in caring approach, in terminal care and palliative care in particular, more efforts have been made on accepting rather than on rejecting or postponing death. The medical disciplines, especially those based on concrete evidences and empirically supported data, have been influential and dominant in curing practices. As such the approaches based on reductionism, having played a central part in natural sciences, have been recognized as effective in exploring organ-specific, cellular-specific, molecule-specific and genetic-specific solutions. The current examples of such approaches include the applications of iPS cells, molecular target drug, magnetic resonance imaging and drug delivery system to name just a few. On the contrary care approach is more holistic in that it upholds that all aspects of people's needs including physical, mental, and societal needs should be taken into account and seen and cared as a whole. It has been necessary and regarded effective as well to allocate resources collectively in one place at hospital in realizing complexity of cure practices. As argued previously in

former sections, the places of care have tended to get over the system boundary of hospital by infiltrating more deeply in local regions, communities and homes.

Care shift or the latent transition from curing to caring could posit another translational challenge from a view point of value co-creation for services in healthcare. In curing approach most frequently observed in modern medical practices, providers' view is dominant where physical artifacts play a significant role in the service provision, clinical efficacy, efficiency and safety are recognized as vitally important to justify, say, evidence-based medicine in each of the cases. Therefore quality of curing intervention is and always has been addressed in terms of providers' premises, i.e., empirically measurable structure, process and outcome. In caring, however, increasing number of population are living with chronic illnesses and facing deaths even under the provision of care services while lacking definitively effectual intervention to prevent or postpone their death, unless a novel innovation that enable eternal life comes true. Accordingly more people are inevitably accepting death while asking the meaning of living and dying. In curing approach patient or recipient is handled as cases, however, in caring they tend to be treated as 'stories' in pursuit of sharing the meaning as frequently practices these days in narrative approaches. Nowadays in palliative care, more efforts go on even 'spiritual pain' which is deeply rooted in patients' consciousness. Nevertheless the method of allying spiritual pain out of patients in sever dementia and those in persistent vegetative state has been a subject of controversy since there has not been very persuasive evidence based proof whether the patient feels pain or not.

In caring by and large, more idiographic emphasis is put on recipient or patient side, since vale is idiosyncratic to each of the peculiar stories, experiential and contextual depending on interactions among actors including individual care recipient. As such in the age of the care shift, translation between cure and care is becoming more important than ever, while we will face new challenges in co-creating value that we never experienced in the ages when curing paradigm was dominant.

8.4 Triad translational continuums

8.4.1 System praxis

Presuming the triad translational continuums model (Figure 8-9) could be helpful to understand how an agent behaves in terms of theory, action and systems. Figure 8-9 models how an agents interact among disciplines, practices and systems thinking. In Figure 8-9 theory or discipline corresponds to *episteme*, action or practice to *phronesis* and system praxis or intervention to *techne*, which were already discussed in the helical model of translational co-evolution of knowledge (8.2.2). As such the triad translational continuums model includes a translational continuum of disciplines, a translational continuum of practices and a translational continuum of intervention. These continuums do not exist separately, rather the three continuums mutually interact and evolve.

Agents' activity in health services refer to theories and translate those theories into practices and *vice versa*; that is, they translate practices into theories as well. Those activities are done cyclically and recursively between theory and action. At the same time the agents engaged in constructing theories, i.e., academicians usually try to establish discipline by referring practices and by systemizing theories. On the other hand clinicians engaged in various clinical settings try to optimize the effects of their actions by referring theories and by systemizing actions. Therefore the space of system praxis is positioned between theory and action. As already discussed such methodologies as action research, continuous improvement and translational research are translational in that those activities are to translate theory into action and *vice versa*. Note that the three types of translational continuums are translational in that an agent elsewhere translate each other. Also note that the traditional sciences tend to be positioned in the translational continuum of disciplines, however namely translational science should be positioned by comprehensively covering all of the three.
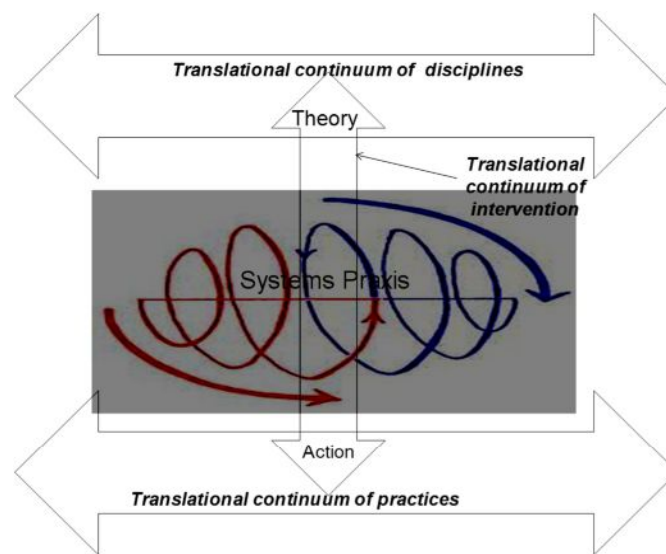
Figure 8-7: Triad translational continuum model

The novel idea for innovation is usually born at an offbeat shared context-in-motion at system practices in the form of new combinations or hybrids of existing elements, rather than wholly new. The eccentric agents generate innovative idea by spinning and drifting over boundaries of existing continuums of practices and disciplines. Such unconventional boundary-spinning behaviors are also recognized as interdisciplinary, cross-disciplinary and trans-disciplinary acts when seen from a conventional translational continuum of disciplines. At the same time, those aberrant behaviors are inter-practicum, cross-practicum and trans-practicum that leads to the new sets of practices.

Consequently both of translational continuums of disciplines and practices are transformed by boundary-spinning behaviors of agents.

8.4.2 Problems in disciplines

In the translational continuum of disciplines, however, there are innumerable chasms and walls. The tradition that university and research institutions are structured along disciplines and sub-disciplines has brought about numerous silos and sub-silos here and there. Although specialization still remains important, one of the shortcomings is that each specialized discipline tends to narrowly focus on particular configuration of resources. Thus academics have inclined to deal with discipline-specific issues. Each discipline and department has presumed sets of interests, methods and systemized methodologies by continuously deepening its specialized subject. As such these days cross-disciplinary, multidisciplinary, interdisciplinary approaches that enable to 'superset' the existing disciplines are frequently advocated.

Medical, paramedic and healthcare specialists are authorized by national and professional certification system. Accordingly curricula have been developed and provided by universities and professional schools. To name only a few, the silos include medicine, dental surgeon, nursing, pharmacy, medical laboratory technology, X-ray, occupational therapy, physical therapist, medical radiology technician, dietitian, orthoptics, clinical technician, speech-language-hearing therapist, emergency life-saving technician, certified social worker, certified social workers, certified care worker, birthing assistant, long-term care support specialist, and so forth. Also the professionals engaged in the research and development of novel pharmaceutical and medical devices obtain the discipline at graduate school or research institute including diversified biotechnology, bioinformatics and nano-technology and so forth.

Even only in the certified specializations for nurses there are such sub-silos as ambulatory care nursing, advanced practice nursing, burn nursing, cardiac nursing, cardiac catheter laboratory nursing, medical case management, community health nursing, critical care nursing, emergency and trauma nursing, environmental health nursing, flight nursing, forensic nursing, gastroenterology nursing, genetics nursing, geriatric nursing, home health nursing, hospice and palliative care nursing, hyperbaric nursing, immunology and allergy nursing, intellectual disability nursing, intravenous therapy nursing, infection control nursing, learning disability nursing, maternal-child nursing, medical-surgical nursing, psychiatric nursing, midwifery, neonatal nursing, neurosurgical nursing, obstetrical nursing, occupational health nursing, oncology nursing, orthopedic nursing, ostomy nursing, pediatric nursing, per anesthesia nursing, perioperative nursing, private duty nursing, psychiatric or mental health nursing, public health nursing, pulmonary nursing, radiology nursing, rehabilitation nursing, renal nursing, school nursing, sub-acute nursing, substance abuse nursing, surgical nursing, telephone triage nursing, transplantation nursing, travel nursing, urology nursing, and wound care.

8.4.3 Service systems thinking, service systems science and service systems engineering

The triad translational continuums allow us to construct a translational approach in addressing health services from both continuums of disciplines and practices such as service systems thinking, service systems science and service systems engineering.

The translational continuum of practices witnesses that the transition of care-shift towards integrated community care systems is going on. Also as described in the former section, a helical integration between university, industry and government is emerging to facilitate translational research and related activities. As such agents including executives, managers and health services professionals are facing new sets of problems caused by the transitions in both of the translational continuums of practices and disciplines while seeking solutions in systems praxis. In "putting theories into action" or executing "theory-informed practice" (Martin et. al. 2012), they find themselves in a deep-rooted dilemma or schizophrenic state resulting from the ill-structured problems in the translational continuums of disciplines and practices.

Praxis can be literally expressed as translating theories into action and translating action into theories by applying and learning in terms of systems. Also systems praxis could be expressed as translating 'systems thinking' to both continuums. Systems thinking, positioned at the central part of systems praxis in Figure 8-9, is a form of thinking that is informed not only by theoretical knowledge but also by practical knowledge. Put another way, systems thinking is implicitly required to resolve conflicts and complications between the two continuums, and at the same time explicitly needed to bridge over the two. When system thinking is translated or extended into the translational continuum of disciplines, it is then called 'systems science' that seeks theories of systems. When systems thinking is translated into and grounded with the translational continuum of practices, it is often named 'systems engineering' or 'systems exploration' that peruses to create new systems or modify the existing systems at work. In so doing the translational continuum of intervention or systems praxis is self-organizing itself by implicating, say, such systems thinking as hard systems thinking, systems dynamics, organizational cybernetics, complexity theory, SAST, interactive planning, soft systems methodology, action research, critical systems heuristics, team syntegrity, postmodern systems thinking, total systems integration, critical systems practice and complex adaptive systems.

Systems thinking is not a particular methodology, or it is not a practice. But it is a systems praxis circulating between the translational continuums of disciplines and practices. Therefore systems thinking is influenced by and influences both continuums of disciplines and practices. Systems thinking is framing and also reframing of thinking, an orientation to the world, and a model for applying and learning about systems of all kinds; those include, physical, such as carbon atom systems; biological, such as living organisms; designed, such as bicycles; abstract, such as value systems; social, such as families; human activity, such as human resources management; services, such as health care systems. Therefore it is possible to assume service systems praxis and construct a translational

approach in addressing health services from both continuums of disciplines and practices such as *service systems thinking*, *service systems science* and *service systems engineering*.

8.5 Translational leadership

Here a simple question is raised; that is, what kind of leader can realize translational changes leading to innovation? The discussion has so far focused on the translational features by addressing value co-creation in healthcare services primarily from the angles of co-evolution of knowledge and idea, translational reframing, cross-institutional translational resonance, translation between physical artifacts, non-physical services and care shift, and triad translational continuums model. Those arguments have been based on a critical organizational behavior in emerging innovation, i.e., shared context-in-motion, which was led by the empirical studies on high performers' competencies in healthcare services. The translational changes are brought about by a leader who build and lead shared context-in-motion elsewhere in the continuums, span system boundaries and adapt complexity and bridge and connect people by empathy.

8.5.1 Drift and span boundaries

Boundary-spanning and adaptive action makes agent drift outside of his or her own habituated patterns of intervention in both theory and action. Innovative persons fond of drifting around and they are prepared for being struck with an idea that instantly links the different existing ideas in different fields of knowledge. As a physician Ohura (Chapter 7) used be an orthopedist for long time, however his encounter with pressure ulcer at his clinical practices whipped up his interests then he began drifting around in the different field. Karandagoda (Chapter 6) came across with the 5S-KAIZEN method by chance when hanging around the corner of a library in Colombo. Interestingly he himself developed his leadership style by training novice persons who engaged in health services and by letting those span boundaries of their daily works in practicing the 5S-KAIZEN method. They are drifters in that they are always looking for something arousing their interests in knowing more. They behaved to enjoy and adapt with the differences, however, for them adaptation is to be exhibited as a kind of expression of new system of his or her own product.

As is detailed in Chapter 7, the innovators of pressure ulcer treatment *linked* the two ideas. First, they got an idea of the ill-problematic contexts of pressure ulcer in Japan. Second, they got an idea about the advanced status of methodology of risk assessment of pressure ulcer. Thus they *spanned* the cultural boundary. Then they got an idea to import and improve it by *connecting* the two ideas, i.e., improve it, and do it. Consequently a new idea of aligning the culturally and clinically modified risk assessment tool of pressure ulcer to the local population was created by *combining* the two.

8.5.2 Nest shared context-in-motion

A capable leader is able to nest shared context-in-motion elsewhere in the translational continuum of intervention by involving other individuals who have variety of contexts and various systems. Note that a capable scholar does not create it in the translational continuum of discipline, or a caliber business person does not find niche in the translational continuum of practices, but that they first create shared context-in-motion at the translational continuum of intervention then secondly they secure their niches at either or both of the translational continuums. Consequently they are able to realize such end-results as theories and practices. Also note that an effective leader is able to create niches at the continuums not only by circulating recursive cycle vertically but also by drifting it horizontally. As such horizontal drift brings them different sets of practices and theories that recursively realize variety of interventions.

The two directions are manifesting in health services; those are, specialization and integration. Remember from the previous discussion that disciplines and professional knowledge have tended to be specialized into silos and sub-silos towards distinct narrow and deep fields. From a knowledge creation perspective, shared context-in-motion puts the divided and subdivided knowledge in the process of synthesis.

The massive transitions are going on at least in two the major healthcare spheres including the converged contexts crossing among industry, university and government in translational activities as is shown in Figure 8-6, and diversifying patient-provider institutional interfaces as illustrated in Figure 8-8. To fertilize innovative knowledge and ideas out of contexts it is necessary to nest shared context-in-motion, where translational leaders not only effectively participate in new context, then interpret and objectify it, socialize in it, and translate what they crystallize into different contexts, but also efficiently build and lead shared context-in-motion. What counts in co-creating value in university-industry-government relations and forefronts of healthcare services is to nest shared context-in-motion, not to build facilities like science park, science café and technology transfer office.

8.5.3 Bridge and connect by empathy

Yet there is no *prima facie* relation between emotional factors and innovation, this section is a trial to address relation between the two. As empirically evidenced by the study of high performing agents in Chapter 5, outstanding agents are caliber not only because they exhibit technical expertise but also human relation competencies including interpersonal understanding, relation building and customer satisfaction orientation. This implies that high performing agents are conscious of relationship quality in service frontlines and they are cherishing relations with others in service back-yard.

In summary the outstanding nurses want to understand other people by accurately hearing and grasping the unspoken or partly expressed thoughts, feelings and concerns of others. They perceive the moods and feeling of others, and understand others based on listening and observation to predict

and prepare for others' reactions. They build or maintain friendly, reciprocal, and close-nit relationships or networks of contacts with people by consciously working at building rapport, extending oneself to build rapport. They at the same time establish rapport easily and share personal information to create common ground or mutuality. Also they focus their efforts on discovering and meeting the recipients' needs by seeking underlying needs of the client and by taking personal responsibility for correcting patient service problems.

The underlying emotional orientation of the above behaviors could be empathy. In that sense, empathy is capacity to understand, respect, bridge and connect people. Although there are a number of definitions of empathy, the two classifications and definitions of empathy fits well with the human competencies. First, cognitive empathy is the capacity to understand another's perspective or mental state (Rogers et al. 2007), which is a basement of Interpersonal Understanding (IU). Affective empathy is the capacity to respond with an appropriate emotion to another's mental states (Rogers et al. 2007), which plays a key role in Relationship Building (RB). Customer Satisfaction Orientation (CSO) involves both of cognitive empathy and affective empathy in that this orientation is dependent on communication amongst various agents including patients.

In such knowledge converging field as healthcare, no one knows knowledge of all the fields. Instead translational leaders are regarded to be adept in relating people by applying such competencies as interpersonal understanding, relationship building and customer satisfaction orientation. An underlying salient element of health services leader is empathy which ensures the process of dynamic translational activities.

Chapter 9: Conclusion and further research

This research investigated some of the translational features of value co-creation of healthcare services by conducting the mutually related four parts of studies conducted in four formats, i.e., 1) quantitative and empirical study (Chapter 4), qualitative and conceptual study (Chapter 5), explorative case method study (Chapter 6), and archival and descriptive research (Chapter 7). The studies included in Chapter 4 and 5 are structured and implemented as action research programs for a university hospital. Given the nature of action research program which enhances cognition recursively between theory and practice, these studies have already had impact, if not limited, to the dual sides of theory and practice of our clients.

Among others the client and researchers have designed and shared the meta value-in-context transformation model (Chapter 4), Competency Model (Chapter 3), evolutionary organizational learning model of the 5S-KAIZEN method (Chapter 5). In the sense, we have at least contributed to enriching the learning recursively cycling between theory and practice of our client institutions. We do not intend to proclaim, however, that our research has theoretical as well as practical positive effects or contribution solely because the research outcomes included in Chapter 4, 5 and 6 were accepted by our clients, or that our research was sponsored and then disseminated by the government (Ministry of Education, Culture, Sports, Science and Technology) and Japan International Cooperation Agency (JICA). We would rather claim that our research bears theoretical generality as follows:

First, we have found, through the empirical study done at one of the leading university hospitals, that high caliber nurses were adept in fostering, maintain and developing relationship with other diverse and heterogeneous actors including patients, patients' family, physicians and other technicians by exhibiting such competencies as Interpersonal Understanding and Relationship Building regardless of the role differences. Since some institutional aspects including culture, norms, history, organizational structure and processes could influence the cognition of the required competencies, the results herewith could be a unique example at a specific institution. However as discussed above the obtained data may imply some of the general tendency at on-the-edge university hospitals that innate the isomorphic institutional characteristics including emphasis on research, adaptation of on-the-edge technology, team approach, hierarchical organizational structure and authoritarianism to name just a few.

Given that much emphasis has been put mostly on technical education so far, these concerned in nursing education should pay more attention to fostering human side of service and relational aspect of services provision than developing only the technical skills. As such we aligned and installed competency model based on our findings. In modern service management and service marketing in particular, relationship in process and value co-creation (Elsevier 1995, Gronroos 2007)

is crucial in addressing the difference between exchange and relationship perspectives. Our findings could support such Nordic frame from a perspective of human competency study in clinical environment. This also leads to bridging service systems studies and health service studies, which have been researched separately.

Second, we proposed a meta model namely the meta value-in-context transformation model to explain the some of the features that an innovative agent intervenes in the contexts of his or her workplaces. The model explained that an innovative agent could co-create value-in-context by participating, interpreting, socializing, objectifying, and translating the context *per se*.

Third, by investigating the technology trajectory of risk assessment tools of pressure ulcer, we have described co-evolutionary processes of policy-interventional translational research and product-centric translational research cycle. This view, together with triad translational continuums model, could be helpful particularly to practitioners in aligning the processes of service innovation, especially service innovation in healthcare.

Fourth, from the above discussion, the helical model of translational co-evolution of knowledge was proposed to further explain the dynamics of shared context-in-motion. In shared context-in-motion, the agents in relation with other actors or thing hood, exhibit dynamic action and contextual transformation such as participation (*contextualization*), interpretation (*re-contextualization*), socialization (*co-contextualization*), objectification (*de-contextualization*) and translation (*trans-contextualization*). Although this model was derived from an empirical studies utilizing the existing theory of competency targeting the nursing human resources at a university hospital, it could bear generality in grasping a dynamic and translational feature of shared context-in-motion.

Fifth, the triad translational continuum model was extended from the aforesaid models to generalize the complex and adaptive behavior of agent in terms of theory, action and system praxis, where entrepreneurial activity, an essential element of innovation, is characterized as recursive dynamic activity that translate three translational continuums, i.e., discipline, practice and intervention or system praxis. Nowadays translational science is about attracting attention not only from the cutting-edge medical researchers engaged in translational research, but also from those investigating in systems thinking, system engineering and service science. What has been discussed hitherto could hopefully pave a road towards establishing translational science not as another silo at the translational continuum of disciplines but as a useful transdisciplinary approach in the translational continuum of intervention and in systems praxis.

Lastly the major parts of this research were conducted as a research action program. The co-created value, if any, through action research program included mutual learning, mutual experience and such internal model as competency, however, inevitably depended on the subjectivity and inter-

subjectivity of the concerned. Remember that the authors were positioned as an intervening agents in the midst of action research cycle. This logically follows that we were not appropriately positioned as an isolated observer from the phenomena who is able to describe it objectively. However the authors regard that action research program is one of the effective approach to describe services process from *inside* of the service contexts. First, action research facilitate organizational learning processes which plays a vital role in service provision. Second, action research, when implemented strategically, turns implicit knowledge into explicit knowledge that progresses co-experience of the concerned agents. Third, by putting the process of internalizing 'model' in action research program, the ownership of the internal model can be given at hands of the participants, not at hands of those who govern. As such in enhancing relationship paradigm of management, such approach of sharing internal model could be useful.

Further studies will be necessary in addressing the four issues as follows:

First, another study employing the same methodology as introduced in Chapter 4 should be implemented at another university hospital. The more data will be obtained, the more the empirical basement will be reinforced. Second, more efforts should go to case studies focusing on translational feature of service innovation including other method of treatment to empirically test the proposed models in this thesis. For instance, the case studies of big tickets technology-driven innovations, including computed tomography, magnetic resonance imaging and nuclear magnetic resonance will be useful to verify whether the identical translational cycles including policy-centric, service-centric or product-centric cycles manifest themselves. Third, key failure factors as well as key success factors of action research program should be identified when another action research program is implemented at hospitals. Fourth, most importantly, further conceptual study focusing on comparison amongst key constructs of system thinking, service studies and health services research will be required to appropriately translate and bridge those different areas of studies.

This thesis, the models proposed herein in particular, definitely promotes and contribute to developing translational approach in addressing innovation in health services by focusing on interactions among heterogeneous agents, especially on human aspects such as competency and share context-in-motion.

APPENDIX

Appendix A: Competency Questionnaire (Japanese)

　以下の 20 項目のコンピテンシー（人間力）のリストをお読みください。そしてリストの下に続く各質問に御回答ください。

1.リーダーシップ/Team Leadership

組織全体の方針、戦略、ビジョンを示し、その方向に組織を動機づけ動かす能力。

2.指導力/ Directiveness

危機的状況、環境変化の中で職位を背景に要求・指示によって状況を好転させる行動力。

3.育成力/ Developing Others

育成場面、機械を積極的に設定して OJT を行い周囲の人々を開発する力。

4.チームワーク/ Team Work

チームの一員として、目標達成に向けて協調的な行動をとる能力。

5.達成指向性/ Achievement Orientation

より高い成果を達成しようとする意欲や挑戦的な目標を達成しようとする傾向。

6.イニシアティブ/ Initiative

将来起こりうる問題やチャンスを予測し行動を事前に起こす能力。

7.顧客志向性/ Customer Satisfaction Orientation

他者のニーズを満たしたいという気持ちをもとに、顧客ニーズを発見し応えることに努力を集中する行動力。

8.徹底性/ Concern for Order

職務の質、正確さなどの面でより高いレベルを達成しようとする傾向。

9.柔軟性/ Flexibility

さまざまな状況、人間、グループや組織に効果的に対応するための行動特性。

10.分析的思考能力/ Analytical Thinking

より詳細に状況を比較・検討・分析し、効果的な対応や計画を立てる力。

11.概念化/ Conceptualization

ものごとや出来事のつながり、隠れたパターンを認識して見抜き、状況を統合的に理解する力。

12.情報志向性/ Information Seeking

情報を早く正確に、かつ幅広く収集する力。

13.専門性/ Expertise

職務に関する専門的、技術的知識を高めそれらを活用する能力。

14.対人影響力/ Impact and Influence

説得したり納得させたりして、自分や組織の目的達成に必要な関係者のサポートを得る能力。

15.対人感受性/ Interpersonal Sensitivity

人の気持ち、感情を察知して的確に理解し配慮できる
能力。

16.関係構築力/ Relation Building

人々と友好的関係やネットワークを構築し、維持する
姿勢。

17.組織感覚力/ Organizational Awareness

公式、非公式の力関係、風土を見抜き、それらを効果
的に活用する能力。

18.自信/ Self Confidence

問題解決、課題達成を効果的に行い、成果を上げる
ことができるという信念。

19.セルフ・コントロール/ Self Control

ストレス状況の中でも感情的にならず、ネガティブな
反応を回避する能力。

20.自発的努力/ Organizational Commitment

組織がより高い成果を収めることや仕事のプロセス、
成果を向上させることを目指した行動を自発的にとる
能力。

問 1 一般的に当病院の優秀な<u>看護師</u>が持つべきコンピテンシーはなんであるとお考えになりますか。上のリストから 6 項目を選んで重要と思われる順番にコンピテンシーの番号を記入してください。

☐　☐　☐　☐　☐　☐

問 2　一般的に当病院の優秀な<u>看護管理者(主任・病棟管理者・看護科長・看護部長)</u>が持つべきコンピテンシーはなんであるとお考えになりますか。上のリストから 6 項目を選んで重要と思われる順番にコンピテンシーの番号を記入してください。

☐　☐　☐　☐　☐　☐

問 3　一般的に当病院の優秀な<u>教育者(プリセプター・教育担当者・教育専従者・学生指導者)</u>が持つべきコンピテンシーはなんであるとお考えになりますか。上のリストから 6 項目を選んで重要と思われる順番にコンピテンシーの番号を記入してください。

☐　☐　☐　☐　☐　☐

問 4　近年、看護の現場では、新規技術、社会情勢の変化・変革の波が訪れています。これらにうめく対応するためのコンピテンシーはなんであるとお考えになりますか。上のリストから 6 項目を選んで重要と思われる順番にコンピテンシーの番号を記入してください。

☐　☐　☐　☐　☐　☐

Appendix B: Definition of Competencies and Behavioral Indicators (BI)

Leadership cluster

1. Team Leadership (TL)

The intention to take a role as a team or other group. A desire to lead others.

BI: Inform people: let people affected by a decision know what is happening. Make a personal effort to treat all group members fairly. Use complex strategies to promote team morale and productivity. Make sure that practical needs of the group are met. Ensure that others buy into leader's mission, goals, agenda, climate, tone and policy.

2. Directiveness (DIR)

The individual's intent to make others comply with his or her wishes. Directive behavior has a tone of "telling people what to do".

BI: Confront others openly and directly about performance problems. Unilaterally set standards; demand high performance, quality, or resources. Insist on compliance with own orders or requests in a "put my foot down" style.

3. Developing Others (DEV)

A genuine intent to foster the long-term learning or development of others with an appropriate level of need analysis and other thought or effort.

BI: Express positive expectations of others even in difficult cases. Believe others want to and can learn. Give directions or demonstrations with reasons or rationale. Give negative feedback in behavioral rather than personal terms. Identify a training or developmental need and design or establish new programs or materials to meet it.

4. Team Work (TW)

The intention to work cooperatively with others, to be part of a team, to work together, as a member of a group (rather than as a leader) as opposed to working separately or competitively.
BI: Solicit ideas and opinions to help others form specific decisions or plans. Keep people informed and up-to-date about group process, share all relevant information. Express positive expectations of others. Credit others publicly for accomplishments. Encourage and empower others, make them feel strong or important.

Achievement and Action Cluster

5. Achievement Orientation (ACH)

Wants, plans, acts to meet or surpass a standard of excellence; measures outcomes against goals; innovates to improve; takes calculated risks to do something new or better.

BI: Set and act to reach challenging goals for self or others. Work to meet a standard set by management. Take decisions or setting priorities based on explicit considerations of potential profit, return-on-investment or cost-benefit analysis. Take calculated entrepreneurial risks.

6. Initiative (INT)

Identification of a problem, obstacle or opportunity and taking action in light of that to address current or future problems or opportunities.

BI: Resist and refuse to give up when faced with obstacles or rejection. Recognize and seize opportunities. Try to perform far more than the job requirement. Anticipate and prepare for a specific opportunity or problem that is not obvious to others.

7. Concern for Order (CO)

An underlying drive to reduce uncertainty in the surrounding environment. It is expressed in such forms as monitoring and checking work or information, insisting on clarity of roles and plans.

BI: Monitor and check work or information. Insist on clarity of roles and functions. Set up and maintain systems of information.

8. Information Seeking (INF)

An underlying curiosity, a desire to know more about things, people, or issues drives Information Seeking. Making an effort to get more information, not accepting situations "at face value".

BI: Dig or press for exact information or resolution by asking questions. Scan for potential opportunities that may be of future use. Get others involved to seek out information.

Cognitive Cluster

9. Analytical Thinking (AT)

Understanding a situation by breaking it apart into smaller pieces, or tracing the implications of a situation in a step-by-step causal way.

BI: Set priorities for tasks. Break down a complex task into manageable parts. Recognize several likely causes of events, or several consequences of actions. Anticipate obstacles and think ahead about next steps. Use several analytical techniques to identify solutions.

10. Conceptual Thinking (CT)

The ability to identify patterns or connections between situations that are not obviously related, and to identify key or underlying issues in complex situations.

BI: Use common sense and past experience to identify problems or situations. See crucial differences between current situation and things that have happened before. Apply and modify complex learned concepts or methods appropriately. Identify useful relationships among complex data from unrelated areas.

11. Expertise (EXP)

Mastery of a body of job-related knowledge, and also the motivation to expand, use, and distribute work-related knowledge to others.

BI: Act to keep skills and knowledge current. Show curiosity by exploring beyond the immediate field. Volunteer to help others resolve technical problems. Take courses or teach self-new subject. Actively go out as a technical missionary or change agent to spread new technology.

Helping and Human Service Cluster

12. Customer Satisfaction Orientation (CSO)

A desire to help or serve clients, to meet their needs. It means focusing one's efforts on discovering and meeting the client's needs.

BI: Seek information about the real, underlying needs of the client. Take personal responsibility for correcting customer service problems. Correct problems promptly and undefensively.

13. Interpersonal Understanding (IU)

Want to understand other people. It is the ability to accurately hear and understand the unspoken or partly expressed thoughts, feelings and concerns of others.

BI: Perceive the moods and feeling of others. Understand others based on listening and observation to predict and prepare for others' reactions. Understand the attitudes, interests, needs and perspectives of others.

Impact and Influence Cluster

14. Impact and Influence (IMP)

Actions to persuade, convince, influence or impress others, in order to get them to support the speaker's agenda; or the desire to have a specific impact or effect on others.

BI: Anticipate the effect of an action or other detail on people's image of the speaker. Appeal to reason, data, facts and figures. Use concrete examples, visual aids, and demonstrations. Assemble political coalitions, build "behind-the-scenes" support for idea.

15. Relation Building (RB)

Builds or maintains friendly, reciprocal, and warm relationships or networks of contacts with people.

BI: Consciously "working at" building rapport, extending oneself to build rapport. Establish rapport easily. Share personal information to create common ground or mutuality. Network or establish friendly relations with many people who may be called for information or other assistance.

16. Organizational Awareness (OA)

The individual's ability to understand the power relationships in his or her own organization or in another organization, and at the higher levels, the position of the organization in the larger world.

BI: Understand the organization's informal structures. Identify key actors and decision-influencers. Recognize unspoken organizational constraints. Recognize and address the underlying problems, opportunities, or political forces affecting the organization.

Personal Effectiveness Cluster

17. Flexibility (FLX)

The ability to adapt to and work effectively with a variety of situations, individuals, or groups.

BI: Recognize the validity of opposing viewpoints. Adapt easily to changes at work. Flexibly apply rules and procedures. Change own behavior or approach to suit the situation.

18. Self Confidence (SCF)

A belief in one's own capability to accomplish a task and select an effective approach to a task or problem. Confidence in one's ability as expressed in increasingly challenging circumstances, and confidence in one's decisions or opinions.

BI: Make or act on decision in spite of disagreement from others. Present self in a forceful or impressive manner. State confidence in own judgment or ability. State own position clearly and confidently in conflicts with superiors.

19. Self Control (SCT)

The ability to keep emotions under control and to restrain negative actions when tempted, when faced with opposition or hostility from others, or when working under conditions of stress.

BI: Is not impulsive. Resist temptation to inappropriate involvements. Remain calm in stressful situations. Find acceptable outlets for stress. Respond constructively to problems even under stress.

20. Organizational Commitment (OC)

The ability and willingness to align his or her own behavior with the needs, priorities, and goals of the organization, to act in ways that promote organizational goals or meet organizational needs.

BI: Being willing to help colleagues complete the tasks. Aligning own activities and priorities to meet organizational needs. Understand need for cooperation to achieve larger organization objectives. Choose to meet organizational needs to pursue professional interests.

Appendix C: Coded text of narrative: example

Ｑ：なるほど、はい。いろんな患者さんと接してきたと思うんですけれども、Ｎさんご自身の気持ちの中で、大きな印象を残している患者さん、何人かいると思うんだけど、何人か説明してもらえますかね。

Ａ：分かりました。古い年代から行きますと、３人ほどはすごく記憶に残る方がいるんですけれども、１人はＭＳの患者様で、若い、当時 17 歳とか 18 歳ぐらいだったと思うんですけれども、その患者さんがＭＳにしては、かなり頭の中の所見がかなり大きかったので、脳腫瘍じゃないかって言われて生検をして、生検のその結果でＭＳだったということで、神経内科のほうに移動してきた患者様がいまして、やはりそのときの記憶は、患者さんご自身はほとんどないような感じだったんですけれども、かなり所見が大きかったのでお母様とのかかわりが、特に密になってくるようなかたちで、で、ご本人もすごく明るい子だったので、ＭＳっていっても、初発だったものですから、本人の病気の受け止めはどこまでだったのかは分からないんですけど、お母さんと退院調整するに当たって、すごく一生懸命、お母さんとお家の間取りだったりとか、あとは本人の生活だったりとかというのを対応させてもらいながら、深くかかわった IU, RB, OC というのが、その事例が初めてだったように思っています。

Ｑ：この事例で、具体的に、Ｎさんはどういうかかわりをされたんでしょうか。

Ａ：はい、そのとき、まだ３年目ぐらいでしたので、まだ私自身も、かなり未熟だったので、そんなにお母さんの心境的に、自分の年齢でお母さんにっていうのは、かなり難しい思いをしながらやったんですけれども、やはり精神的なところ、お母さんの精神状態を把握して、そこにケアを深く入るというのは、やっぱり自分のそのときにはできていなかったんじゃないかと思うんですけれども、ただ、患者さん本人とは向き合いながら、何て言うんですかね、在宅、帰宅においての支援と言うか、自宅に帰るための支援というのを、記憶障害が結構残っているような感じだったので、そこで危なくない生活で、家に１人に置いてどうしていくかというところのかかわりをしていった RB, TW, INT, CSO, IU という記憶があります。

Ｑ：なるほど。17 歳の患者さんに対して、どういう言葉を発しました？

Ａ：年齢がそのときは、その彼女と近かったので。

Ｑ：彼女ね。

Ａ：はい、お母様でなくて、彼女と私がそんなには離れて、まあ、離れてますけれども、そこまであれだったので、普通に、どうでしょうか、普通の会話の話しかけをしていたような気がします。ちょっと 10 年ほど前なので、細かい会話の内容は覚えていないんですけれども、ただご本人さんもしゃべっても、そんなに記憶はないんだけど、頭ももうオペをしているので、髪の毛もない状態、もちろん、剃っているだけなので、生えてくるんですけれども、そういうのもそんなに気にする子でなくて、すごく明るい前向きな子でしたので、何かをすごく不安に思うとか、つらいということはなかったので、定期的に顔を出すというような感じで、その当時はやっていた RB, CSO ように思います。

Ｑ：これ、17 歳の女性患者さん、Ｎさんのことは、きちんと受け止めてもらったんでしょうかね。

Ａ：そうですね。まあ、ただ、私自身もまだ２年目、３年目ぐらいのときは、患者さんのありのままを受け止めるということが、なかなか今思うと、やっぱりできていなかったんだと思うんです。で、それをさせてもらうのに、もう少しあとにかかわった事例で、やっぱりそういう事例で、一生懸命かかわってはいたんですけれども、やっぱり患者さんの

ありのままを受け止めて、そこから展開していくというのが、まだ、その当時はできていなかったと思うんですね。その若い女の子とかかわっていた当時は。

Q：で、2つ目の事例辺りは、どういうかかわりなんでしょうかね。

A：そうですね。そのあとは、やっぱり病棟時代にかかわった患者さんなんですけれども、その男性は、50代後半から60代で、年齢はきちんと覚えていないんですが、男性で、で、脳梗塞でご入院されてきました。で、その方が、一見何と言いますか、離棟とかしてしまったような患者様で。

Q：離婚。

A：離棟、患者さんが病棟から出てしまうような感じの方で、一見すると、怖い感じの見た目というか、言葉の発し方だとかがちょっと怖い感じで、で、離棟してしまった理由も、入院してすぐだったので、分からないまま出て行ってしまって、探して戻ってきてっていう、戻ってきてか、バス停で見つかったとか、そういう感じだったんですけど。で、戻ってきたというところで、その当時、まだ入院して、本当に数日の間に離棟してしまったので、まだ受け持ちナースが付いていない状況で、で、そのころ、確か私がリーダーナースだったので、そういう患者様をメンバーに任せるのもと思って、自分で受け持った方だったんですけれども、やっぱり最初は、なかなか心を開いてくれなくて、毎日通うんですけど、こちらも怖い、怖いと思いながらも、毎日行きながら、世間話から入ってという感じでかかわっていたんですが、その患者さんが何か、いろいろ多分、私生活で今までいろいろ我が儘というか、奥様に迷惑って言っていいのか分かんないんですけど、迷惑をかけたり、娘さんに心配をさせたりというような生活をしてきたようだったんですけれども、そういうことをぽつりぽつりと話してくれるようになって、で、毎日、毎日、外に出たいということで、桜が咲く時期だったと思うんですけど、毎日外に車椅子でお散歩にお連れしてというような感じで、そこからずっとかかわりを深めていって、で、それからだんだん心を開いてくれるようになって、毎日1時間ぐらい話をして帰ってくるというようなかたちでかかわっていた IU, IMP, INT, CSO んですけれども、その患者様とかかわるようになってから、いろんな話を聞く中で、そういう人生を教えてくれたっていう患者さんに、そういうやっぱり感謝の思いも出るようになりま

Appendix D: The Norton Scale (1962)

NORTON PRESSURE ULCER SCALE

Resident's name: _Mrs. T_

Parameter	Score	⇩ Resident's condition ⇩	DATE ⇒ "admission" #/##/##
PHYSICAL CONDITION	4	GOOD	3
	3	FAIR	
	2	POOR	
	1	BAD	
MENTAL STATE	4	ALERT	2
	3	APATHETIC	
	2	CONFUSED	
	1	STUPOR	
ACTIVITY	4	AMBULANT	3
	3	WALKS WITH ASSISTANCE	
	2	CHAIRBOUND	
	1	BED REST – BED BOUND	
MOBILITY	4	FULLY MOBILE	2
	3	SLIGHTLY LIMITED	
	2	VERY LIMITED	
	1	IMMOBILE	
CONTINENCE	4	CONTINENT	3
	3	OCCASIONAL INCONTINENCE	
	2	USUALLY INCONTINENT OF URINE	
	1	INCONTINENT OF BOWEL & BLADDER	
CONTINENCE	4	CONTINENT	3
	3	OCCASIONAL INCONTINENCE	
	2	USUALLY INCONTINENT OF URINE	
	1	INCONTINENT OF BOWEL & BLADDER	
		NORTON TOTAL ⇒	13

Mark a "✓" for each of the following conditions if present:

DIAGNOSIS OF DIABETES	✓
DIAGNOSIS OF HYPERTENSION	✓
Abnormal HEMATOCRIT (DONE WITHIN PAST 90 DAYS) date: _"in the ED"_ RESULT: _34%_	✓
Abnormal HEMOGLOBIN (DONE WITHIN PAST 90 DAYS) date: _"in the ED"_ RESULT: _10.8g/dl_	✓
Abnormal ALBUMIN (DONE WITHIN PAST 90 DAYS) date: _"in the ED"_ RESULT: _3.1 g/dl_	✓
FIVE OR MORE PRESCRIPTION MEDICATIONS	✓
FEBRILE > 99.6 F	✓
CHANGES IN MENTAL STATUS TO CONFUSED, LETHARGIC WITHIN 24 HRS	✓
NORTON TOTAL FROM ABOVE ⇒	13
NUMBER OF CHECK MARKS FROM ABOVE	~8
Subtract number of ✓s from Norton Score to determine **NORTON PLUS SCORE**	5

SCORES: 16–20 = LOW RISK; 11–15 = MODERATE RISK; 10 or below = HIGH RISK

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Appendix E: The Braden Scale (1986)

Sensory Perception: Ability to respond meaningfully to pressure-related discomfort   **SCORE**
1. **Completely Limited:** Unresponsive (does not moan, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation. OR limited ability to feel pain over most of body surface.
2. **Very Limited:** Responds *only* to painful stimuli. Cannot communicate discomfort except by moaning or restlessness. OR has a sensory impairment which limits the ability to feel pain or discomfort over half of body.
3. **Slightly Limited:** Responds to verbal commands but cannot always communictue discomfort or need to be turned. OR has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.
4. **No Impairment:** Responds to verbal commands. Has no sensory deficit which would limit ability to feel or voice pain and discomfort.

Moisture: Degree to which skin is exposed to moisture   **SCORE**
1. **Constantly Moist:** Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.
2. **Very Moist:** Skin is often but not always moist. Linen must be changed at least once a shift.
3. **Occasionally Moist:** Skin is occasionally moist, requiring an extra linen change approximately once a day.
4. **Rarely Moist:** Skin is usually dry; linen requires changing only at routine intervals.

Activity: Degree of physical activity   **SCORE**
1. **Bedfast:** Con ed to bed.
2. **Chairfast:** Ability to walk severely limited or non-existent. Cannot bear own weight and/or must be assisted into chair or wheelchair.
3. **Walks Occasionally:** Walks occasionally during the day, but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.
4. **Walks Frequently:** Walks outside the room at least twice a day and inside room at least once every 2 hours during waking hours.

Mobility: Ability to change and control body position   **SCORE**
1. **Completely immobile:** Does not make even slight changes in body or extremity position without assistance.
2. **Very Limited:** Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.
3. **Slightly Limited:** Makes frequent though slight changes in body or extremity position independently.
4. **No Limitation:** Makes major and frequent changes in position without assistance.

Nutrition: Usual food intake pattern   **SCORE**
1. **Very Poor:** Never eats a complete meal. Rarely eats more than 1/3 of food offered. Eats 2 servings or less of protein (meat or dairy products) per day. Takes fluids poorly. Does not take a liquid dietary supplement. OR is NPO and/or maintained on clear liquids or IV for more than five days.
2. **Probably Inadequate:** Rarely eats a complete meal and generally eats only about half of any food offered. Protein intake includes only 3 servings of ineat or dairy products per day. Occasionally will take a dietary supplement. OR receives less than optimum amount of liquid diet or tube feeding.
3. **Adequate:** Eats over half of most mealls. Eats a total of 4 servings of protein (meal, dairy products) each day. Occasionally will refuse a meal, but will usually take a supplement if offered. OR is on a tube feeding or TPN regimen, which probably meets most of nutritional needs.
4. **Excellent:** Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.

Friction and Shear   **SCORE**
1. **Problem:** Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures, or agitation leads to almost constant friction.
2. **Potential Problem:** Moves feebly or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down
3. **No Apparent Problem:** Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times.

Braden Scale Scores
1 = Highly Impaired	NPO: Nothing by Mouth	
3 or 4 = Moderate to Low Impairment		
Total Points Possible: 23	TV: Intravenously	**Total Score:**
Risk Predicting Score: 16 or Less	TPN: Total parenteral nutrition	

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Appendix F: The K-Scale (1998)

Appendix G: The OH Scale (2004)

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