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Evaluating training effectiveness in a dyadic relationship -a qualitative study of value co-creation between an educational institution and a small business

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Abstract

A novel and valuable theoretical perspective has been provided by service-dominant logic (S-D logic) that triggers a reconsidering and reevaluation of concepts regarding conventional literature, particularly on innovation in trans-disciplinary vectors. Training is service which is provided by many professional institutions. However, all trainings are not very effective and trainees do not feel that they gain value from these trainings. This paper reports a qualitative study about a dyadic relation particularly between IT instructor (Women Entrepreneur training project, GCU Lahore) and a female trainee (entrepreneur), which is based on mutual trust. Purpose of this co-creation is to derive learning value for trainee and economic/financial value for business, as these values are examined through the lens of service dominant logic by using service system framework proposed by Lyons and Tracy (2013). Gioia methodology has been used for data collection from both, IT instructor and a female trainee by adapting an open-ended interview instrument (questionnaire) proposed by Lyons and Tracy (2013). The results are discussed with respect to implicatons on theoretical aspects of service science, service system and service innovation, where Information Technology (IT) plays a sgnificant role.

Key words: Dyadic relationship; Value co-creation; Service Dominant logic; Information Technology; Service innovation

1. Introduction

In the recent decade, emphasis on services is dynamically growing in all business activities including such businesses predominantly established on manufacturing ideology (Sjödin et al., 2020; Feser & Proeger, 2018). Now-a-days, core business functions of firms are transferring towards more competitive model based on strong foundations of service dominant logic, service quality and service innovations. Moreover, world has been connected

"economically, technically, and socially" due to globalization and advancement of technology (Avny, 2019; Evangelista et al., 2013), also globally integrated enterprises are emphasizing heavily to offer aggregate products and services for customer solutions (Giddens, 2018; Qiu, 2009).

Perano, Casali and Abbate (2018) highlighted in their study that in recent times, the concept of 'Service' is dominating majorly "theoretical models, enterprise strategies, corporate governance, decision-making processes, educational aspects and virtually all business and social relationships." This is mainly due to increasing dependence of economies on "human knowledge and the application of information" in order to create benefits in multiple aspects (Vargo & Lusch, 2016; Spohrer, Anderson, Pass, & Ager, 2008).

During the past decade, an evolution in the concept of service itself has been a triggering factor in major developments globally (Grönroos & Gummerus, 2014). These developments encompass a major sphere starting from historical interpretations of services as an 'intangible goods' to significant multi-dimensional conceptualizations (Lusch & Nambisan, 2015), such as "service dominant logic (S-D logic) and service science, management, engineering and design (SSMED), or simply, service science (SS)."

S-D logic encompasses the ideology of service as an application "through deeds, processes, and performances" and utilization of specialized operant resources i.e. particularly knowledge and skills, to benefit another entity or for the entity itself. Concept of S-D logic heavily emphasizes on the co-creation of value through the process of doing something for and with other individual or entity (Opata et al. , 2019; Pohlmann & Kaartemo, 2017). Thus, S-D logic portrays service as a denominator which is common in all exchange processes, and for the provision of service, goods are considered mere vehicles in aforementioned exchange process (Vargo & Lusch, 2008; Vargo & Lusch, 2006; Vargo & Lusch, 2004).

Precisely the concept of service science can be elaborated as an emerging multidisciplinary field which is based on the study of two foundational pillars i.e. service systems and value co-creation (Jaakkola, Helkkula, & Aarikka-Stenroos, 2015). The concept of service science can be defined as, "dynamic value co-creation configuration[s] of resources, including people, organizations, shared information (language, laws, measures, methods), and technology, all connected internally and externally to other service systems by value propositions" (Spohrer, Vargo, Maglio, & Caswell, 2008). Alot of things can be considered as service systems which include multiple aspects i.e. "people, corporations, foundations, non-governmental organizations, nonprofits, government agencies, departments in an organization, cities, nations, and even families" (Spohrer, Anderson, Pass, & Ager, 2008). Moreover, service systems are viewed as the significant fundamental

abstraction in terms of service science (Maglio, Vargo, Caswell, & Spohrer, 2009). Furthermore, a lot of renowned companies across business landscape are embracing services by considering it as an engine for their growth factor. Across socioeconomic sectors, the prevalence of service emerges due to multiple intersecting trends worldwide (Bryson et al., 2004). The rapid rise in standard of living of mankind both in developed and developing economies, is leading towards increased expectations and demand for personal services i.e. "healthcare, education, personalized training and entertainment", which is eventually triggering growth in the sector of personal service (Vargo & Lusch, 2017).

Due to rapid dynamic developments and extensive utilization of Information & Communication Technologies (ICTs), service innovations are largely taking place now-a-days (Sudbury-Riley et al., 2020; Kauffman, Liu, & Ma, 2015). Predominantly in service innovations, ICTs are considered as technological gadgets in process of service delivery, leading towards enhancement of productivity and efficiency of service organizations (Shao & Lin, 2016; Barras, 1990).

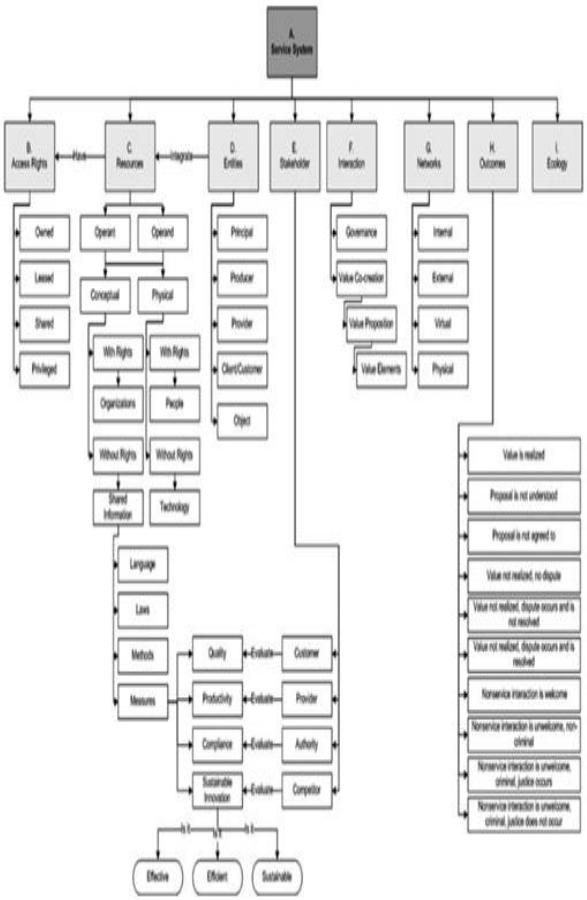
Further adding to this, training is a service which is provided by many professional institutions. However, all trainings are not very effective and trainees do not feel that they gain value from these trainings. Broadly, this study focuses on a training institution (Government College University, Lahore), which is awarded a project where training has to be provided to women entrepreneurs in Pakistan. For this training, the training institute (GCU Lahore) works with the World Bank to understand the training needs of these women entrepreneurs. Based on the training need assessment, GCU Lahore develops a training curriculum and plans the training.

In this scenario, the women entrepreneurs who are going to get these trainings explain and share their training needs. The training provider not only develops curriculum based on different business sector requirements, but also delivers the training in such a format which is most suitable to these trainees. For instance, the training is delivered to every batch only on Saturdays in GCU Lahore for a period of 3 months, because these women run their own businesses and they do not have time during the week. Secondly, the training is not purely academic, since many of these women do not have the academic background or they do not really need a training certificate or diploma. What they need is the actual skill and knowledge that they want to gain from this training. Most of the trainings are hands-on, where they actually discuss and work on their real life challenges. When such information is shared by the trainee before the start and during the training, it helps the training provider to deliver which is much more valuable. Through this value is co-created by the trainee and the training provider.

Precisely, the purpose of present research is to examine and highlight service bundles

and related components of a dyadic relation particularly between IT instructor (Women Entrepreneur training project, GCU Lahore) and a female trainee, based on mutual trust by utilizing and adapting service system framework proposed by Lyons and Tracy (2013). Literature is also available where multiple researches have explored dyadic relationship between teacher and student from different perspectives (Cadima et al., 2016; Schulte-Pelkum et al., 2014).

Moreover, purpose of this co-creation is to derive learning value for trainee and economic/financial value for business, as this study also aims to figure out these values in present research through the lens of service dominant logic. For present study, required information has been collected from both, IT instructor (Women Entrepreneur training project, GCU Lahore) and a female trainee (Entrepreneur, fashion designer) by utilizing an open-ended interview instrument (questionnaire) presented by Lyons and Tracy (2013). Being a fashion designer, purpose of aforementioned trainee was to boost business revenues of her online clothing brand and products, and her major focus was to increase online sales through use of technology and social media i.e. face book page. She owned a small physical office but she was operating her business only through aforementioned face book page. She shared her training needs with IT instructor who designed customized training, hence, value was co-created through this way.



Furthermore, reasons behind selecting specifically IT instructor is because Information Technology (IT) is extremely significant field now-a-days and small business also needs to have a website, IT instructor train and guide them to build their website and sell their products online. Since every business setup needs IT for every function in modern world, therefore, IT is viewed as a core component. IT is basically the platform/ enabler, as every business can run better with application of advance technology. IT covers overall business aspects, whereas marketing and finance instructor would only cater their particular specialized field, therefore IT instructor has been selected because it mostly

encompasses overall areas of small business. Below is the Service System Framework proposed by Lyons and Tracy (2013):

Figure 1. Service System Framework

2. Literature Review

2.1. Recent Concepts of Service

A number of researches highlighted service as the "provision of assistance and expertise", which is possible through interaction of provider-client so that value can be created and captured in business, education, professional trainings, government, and personal endeavors (Katzan, 2008; Perano, Casali, & Abbate, 2018). From the perspective of resources, services can be defined as a series of activities encompassing multiple resources i.e. "employees, physical resources, goods, systems of service providers"; these resources are utilized to find a solution to a particular problem of a customer (Breidbach & Maglio, 2016). Barile and Polese (2010) also highlighted in their research that service can also be defined as an "interaction between entities in a reticular system, to improve value co-creation outcomes under win–win logic inside interrelated processes". Table 1 highlights an example of Information Technology that give rise to new professions and services.

Table 1. Examples of Substitution relation within Self-Service (Rojas Giraldo, 2011)

Service Industry	Human Contact	Technology Assisted service	Electronic Service
Banking	Teller	ATM	Online Banking
Grocery	Checkout Clerk	Self-Checkout Station	Online order/Pickup
Airlines	Ticket Agent	Check in Kiosk	Print Boarding Pass
Restaurants	Wait Person	Vending Machine	Online order/Delivery
Movie Theater	Ticket Sale	Kiosk Ticketing	Pay for View
Book Store	Information Clerk	Stock-Availability Terminal	IPAD
Music Store	Information Clerk	DVD reader	IPHONE/IPOD
Library	Librarian	Computer Database	Electronic library
Education	Teacher	Computer Tutorial	E-Learning
Gambling	Poker Dealer	Computer Poker	Online Poker

2.2. Service Industry

A lot of researches revealed that in our industrial world, service sector is considered as a dominant economy. In this digital and technological advanced era, 80% jobs are in service sector (Ateetanan & Shirahada, 2016). Moreover, vast implications for multiple fields i.e. "academics, knowledge creation, education, professional trainings, business practice, and government policy" prevail due to rapid and dynamic growth of services in entire world (Nowick et al., 2018) (see figure2).

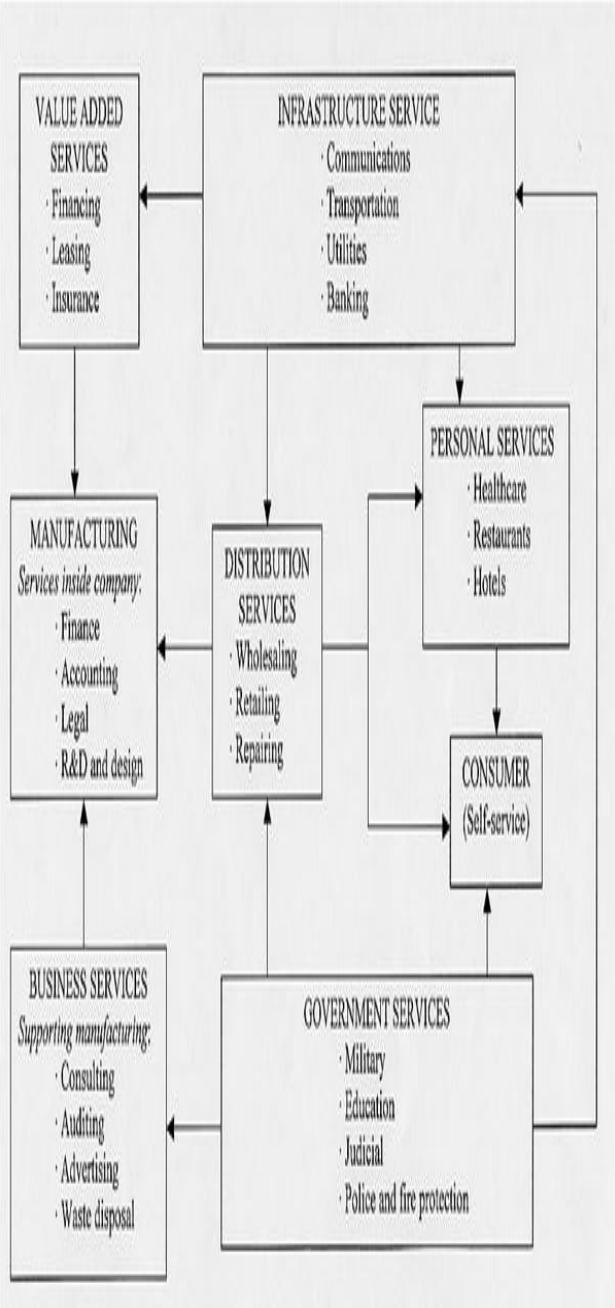


Figure 2. Role of Services in an Economy

2.3. Service Science

In literature, service science has been highlighted as a new discipline which is the study of service dominant logic and service systems particularly (Pohlmann & Kaartemo, 2017; Lyons & Tracy, 2013). It is also rooted in the interdisciplinary study of "computer science, operations, industrial engineering, mathematics, research business strategy, management sciences, decision theory, social and cognitive sciences and legal sciences". Service science highlighted the concept of S-D logic which differentiated services and goods prominently by identifying difference between Goods dominant logic and Service dominant logic (Jaakkola, Helkkula, & Aarikka-Stenroos, 2015; Zeithaml, Parasuraman, & Berry, 1985).

2.4. Service Dominant Logic

Service science provides strong foundational support to service dominant logic as it is majorly concerned with value-in-use (Lusch & Nambisan, 2015). In this concept, roles of both parties i.e. producers and consumers are not distinct as they always interact with each other so that value can be co-created through their interaction (Perano, Casali, & Abbate, 2018). Moreover, "value is co-created through the combined efforts of firms, customers, employees, government agencies, stakeholders and other entities related to any given exchange, but is always determined by the beneficiary (e.g. customer)" (see figure 3).

Application field	Focus/implications	References
Arts philosophy and creative industries	Using S-D logic to discuss arts as a resource that is integrated into everyday life.	Boorsma (2006)
	Guiding the practices of the creative industries by drawing on S-D logic and the metaphor of a "value creating ecology".	Hearn et al. (2007)
Design thinking/service design	Linking service-dominant (S-D) logic and design science to advance service system design.	Chen and Vargo (2010)
	Drawing from S-D logic to see designing for service as an exploratory process that aims to create new kinds of value relation between diverse actors within a socio-material configuration.	Kimbell (2011b)
Ecosystem services (ES)	Infusing S-D logic and the ecosystem service approach from natural sciences to create a service-dominant value creation (SVC) framework.	Matthies et al. (2016)
Education	Applying concepts of SDL such as cocreation to foster engagement, learning experiences and outcomes in large classes.	Jarvis et al. (2014)
	Exploring the implications of S-D Logic for business education.	Semenjn, Semenjn, and Cambiln (2011)
Engineering	Examines the challenges and opportunities of product-service systems for manufacturing firms.	Isaksson et al. (2009)
	Advocating a "paradigm shift from leadership in technology to leadership in use" by drawing upon S-D logic and other supporting literature.	Meier et al. (2011)
Health	Applies S-D logic to examine the importance of oncology patients' participation in the value co-creation process and its effect on perceived quality.	Rehman et al. (2012)
	Draws on S-D logic to build a research agenda to use value co-creation as a basis for studying patient engagement in micro-level encounters in health care.	Hardyman et al. (2015)
	Authors propose a new paradigm for envisioning value in health care based on S-D logic.	Joiner and Lusch (2016)
Information systems/computer science	Extending information systems research by placing service and service metaphors as core aspects of the field.	Alter (2010)
	Connecting service-oriented architecture (SOA) and S-D logic have been used to develop an ontology for collaborative manufacturing.	Yan et al. (2010)
Innovation studies	An expanded and strategic view of discontinuous innovations through an SDL lens.	Michel et al. (2008)
	Reconciling diverging views on innovation by drawing on S-D logic and its service ecosystems perspective.	Vargo et al. (2015)
Management	Urging management education and research to adopt a service-dominant logic perspective and related concepts.	Ford and Bowen (2008)
	Drawing upon service systems thinking and S-D logic to build an internally consistent framework for management research dealing with organizations, employees and customers in the context of services.	Subramony and Douglas Pugh (2015)
	Examining S-D logic as a conceptual foundation to address strategies and guide new businesses in emerging economies.	Pels (2012)
Public Administration Service science	Draws insights from S-D logic to public management to develop a (public) service-dominant logic.	Osborne et al. (2013)
	Establishing S-D logic as a foundation for service science and the service systems as a basic unit of analysis.	Maglio et al. (2009)
	Draws on S-D logic when casting service science as a transdiscipline based on symbolic processes that adaptively compute the value of interactions among systems.	Spohrer and Maglio (2010)
Tourism	Demonstrates the importance of S-D logic in uncovering the role played by co-production and co-creation in the tourism industry.	Shaw et al. (2011)
	Uses S-D Logic as a framework for advancing understanding of intangible assets within the hotel industry.	FitzPatrick et al. (2013)
	Grounded in S-D logic, the study examines how IT enables value co-creation in tourism.	Cabiddu et al. (2013)

Figure 3. Trans-disciplinary vectors of S-D logic diffusion (Vargo & Lusch, 2017)

2.5. Co-creation of value

In today's digital and technology oriented world, in order to cope up with dynamic market conditions and increasing competition, there is a continuous need to reinvent for all businesses (Osborne, 2018; Ateetanan & Shirahada, 2016). In recent time, world markets are becoming fragmented as consumers have extra ordinary access to modern information and networks due to advancement of technology (Baccarani & Cassia, 2017).

New ways of production and innovation have been created by modern technology and service innovations that has enhanced greater degree of collaboration and participation (Opata et al. , 2019). Basic goal of co-creation is to trigger processes of organizational knowledge by increasing involvement of customers in the creation process of meaning and value. For the creation of future value, particular aim of co-creation is transformation of customer into an "active partner" (Jaakkola, Helkkula, & Aarikka-Stenroos, 2015). Service systems always co-create value as they heavily depend on resources of other entities for their survival. This interdependence result in "service-for-service exchange and resource integration". Service-for-service can be viewed as the fundamental element of economic exchange process, and this ideology can reframe the relationship among "value-in-exchange, value-in-use and value co-creation" as shown in figure 4 (Vargo & Lusch, 2016; Vargo, Maglio, & Akaka, 2008).

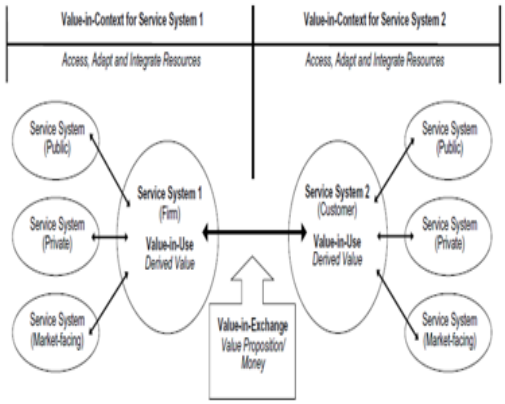


Figure 4. Value co-creation among service systems (Vargo, Maglio, & Akaka, 2008)

2.6. Why Service Innovation?

In digital and technological advanced era, service innovations are considered as a significant component in fostering economic growth of all sectors in entire world (Feser & Proeger, 2018). Customer-provider interactions can be impacted by service innovations through which improvements can be done in "experience of funding, obtaining, installing, maintaining, upgrading and disposing of products". Capabilities of organizations can be enhanced by service innovations in the process of value co-creation with stakeholders (Kauffman, Liu, & Ma, 2015). Innovations in services are majorly facilitated by Information Technology (IT) as IT improves and triggers the provision process of services (Skålén et al., 2015).

2.7. Significance and use of Information Technology (IT) as a facilitator/ driver of innovation

A significant shift of focus across socioeconomic sectors has been observed over the last decade, which is triggered by transformational improvements especially in Information Technologies (IT) (Koskela-Huotari et al., 2016). These developments are providing new opportunities for service innovations, which is a focus of study of researchers now-a-days. Across socioeconomic sectors, occurrence of service arises due to multiple intersecting trends. Due to increased living standards in developed and developing economies, demands for personal services i.e. "healthcare, education, and entertainment" are rising day-by-day (Jaakkola, Helkkula, & Aarikka-Stenroos, 2015).

Rapid and dynamic advancements in information technologies are the fundamental aspect of service innovations (Feser & Proeger, 2018). In contrast to these earlier perspectives that distinguish innovation in services industries from service innovation or innovation generally, other theorists have posited that all economic exchanges are essentially service exchanges, and that ICTs have a fundamental and transformative role as resources in service innovation (Lusch & Vargo, 2014). Whereas, modern theories highlighted that service exchange is a common denominator of all economic exchanges, and information technologies play a significant transformative role as a resource in the domain of service innovation (Lusch & Vargo, 2014; Vargo & Lusch, 2008)

2.8. Educational service systems

By considering universities as a providers of services whose particular goal is to enhance and transform knowledge of student through

multiple ways i.e. "agreements, relationships, and other exchanges among students and university faculty, including courses offered and taken, tuition paid, and work-study arrangements" (Koskela-Huotari et al., 2016).

Technically, students are not the only entity that bears complete cost of educational transformations. Rather a lot of other parties support universities in their development processes i.e. "individuals, corporations, nonprofit organizations, and government sponsors." Although this process is beneficial for all the involved parties, which result in a service equation that can be viewed as more complex than a single, unambiguous service client (Perano, Casali, & Abbate, 2018; Vargo, Wieland, & Akaka, 2015).

An excellent reputation develops for such university which is strong in almost all service relationships, "producing expected or better-than expected outcomes across the range of stakeholders", hence, getting more appreciation and acceptance high-potential students as well as employees (Skålén et al., 2015).

Now-a-days, complex relationships between both parties "service providers and clients" have been adopted by universities, moreover, IT developments and transformations have been adapted by them in how they "package, deliver, manage, and measure education" (Shiryaev et al., 2016). In recent times, services in educational world now include "remote teaching, self-paced learning, and online learning through role-playing games."

A single university cannot be considered simply a service provider, rather it is considered as a complex system of people and technologies that collaborate together to co-create value (learning). Precisely, a service system can be defined as "a value coproduction configuration of people, technology, other internal and external service systems, and shared information (such as language, processes, metrics, prices, policies, and laws)" (Koskela-Huotari et al., 2016). Individuals/entities "who exchange service with external service systems" and the global economy "which contains many internal service systems that exchange service" are considered as a special cases as most of the service systems have both internal and external structures.

2.9. Principles of Service Science

Service science (SS) is based on ten principles (Spohrer & Kwan, 2009) (see figure 5):

1. resources
2. entities
3. access rights
4. Value co-creation interactions
5. Governance interactions
6. Outcomes
7. Stakeholders
8. Measures
9. Networks
10. Ecology

SSMED Foundations	Main Focus
Resources: Everything that has a name and is useful can be viewed as a resource	Useful instruments for activities
Entities: Some complex resource configurations can initiate actions, and these are called service system entities (or just entities, or sometimes just service systems)	Openness of evolving systems
Access rights: dealing with the social norms and legal regulations associated with resource access and usage.	Supra-Systems relevance
Value Co-creation Interactions: Also known as value-proposition-based interaction mechanisms	Joint process within Service Systems
Governance Interactions: Intuitively, governance mechanisms are a type of value-proposition between an authority service system entity and a population of governed service system entities	Common finality, internal and external equilibrium
Outcomes: When service system entities interact, value-co-creation is only one of the possible outcomes.	Value intended in an extended way
Stakeholders: The four primary types of stakeholders are customer, provider, authority, and competitor	Contextual influences and self-regulation
Measures: The four primary types of measures are quality, productivity, compliance, and sustainable innovation	Up to now only qualitative
Networks: Also known as service system networks, service systems entities interact with other service system entities (normatively) via value-propositions	Networked embeddedness
Ecology: Also known as service system ecology, the macro-scale interactions of the populations of different types of service system entities	Service Ecosystems

Figure 5. Summary of Principles of Service Science (Barile & Polese, 2010)

3. Applying the Framework to IT Instructor, GCU Training Institute, Lahore and Women Trainee as Dyadic Service System

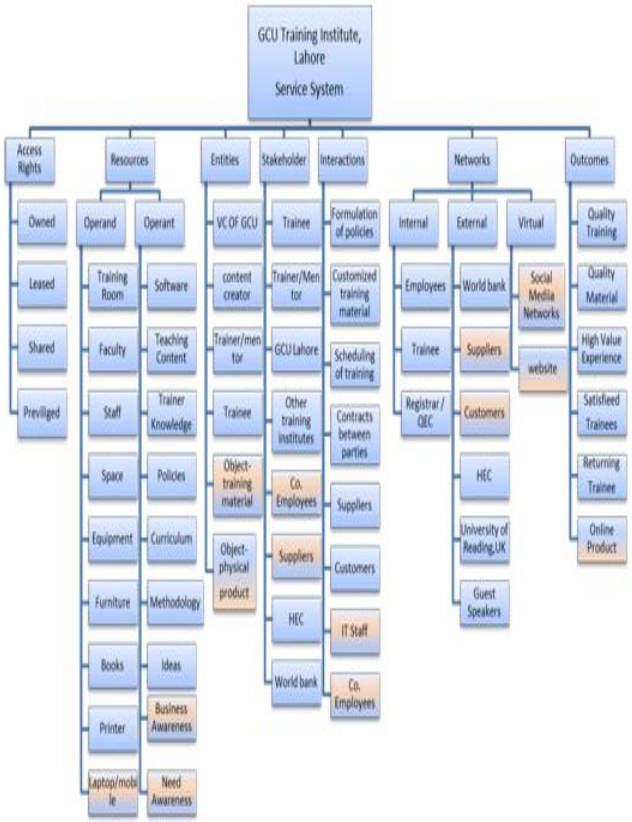


Figure 6. Proposed Dyadic Service System Framework

In this era, having multidimensional domains i.e. "business, education sector, professional training, social innovation", digital innovation can be viewed as perhaps the single most powerful force, leading towards service innovation. In present study, a service system framework and open-ended questionnaire proposed by Lyons and Tracy (2013) has been used to obtain required information, for this purpose interview has

been conducted from IT instructor, GCU training institute, Lahore and a women internee (entrepreneur) to highlight a description of dyadic relationship between two aforementioned entities (see figure 6). Particularly, Gioia methodology in qualitative approach has been used for data collection and analysis. Furthermore, convenience sampling has been used along with cross-sectional technique. To define particular boundaries of the given service system is a vital component for better understanding of phenomena. The Training Institute is located in Government College University (GCU), Lahore, headed by the Vice chancellor of the university. It is treated as a separate entity like departments of other disciplines. High-level characterization of components of both entities as a dyadic service system has been presented in table 2.

Table 2. Characterization of IT Instructor, GCU Training Institute, Lahore and Women Trainee as Dyadic Service System

Concepts	**Details of Constructs**	
Access Rights	IT Instructor	1. Owned: Furniture, equipment, projector, teaching & learning material 2. Leased: Laptops 3. Shared: GCU library, GCU computer lab, conference room, meeting room, day care center, sports facilities, cafeteria 4. Privileged: Customized training material, training methodology
	Internee	Internee avails the access rights of training institute.
Resources	IT Instructor	1. Operand: Training rooms, faculty, support staff, trainees, training center space, desk, computers, laptops/mobiles, chairs, books, microphones, LCD, white board, printer, scanner, photocopier, microwave, other related technology, note books, ball-points 2. Operant: Software, website, teaching & learning content, knowledge & experience of instructors & mentors, business ideas, policies, curriculum, teaching methodology
	Internee	1. Operant: Business awareness/knowledge of business & product, need of training awareness

Entities	IT Instructor	1. Principal: VC of GC University, Lahore 2. Producer: Publishers, content creators (instructor), support staff, coordinator, receptionist, IT technician, office boy 3. Provider: Trainer/mentor, guest speakers 4. Clients: Trainees (students), faculty, community 5. Object: Training material, customized training, guidance & counseling
	Internee	1. Principal: Women entrepreneur (Internee) 2. Provider: Women entrepreneur (Internee) 3. Clients: Customers 4. Object: Physical product (stitch/unstitch female clothes)
Stakeholders	IT Instructor	1. Customers: Trainees 2. Provider: Training center, instructor, university, publisher, mentor, support staff 3. Authority: GC University, training center, Higher Education Commission (HEC), World bank 4. Competitor: Other training institutes
	Internee	1. Customers: Customers/clients 2. Provider: Women entrepreneur (Internee), company employees, suppliers 3. Authority: Women entrepreneur (Internee) 4. Competitor: Other online clothing brands
Interactions	IT Instructor	1. Governance: Formulation & implementation of policies, planning, development and execution of training, scheduling of training delivery, faculty & staff contracts, contract between funding agency i.e. World bank and training provider i.e. GCU, Lahore 2. Value co-creation: Customized training material development, IT support service interactions
	Internee	Company employees interactions, interactions with suppliers & customers, learning value for trainee (eventually leading towards economic/ financial value for business)
	IT Instructor	1. Internal: University, instructor, trainees, supports staff, Registrar/ Quality Enhancement Cell (QEC) 2. External: World bank, HEC, other subject specialists (guest speakers), University of Reading, UK

Networks		3. Virtual: Website
	Internee	1. Internal: Company employees 2. External: suppliers, customers 3. Virtual: Social media networks (Face book page)
Outcomes	IT Instructor	High quality training delivered, quality training material produced, high value experience delivered, training objectives met, satisfied trainee, returning trainee
	Internee	Online product

3.1. Access Rights

Though access rights can be elaborated as "social norms and legal regulations" through which access and usage of particular resources in a service system can be understood (Vargo & Lusch, 2016; Barile & Polese, 2010). There are four categories of access rights i.e. "owned, leased or contracted, shared, and privileged access", and their understanding within a service system is significant. Moreover, there are multiple components which fall in these categories of access rights. For instance, in case of IT instructor Owned rights: (Furniture, equipment, projector, teaching & learning material), Leased rights: (Laptops), Shared rights: (GCU library, GCU computer lab, conference room, meeting room, day care center, sports facilities, cafeteria), and Privileged rights: (Customized training material, training methodology). Further adding to this, women internee avails the access rights of training institute of GCU, Lahore. These access rights within a service system are significant as system design can be influenced by them.

3.2 Resources

In a service system, resources play a significant role as they are considered as an essential component for the purpose of value creation. Though, people, technology and shared information are viewed as significant resources but the framework of dyadic relationship service system also revealed that training institute space and its configuration plays a significant role for the provision of training and in the interactions of IT instructor and trainees. Positioning of laptops and computers along with other physical commodities and facilitation by faculty and support staff makes a huge difference in making training a successful venture for both entities. Furthermore, Operand resources in case of IT instructor, GCU training institute are (training rooms, faculty, support staff, trainees, training center space, desk, computers, laptops/mobiles, chairs, books, microphones, LCD, white board, printer, scanner, photocopier, microwave, other related technology, note books, ball-points) and Operant resources are (software,

website, teaching & learning content, knowledge & experience of instructors & mentors, business ideas, policies, curriculum, teaching methodology). Moreover, as trainee is provided with all necessary material required for training, therefore, she does not need to carry as such physical resource with her but her operant resources are (business awareness/knowledge of business & product, need of training awareness).

3.3 Entities

Within a service system, entities can be defined as resource integrators that enable and trigger the exchange process for value co-creation purpose. It can also be elaborated as competence has been exchange by entities in a service system, which is done through certain arrangements that are determined by value propositions, which also act as a source of connection. Particularly, there are five categories of entities highlighted by Lyons and Tracy (2013) and each entity plays a significant role in service outcomes i.e. "service principal, service producer, service provider, service client or customer, and service object". In present research, our framework identified numerous entities in case of IT instructor, GCU Lahore as Principal: (VC of GC University, Lahore), Producer: (Publishers, content creators (instructor), support staff, coordinator, receptionist, IT technician, office boy), Provider: (Trainer/mentor, guest speakers), Clients: (Trainees (students), faculty, community) and Object: (Training material, customized training, guidance & counseling). Moreover, being a fashion designer, women internee runs her women clothing business online (by face book page) with only a small office setup so she would be the service principal and service provider of her business. Her customers are her clients who demand her physical products (stitch/unstitch female clothes) through her face book page.

3.4. Stakeholders

The concept of stakeholder in service science is viewed as an entity rather than a mere perspective; moreover, multiple stakeholders can be considered as an entity in a service system. In present study, dyadic service system framework identified multiple stakeholders which are involved in this study. From the perspective of IT instructor, GCU Lahore, following stakeholders have been identified such as Customers: (Trainees), Provider: (Training center, instructor, university, publisher, mentor, support staff), Authority: (GC University, training center, Higher Education Commission (HEC), World bank) and Competitor: (Other training institutes). Furthermore, in case of women internee, following are the stakeholders which are involved in this process i.e. Customers: (Customers/clients), Provider: (Women entrepreneur (Internee), company employees, suppliers), Authority: (Women Internee) and Competitor: (Other online clothing brands).

3.5. Interactions

The present study's dyadic service system framework also highlighted another significant factor i.e. way of interactions that

take place between individuals in a service system. Interactions of internees with faculty and support staff can be viewed as governance interactions through the lens of service system and its literature. IT instructor and women internee collaborate with each other for training process to co-create value through numerous ideas and service innovations which can trigger the improvement process for both entities, if implemented in an appropriate way. These interactions take place through diverse sources i.e. face-to-face, through email, social media networks, through personal phone (if instructor permits), however, value is realized when aforementioned women internee actually apply learning in business bustles that will eventually enhance her online sales. In case of IT instructor, interactions are Governance: (Formulation & implementation of policies, planning, development and execution of training, scheduling of training delivery, faculty & staff contracts, contract between funding agency i.e. World bank and training provider i.e. GCU, Lahore) and Value co-creation: (Customized training material development, IT support service interactions). In case of women internee, interactions are (Company employees interactions, interactions with suppliers & customers, learning value for trainee that eventually leading towards economic/ financial value for business).

3.6. Networks

Across service systems, value co-creation process is triggered through the existence of networks that are considered as a critical component due to multiple benefits. Formulation of networks is due to the exchange process that occurs between different entities and value propositions are basis reason of their connection. Existence of these networks can occur both internally within a service system as well as externally where they can cross system boundaries in order to connect with external sources and networks. Multiple researches also highlighted that social networks and technological networks are created between service systems due to interactions, which create grounds for a value-creating network. Multiple interactions are also identified in present study dyadic service system framework as in case of IT instructor, GCU Lahore, following networks take place i.e. Internal: (University, instructor, trainees, supports staff, Registrar/ Quality Enhancement Cell-QEC), External: (World bank, HEC, other subject specialists (guest speakers), University of Reading, UK) and Virtual: (Website). Moreover, from the perspective of women internee, following networks takes place i.e. Internal: (Company employees), External: (suppliers, customer) and Virtual: (Social media networks i.e. face book page).

3.7. Outcomes

In present research, a framework applied on dyadic service system between IT instructor, GCU Lahore and women internee revealed multiple significant outcomes, also the basic and fundamental outcome that mostly take place from service interactions is knowledge and learning. In this case, women trainee was having awareness regarding her business/ products and also regarding need

for training, therefore, by utilizing GCU training institute resources i.e. IT and other instructors, local & international guest speakers, support staff, technology, multiple knowledge outcomes have been co-created. In case of IT instructor, following outcomes are identified such as high quality training delivered, quality training material produced, high value experience delivered, training objectives met, satisfied trainee, returning trainee, and online product is the basic outcome of women internee for which she enrolled herself for customized training of GCU, Lahore to enhance sales and revenues of her product.

4. Conclusion

In service systems, lasting improvements can be created by strong foundations of service science. The basic aim of service science is to enhance understanding and configuration of service systems, as well as to apply this knowledge to advance our ability and skills to design, modify and measure service systems for practical business, educational, training and other societal purposes. The study of service systems encompasses multidimensional aspects as it is integrative, multidisciplinary undertaking, and a lot of disciplines have significant knowledge and applications to contribute in this domain.

For present research, in order to formulate a dyadic service system framework, data has been obtained from IT instructor, GCU Training institute, Lahore and a women trainee (entrepreneur/fashion designer), by adapting Lyons and Tracy (2013) service system framework and their proposed questionnaire. This work clearly demonstrates that value has been co-created in aforementioned dyadic service system as learning value for trainee has been derived through this customized training, delivered by all instructors (specially by IT instructor) , ultimately leading towards economic/financial value for business which is the ultimate goal of that trainee. In the beginning of training, she shared her training needs with IT instructor who designed customized training through training need assessment, IT instructor developed curriculum based on different business sector requirements, and delivered the training in such a format which is most suitable to the trainee. Moreover, IT covers overall business aspects, whereas other instructor would only cater their particular specialized field, that's why IT instructor has been selected because it mostly encompasses overall areas of small business. Furthermore, Results confirmed that in this digital innovation era, through use of technology and social media i.e. face book page, when women internee will apply learning i.e. obtained from training, then business revenues and online sales of her product would increase eventually. Since multiple resources, entities, stakeholders, access rights and networks are involved in formulation of dyadic service system framework; hence, the findings of present research also suggest that a symbiotic relationship exist between technology and services. In today's world, through intensive technology services, the service sector is a "producer, user and agent" of technology

that also triggers the process of development of technological innovations. In service firms, technology adoption at all levels lead towards innovations. Therefore, this study also concludes that technology plays a significant role in service innovation, which is a vital component of service dominant logic and service science.

References

Ateetanan, P., & Shirahada, K. (2016). A seamless value co-creation service roadmap of Assistive Technologies for the elderly. *In Management of Engineering and Technology (PICMET), 2016 Portland International Conference* (pp. pp. 2751-2761). IEEE.

Avny, A. (2019). Technology and society in the digital era. *Journal of Philosophy Study*, 9(4), 204-216.

Baccarani, C., & Cassia, F. (2017). Evaluating the outcomes of service ecosystems: The interplay between ecosystem well-being and customer well-being. *The TQM Journal*, 29(6), 834-846.

Barile, S., & Polese, F. (2010). Linking the viable system and many-to-many network approaches to service-dominant logic and service science. *International Journal of Quality and Service Sciences*, 2(1), 23-42.

Barile, S., & Polese, F. (2010). Smart service systems and viable service systems: Applying systems theory to service science. *Service Science*, 2(1-2), 21-40.

Barras, R. (1990). Interactive innovation in financial and business services: the vanguard of the service revolution. *Research policy*, 19(3), 215-237.

Breidbach, C. F., & Maglio, P. P. (2016). Technology-enabled value co-creation: An empirical analysis of actors, resources, and practices. *Industrial Marketing Management*, 56, 73-85.

Bryson et al. (2004). *Service Worlds: People, Organizations, and Technologies.* London: Routledge.

Cadima et al. (2016). Classroom interactions, dyadic teacher–child relationships, and self–regulation in socially disadvantaged young children. *Journal of abnormal child psychology*, 44(1), 7-17.

Evangelista et al. (2013). Business services, innovation and sectoral growth. *Structural Change and Economic Dynamics*, 25, 119–132.

Feser, D., & Proeger, T. (2018). Knowledge-Intensive Business Services as Credence Goods—a Demand-Side Approach. *Journal of the Knowledge Economy*, 9(1), 62-80.

Giddens, A. (2018). *Globalization.* Routledge.

Grönroos, C., & Gummerus, J. (2014). The service revolution and its marketing implications: service logic vs service-dominant logic. *Managing service quality*, 24(3), 206-229.

Jaakkola, E., Helkkula, A., & Aarikka-Stenroos, L. (2015). Service experience co-creation: conceptualization, implications, and

future research directions. *Journal of Service Management*, 26(2), 182-205.

Katzan, H. (2008). Foundations of Service Science concepts and facilities. *Journal of Service Science*, 1(1), 1-22.

Kauffman, R. J., Liu, J., & Ma, D. (2015). Innovations in financial IS and technology ecosystems: High-frequency trading in the equity market. *Technological Forecasting and Social Change*, 99, 339-354.

Koskela-Huotari et al. (2016). Innovation in service ecosystems—Breaking, making, and maintaining institutionalized rules of resource integration. *Journal of Business Research*, 69(8), 2964-2971.

Lusch, R. F., & Nambisan, S. (2015). Service innovation: A service-dominant logic perspective. *MIS quarterly*, 39(1).

Lusch, R. F., & Vargo, S. L. (2014). *Service-dominant logic: Premises, perspectives, possibilities.* Cambridge University Press.

Lyons, K., & Tracy, S. (2013). Characterizing organizations as service systems. *Human Factors and Ergonomics in Manufacturing & Service Industries*, 23(1), 19-27.

Maglio, P. P., Vargo, S. L., Caswell, N., & Spohrer, J. (2009). The service system is the basic abstraction of service science. *Information Systems and e-business Management*, 7(4), 395-406.

Nowick et al. (2018). Service-Dominant Logic and Performance-Based Contracting: A Systems Thinking Perspective. *Service Science*, 10(1), 12-24.

Opata et al. . (2019). Customer willingness to participate in value co-creation: The moderating effect of social ties (empirical study of automobile customers in Ghana). *Cogent Business & Management*, 6(1), 1573868.

Osborne, S. P. (2018). From public service-dominant logic to public service logic: are public service organizations capable of co-production and value co-creation? *Public Management Review*, 225-231.

Perano, M., Casali, G. L., & Abbate, T. (2018). Service Dominant Logic, Open Innovation Intermediaries and Innovative Capacities: Towards a Theoretical Framework. *International Journal of Business and Management*, 13(10).

Pohlmann, A., & Kaartemo, V. (2017). Research trajectories of Service-Dominant Logic: Emergent themes of a unifying paradigm in business and management. *Industrial Marketing Management*, 63, 53-68.

Qiu, R. G. (2009). Computational Thinking of Service Systems: Dynamics and Adaptiveness Modeling. *Service Science*, 1(1), 42-55.

Rojas Giraldo, T. (2011). *Understanding the Role of Technology in Service*

Innovation: A Theoretical Overview. Thesis.

Schulte-Pelkum et al. (2014). Dyadic trust relations between teachers and students–an empirical study about conditions and effects of perceived trustworthiness in the classroom from a differential perspective. *Beziehungen in Unterricht und Schule*, 9(5), 1-14.

Shao, B. B., & Lin, W. T. (2016). Assessing output performance of information technology service industries: Productivity, innovation and catch-up. *International Journal of Production Economics*, 172, 43-53.

Shiryaev et al. (2016). "Knowledge economy" as a resource for the intensification of socio-economic transformation of the regional economic space. *International Review of Management and Marketing*, 6(1S), 232-237.

Sjödin et al. (2020). An agile co-creation process for digital servitization: A micro-service innovation approach. *Journal of Business Research*.

Skålén et al. (2015). Exploring value propositions and service innovation: a service-dominant logic study. *Journal of the Academy of Marketing Science*, 43(2), 137-158.

Spohrer, J., & Kwan, S. K. (2009). Service Science, Management, Engineering, and Design (SSMED): An Emerging Discipline - Outline & References. *International Journal of Information Systems in the Service Sector*, 1(3), 1-3.

Spohrer, J., Anderson, L., Pass, N., & Ager, T. (2008). Service science and service-dominant logic. *In Otago Forum*, (Vol. 2, No. 2, pp. 4-18).

Spohrer, J., Vargo, S. L., Maglio, P. P., & Caswell, N. (2008). The service system is the basic abstraction of service science. *In Hawaii international conference on system sciences, proceedings of the 41st annual* (pp. (pp. 104-104)). IEEE.

Sudbury-Riley et al. (2020). The Trajectory Touchpoint Technique: A Deep Dive Methodology for Service Innovation. *Journal of Service Research*.

Vargo, S. L., & Lusch, R. (2008). Service-dominant logic: continuing the evolution. *Journal of the Academy of Marketing Science*, 36, 1-10.

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a New Dominant Logic for Marketing. *Journal of Marketing*, 68, 1-17.

Vargo, S. L., & Lusch, R. F. (2006). *The Service-Dominant Logic of Marketing: Dialog, Debate, and Directions.* Armonk: M.E. Sharpe.

Vargo, S. L., & Lusch, R. F. (2016). Institutions and axioms: an extension and update of service-dominant logic. *Journal of the Academy of Marketing Science*, 44(1), 5-23.

Vargo, S. L., & Lusch, R. F. (2017). Service-dominant logic 2025. *International Journal of Research in Marketing*, 34(1), 46-67.

Vargo, S. L., Maglio, P. P., & Akaka, M. A. (2008). On value and value co-creation: A service systems and

service logic perspective. *European management journal, 26(3)*, 26(3), 145-152.

Vargo, S. L., Wieland, H., & Akaka, M. A. (2015). Innovation through institutionalization: A service ecosystems perspective. *Industrial Marketing Management*, 44, 63-72.

Zeithaml, V. A., Parasuraman, A., & Berry, L. L. (1985). Problems and strategies in services marketing. *The Journal of Marketing*, 33-46.