



Journal of Emerging Trends in Social Sciences and Humanities

A Double-Blind, Peer-Reviewed, HEC recognized Y-category
Research Journal

E-ISSN: [3006-7898](#) P-ISSN: [3006-788X](#)

Volume 3 Issue 4, 2026, 154-171



Ecosystem Failure Archetypes and Resource Disintegration in Public Healthcare: A Constructivist Grounded Theory Study

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Article Information

Received:

2026-08-12

Revised:

2026-09-19

Accepted:

2026-10-14

Keywords

Service-Dominant Logic;
Service Failure
Archetypes; Resource
Misintegration; Public
Healthcare; Constructivist
Grounded Theory; Value
Co-destruction;
Institutional Friction.

ABSTRACT

The literature on Service Failure and Recovery (SFR) has traditionally focused on commercial, dyadic, and firm-centric perspectives on failure, all of which view failures as discrete transaction failures. Public healthcare systems, by contrast, are complex, multi-actor, and resource-constrained service systems in which failures are systemic, emergent, and profoundly influenced by institutional frictions (Vargo & Lusch, 2004, 2016; Osborne et al., 2013). This empirical study, based on service-dominant logic (SDL) and constructivist grounded theory (CGT; Charmaz, 2014), examines public healthcare service failures in District Mansehra, Pakistan. This paper uses the four primary Healthcare Complexes (District Headquarters Hospital Mansehra and Rural Health Centers Shinkari, Khaki, and Baffa) for in-depth interviews. It identifies and conceptually suggests six different types of Ecosystem Failure Archetypes, namely: (1) Displaced-Record Failure, (2) Medicine-Access Failure, (3) Authority-Queue Failure, (4) Referral-Bridge Failure, (5) Digital-Eligibility Failure, and (6) Complaint-Absorption Failure. These archetypes reflect systemic resource misintegration, institutional gatekeeping, and structural misalignment among heterogeneous actors, and differ from commercial service failures resulting from individual provider errors (Batalden et al., 2016; Plé & Chumpitaz Cáceres, 2010). The study offers a scientifically solid basis for understanding public healthcare collapses, as well as strategic policy recommendations for institutional reconfiguration and the resilience of services.



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Publisher: Institute for Educating Environmental Resilience and Governance

1. Introduction

In developing and transitional economies, public healthcare systems are under constant structural stress due to significant shortages of health care resources, a disproportionately high patient burden, and complex bureaucratic systems (World Health Organization, 2018; Kurji et al., 2016). Coordinating care delivery in these high-touch service settings is inherently complex, involving multi-actor networks of clinical providers, administrative personnel, hospital pharmacists, security personnel, digital system operators, and informal family carers (Batalden et al., 2016; Osborne, 2018). Nevertheless, competitive market positioning, customer satisfaction metrics, and standardized service quality dimensions (Parasuraman et al., 1985; Cronin & Taylor, 1992) play a central role in private healthcare literature, whereas the Public Healthcare context operates under different non-market conditions. However, if a citizen who decides to use a public hospital for his/her health care needs experiences a service failure, he/she has no opportunity to exit the market. However, when a service failure occurs at a public hospital, citizens cannot exit the market, nor can they demand immediate monetary compensation at the time of failure (Alford, 2002; Hastings, 2010). However, when services break down, their effects cascade through linked channels within institutions and cause significant physical, emotional, and economic harm to vulnerable people (Skålén et al., 2015).

Although the theoretical underpinnings in theory of Service-Dominant Logic (SDL) (Vargo & Lusch 2004, 2008, 2016; Lusch & Vargo 2014) have brought the focus from the commercial to the multi-actor resource integration process, the majority of empirical research into Service Failure and Recovery (SFR) has remained entrenched within a dyadic, commercial paradigm. Traditional models of SFR postulate well-defined organizational boundaries, formal contractual obligations, and predictable processes with monetary recovery mechanisms using service refunds or vouchers, or through an upgrade of the services (Bitner et al., 1990; Tax et al., 1998; Smith et al., 1999; and Maxham & Netemeyer, 2002). However, in public healthcare systems, service delivery is constantly interrupted by institutional frictions, medicine shortages at critical times, computer system failures, and

deeply entrenched socio-political hierarchies (Nishtar, 2010; Joosten et al., 2009; Peters et al., 2008). Citizens' legal and management capacity to seek financial remedies when public hospitals fail to provide healthcare services is limited, and the impact of value co-destruction falls entirely on them (Plé & Chumpitaz Cáceres, 2010; Echeverri & Skålén, 2011).

In addition, in the public sector, service research faces the challenge of balancing the micro level of each clinical interaction with the macro level of institutional mandates (Beirão et al., 2017; Chandler & Vargo, 2011). Frontline healthcare workers face significant moral and practical pressures, caught between a range of statutory constraints, resource levels, and patients' urgent needs (Batalden et al., 2016). Conflicting administrative procedures result in conflicts in the service when there are urgent clinical needs, and turn the opportunity for value co-creation into systemic value co-destruction, as Echeverri & Skålén (2011) and Jarvi et al. (2018) describe. Applying knowledge about how these structural misalignments lead to recurring failure patterns to understand this phenomenon extends beyond paying attention to a rather rudimentary form of customer complaint logs, thus including understanding institutional practices that impact daily delivery of public healthcare and resource integration breakdowns (Edvardsson et al., 2011; Koskela-Huotari et al., 2016).

This study aims to fill this significant theoretical and empirical lacuna by examining the organizational processes and institutional arrangements that underlie failures in public healthcare service provision (service sickness) using an in-depth qualitative methodology. This understanding is based on the fact that this paper is an empirical study located in District Mansehra, Khyber Pakhtunkhwa, Pakistan and aims at revealing the manifestation of break down in resource integration across primary care facilities including Rural Health Centre (Mansehra Shinkari, Mansehra Khaki and Mansehra Baffa) and Secondary care institutions (District Headquarter Hospital Mansehra). The main overarching research question in this article is: What specific structural archetypes arise in the context of service failure in resource-constrained

public healthcare service ecosystems, and how can institutional frictions lead to resource misintegration among different types of actors?

This research makes three basic contributions to the literature on service management, public administration, and healthcare management by answering this fundamental question. Initially, it challenges and extends beyond the dyadic, firm-centric perspective in the earlier literature on SFR, to show that situations of failure in the public health care are network disruptions of complex institutional arrangements (e.g., Koskela-Huotari et al., 2016; Edvardsson et al., 2011; Beirão et al., 2017). Second, it offers an empirically based taxonomy of six public healthcare Service Failure Archetypes: Medicine-Access Failure, Authority Queue Failure, Digital-Eligibility Failure, Complaint-Absorption Failure, Displaced-Record Failure, and Referral Bridge Failure, providing a much more detailed taxonomy of breakdowns in systemic operations. Third, it applies Service-Dominant Logic to the public sector healthcare in the Global South as a way to shed light on how unknown or unrecognized players (family carers) provide vital recovery work and maintain the networks of services which are in a state of collapse (Vargo et al., 2015; Lusch & Nambisan, 2015; Svehn et al., 2018).

2. Literature Review

2.1 The Foundations and Limitations of Traditional Service Failure and Recovery Models

The bases of theoretical concepts that underlie the concepts of Service Failure and Recovery have been mainly developed in competitive consumer-oriented service industries, such as retail banking, the hotel industry, the passenger airline sector, and the telecommunications sector (Bitner et al., 1990; Keaveney, 1995; McColl-Kennedy et al., 2003). Drawing on Oliver's (1980) work, early service scholars used the Expectancy-Disconfirmation Paradigm to define service failure as an attitude, or psychological response, resulting from a customer's perception that service performance fell below expectations. Researchers next put organizational recovery mechanisms into light of the "Justice Theory" (Tax et al., 1998; Smith et al., 1999; Blodgett et al., 1997), which suggests that there are three types of organizational recovery mechanisms: distributive justice (tangible

compensation, refunds, replacement); procedural justice (efficiency, flexibility, promptness in complaint handling); and interactional justice (carefulness, sensitivity, genuine apology, politeness from frontline representatives).

These models of SFR seem to deliver very strong actionable frameworks to a commercial enterprise trying to retain their customers and protect their brand equity (Maxham & Netemeyer, 2002; Gronroos, 2011) but in the application to public health care organizations these key theoretical assumptions are no longer valid (Osborne et al., 2013; Radnor et al., 2014). First, public health care is not subject to market conditions but to a citizen's statutory right, with the health care provider having no commercial choice (Alford, 2002; Pestoff, 2006). Second, legislation, fiscal plans, and administrative instructions at a public health facility are stringent and do not allow frontline staff to provide financial compensation or discretionary service improvements as they see fit (Brandsen & Honingh, 2016; Skálén et al., 2015). If a public hospital experiences a shortage of needed drugs or a system crash, a price not offered to the patient by the frontline worker will affect working conditions and, in turn, treatment outcomes (Batalden et al., 2016).

Third is the dyadic (two-actor) commercial SFR literature that focuses on the front-line employee of the service firm and the individual customer (Bitner et al., 1990; Keaveney, 1995). In public health care contexts, however, service encounters are necessarily network- and multi-actor-dependent (Beirão et al., 2017). In a typical patient visit, triage nurses, registration clerks, physicians, diagnostic lab techs, hospital pharmacists, digital health technicians, and family caregivers are all engaged (Batalden et al., 2016). Because a failure at any point can cause the entire care process to fail, traditional dyadic failure models are conceptually inadequate (Tax et al., 1998; Osborne et al., 2013).

2.2 Service-Dominant Logic and Value Co-Destruction in Service Ecosystems

Service-Dominant Logic (SDL) is a paradigm shift in service management that reframes value creation away from the exchange of physically discrete goods (Goods-Dominant Logic) toward integrating resources in service exchanges that provide value (Vargo & Lusch, 2004, 2008,

2016). A core tenet of SDL is the premise that value, customer value in particular, is co-created as actors engage in a minor, if not minor yet – perchance small yet – heroic struggle in the context of multi-layered webs of operant resources (backed by knowledge, clinical expertise, and social capital) and operant resources (medical devices, pharmaceuticals, digital databases) (Lusch & Nambisan, 2015; Akaka et al., 2012; Chandler & Vargo, 2011).

Following the tenets of SDL, present-day service researchers started to incorporate the notion of “value co-destruction” as a way to explain results of service interactions that result in negative outcomes for the well-being of the actors (Plé & Chumpitaz Cáceres, 2010; Echeverri & Skálén, 2011; Jarvi et al., 2018). Value co-destruction can occur when co-hosted actors misuse resources, either intentionally or because of resource-poor structures, the operations of interacting actors, or conflicting logics and cultures (Prior & Marcos-Cuevas, 2016; Chowdhury et al., 2016). In healthcare ecosystems, resource misintegration has acute consequences as the resources involved are highly specialized, cannot be substituted, and must be provided within a certain time period (Batalden et al., 2016; Svehn et al., 2018). If the critical diagnostic record is missing or primary medications are unavailable, information exchange during a service interaction is lacking, fails to generate health value, and immediately compromises patients' physical wellbeing, emotional health, and finances (Beirão et al., 2017).

To understand how resource misintegration occurs, researchers should analyze the institutional arrangements that govern how actors behave (Vargo & Lusch, 2016; Koskela-Huotari et al., 2016). Institutional arrangements include rules, norms, values, and beliefs that govern resource integration practices (Edvardsson et al., 2011). When institutional practices and rules are rigid, outdated, or conflict with operational realities, people are forced into ‘defensive’ behavior, increasing resource misintegration (Skálén et al., 2015). In one instance, hospital administrative procedures that require physical paper slips to grant entry in emergencies prioritize the administrative approach over patient survival, thereby destroying value in the system (Plé & Chumpitaz Cáceres, 2010).

2.3 Public Healthcare as a Multi-Level Complex Ecosystem

A service ecosystem is a 'a relatively self-contained, self-adjusting system of resource-integrating actors that are connected by shared institutional arrangements and through which members create value together through service exchange' (Vargo and Lusch, 2016, p.10; Lusch and Vargo, 2014). Healthcare systems are an example of quintessential complex service ecosystems that traverse micro level (physician/physician assistant/patient consultation), meso level (departmental processes or workflows inside hospital/healthcare providers), and macro level (provincial health ministry policies and national mandatory insurance provider mechanisms and frameworks) viewing dimensions (Chandler & Vargo, 2011; Beirão et al., 2017).

In developing countries like Pakistan, public healthcare systems operate amid acute institutional complexity and resource scarcity (World Bank, 2019; Nishtar, 2010). The public health system follows highly hierarchical processes, a legacy of colonial administration, overlaid with hastily introduced, disjointed digital health systems such as the social health insurance program Sehat Sahulat Card (Kurji et al., 2016; Government of Khyber Pakhtunkhwa Health Department, 2021). In this institutional nexus, service failure is not necessarily due to poor staffing. Rather, they reflect widespread systemic institutional failures, with misaligned rules, infrastructural needs, and technology failures that impede resource misintegration across the care network (Edvardsson et al., 2011; Koskela-Huotari et al., 2016; Vargo et al., 2015).

3. Research Methodology

3.1 Epistemological Stance and Grounded Theory Design

This study uses a Constructivist Grounded Theory (CGT) approach (Charmaz, 2006, 2014) to detect the complex, emergent and multi actor nature of failures of public healthcare services. CGT sits within a 'constructivist' epistemology and a 'relativist' ontology, arguing that social reality can be co-constructed through the subjective experiences, interpretations, and interactions of social actors within their structural setting (Guba

& Lincoln, 1994; Corbin & Strauss, 2008). Unlike classical Glaserian (or Straussian) grounded theory, CGT specifies the role of the researcher's interpretations, foregrounds issues of context and complexity, and aims to capture the voices of marginalized participants in the face of the institutional power structures in which they exist (Charmaz, 2014; Bryant & Charmaz, 2007).

3.2 Empirical Setting and Contextual Dynamics

Empirical field studies were conducted in public healthcare facilities in Khyber Pakhtunkhwa (KP) Province, District Mansehra, Pakistan. Given its population complexity, large geographical area spanning from urban areas to high-altitude mountain communities, and typical public health setup (Government of Khyber Pakhtunkhwa Health Department, 2021; Kurji et al., 2016), District Mansehra is an ideal empirical laboratory. The public healthcare system in District Mansehra consists of two main levels of operations:

Secondary Healthcare Facility: District Headquarter Hospital (DHQ) Mansehra, one of the major 300 beds referrals hospital serving the urban and rural community of the district offering out, in, emergency, surgical, maternal and diagnostic service.

Primary Healthcare Facilities: Rural Health Centers (RHCs) in Shunkiari, Khaki, and Baffa serve as gateway facilities, providing basic medical services, maternal services, routine diagnostics, and emergency stabilization for rural

communities.

3.3 Sampling Protocol and Data Collection Procedures

Data collection began with purposive sampling within key stakeholder groups and then moved to iterative theoretical sampling until conceptual categories emerged from the data (Charmaz, 2014; Glaser & Strauss, 1967). Theoretical sampling targeted specific participant characteristics and settings, as well as operational types, to explore and conceptually saturate (Eisenhardt, 1989; Patton, 2015) the processes of service failure.

We sampled a comprehensive cross-section of actors in the ecosystem and conducted 28 in-depth, semi-structured interviews in the field. Multiple roles in the health system were involved in the services being broken down, including patients receiving ordinary care and patients in emergencies. These family members handled patient logistics; medical doctors (consultant and medical officer), in-clinic nurses, hospital pharmacists, health ministry paper record clerks, digital health services verification personnel, senior hospital managers, and state public complaint officers. Interviews were conducted in Urdu and Pashto, lasted 45 to 90 minutes, and were audio-recorded, transcribed, and translated from Urdu and Pashto to English, with meticulous quality cross-checks. Table 1 provides the detailed demographics, professional roles, and ecosystems of all 28 participants.

Table 1: Participant Demographics, Research Setting, and Ecosystem Roles (N=28).

Participant Code	Actor Category	Facility / Location	Gender	Professional Experience / Health Status	Role in Service Ecosystem
P01	Patient	DHQ Hospital Mansehra	Male	Chronic Outpatient (Hypertension)	Navigating OPD, pharmacy, and diagnostic test queues
P02	Patient	DHQ Hospital Mansehra	Female	Maternal Care / Inpatient	Receiving maternal services and Sehat Card verification
P03	Caregiver	DHQ Hospital Mansehra	Male	Accompanying Elderly Parent	Managing patient records, medicine procurement, and logistics
P04	Patient	RHC Shinkiari	Male	Emergency Trauma Patient	Seeking primary emergency stabilization and transfer
P05	Caregiver	RHC Khaki	Female	Accompanying Pediatric Patient	Navigating primary health consultations and medicine availability
P06	Patient	RHC Baffa	Male	General Outpatient	Seeking routine diagnostic testing and general checkup
P07	Patient	DHQ Hospital Mansehra	Female	Surgical Inpatient	Undergoing elective surgery via public insurance scheme
P08	Caregiver	DHQ Hospital Mansehra	Male	AccoCaring for an ICU Patient	Managing emergency medicine procurement outside the hospital
P09	Medical Doctor	DHQ Hospital Mansehra	Male	12 Years' Experience (Senior MO)	Managing high OPD volume and clinical diagnosis
P10	Medical Doctor	RHC Shinkiari	Female	7 Years' Experience (WMO)	Providing primary maternal and emergency medical care
P11	Medical Doctor	RHC Khaki	Male	5 Years' Experience (Medical Officer)	Conducting primary outpatient clinics and triage

Participant Code	Actor Category	Facility / Location	Gender	Professional Experience / Health Status	Role in Service Ecosystem
P12	Staff Nurse	DHQ Hospital Mansehra	Female	9 Years' Experience (Charge Nurse)	Managing ward nursing, medicine administration, patient care
P13	Staff Nurse	DHQ Hospital Mansehra	Female	11 Years' Experience (Senior Nurse)	Overseeing emergency ward logistics and bed allocation
P14	Hospital Pharmacist	DHQ Hospital Mansehra	Male	8 Years' Experience (Head Pharmacist)	Managing public medicine stock, inventory, and dispensing
P15	Hospital Pharmacist	RHC Baffa	Male	4 Years' Experience (Store Incharge)	Dispensing essential public medicines and tracking shortages
P16	Record Clerk	DHQ Hospital Mansehra	Male	15 Years' Experience (MRD Clerk)	Managing manual paper registration books and patient files
P17	Record Clerk	RHC Shinkiari	Male	6 Years' Experience (OPD Registration)	Issuing manual OPD slips and managing daily patient flow
P18	Digital Health Staff	DHQ Hospital Mansehra	Male	3 Years' Experience (Sehat Card Desk)	Verifying digital insurance eligibility and biometric records
P19	Digital Health Staff	RHC Khaki	Female	2 Years' Experience (Data Entry Operator)	Entering patient data into the provincial health management system
P20	Hospital Administrator	DHQ Hospital Mansehra	Male	18 Years' Experience (Deputy MS)	Overseeing clinical operations, staff allocation, logistics
P21	Hospital Administrator	DHQ Hospital Mansehra	Male	22 Years' Experience (Medical Superintendent)	Managing facility budget, provincial ministry reporting
P22	Complaint Officer	DHQ Hospital Mansehra	Male	6 Years' Experience (In-charge Complaint)	Receiving and processing public grievances and

Participant Code	Actor Category	Facility / Location	Gender	Professional Experience / Health Status	Role in Service Ecosystem
				Cell)	complaints
P23	Patient	DHQ Hospital Mansehra	Male	Orthopedic Outpatient	Navigating X-ray diagnostics and specialist consultation
P24	Caregiver	RHC Baffa	Male	Accompanying Elderly Mother	Arranging emergency transport and acquiring prescribed drugs
P25	Medical Doctor	DHQ Hospital Mansehra	Male	14 Years' Experience (Consultant Specialist)	Managing specialized clinical interventions and referrals
P26	Staff Nurse	RHC Shinkiari	Female	6 Years' Experience (Community Nurse)	Assisting in maternal health and emergency triage
P27	Hospital Pharmacist	DHQ Hospital Mansehra	Male	5 Years' Experience (Assistant Pharmacist)	Handling pharmacy counter dispensing and inventory verification
P28	Digital Health Staff	DHQ Hospital Mansehra	Female	4 Years' Experience (Biometric Verification)	Managing digital registration glitches and CNIC verification

4. Data Analysis

The data analysis followed Charmaz's (2006, 2014) three-stage constructivist grounded theory approach to coding, involving initial line-by-line coding, Focused Coding, and Theoretical Integration, supported by highly iterative coding procedures.

Focused Coding: All codes were continuously compared within participant populations and between different facility types to see if the codes had commonality, frequency, and saliency to determine if focused codes were present (e.g., 'paper record loss and duplicate registration', 'out-of-pocket pharmaceutical cost transfer', 'rigid queue enforcement overriding medical urgency',

'uncoordinated inter-facility referral dumping'). This analysis phase reduced and synthesized the data into 18 focused coding categories.

Theoretical / Axial Integration: Integration of the focused codes was carried out employing theoretical concepts of service-dominant logic (Vargo & Lusch, 2016) and value co-destruction (Plé & Chumpitaz Cáceres, 2010; Jarvi et al., 2018). The analysis mapped interrelationships among institutional structures, resource scarcity/opportunity (operant/operam), and actors' behaviors that collectively produced different failure archetypes by structure. The qualitative coding trajectory to theoretical failure archetypes is illustrated in Table 2

Table 2: *Constructivist Grounded Theory Qualitative Coding Hierarchy and Analytical Trajectory.*

Raw Empirical Extract (Translated)	Initial Gerund Code	Focused Code Category	Emergent Failure Archetype
'I waited 3 hours in line, and when I reached the window, the clerk said my paper file from last week was lost, and I had to buy a new slip and start over.' (P01, Patient)	Losing manual patient records; forced restart of registration	Paper File Misplacement & Administrative Redundancy	1. Displaced-Record Failure
'The doctor wrote three medicines, but the hospital pharmacy counter only gave me one basic tablet. They told me the other two were out of stock and I must buy them outside.' (P03, Caregiver)	Rationing stock; transferring financial procurement burden to patient	Pharmaceutical Stock Depletion & Out-of-Pocket Transfer	2. Medicine-Access Failure
'I had an emergency chest pain referral, but the security gatekeeper and registration clerk refused to let me enter without a stamped slip from the general queue.' (P04, Patient)	Enforcing rigid entry gatekeeping; delaying urgent care triage	Bureaucratic Queue Bottleneck & Rule Inflexibility	3. Authority-Queue Failure
'The rural center sent us to DHQ in an ambulance, but when we arrived, DHQ doctors said they lacked ICU beds and sent us away without coordinating anywhere.' (P24, Caregiver)	Abandoning patient inter-facility transfer; breaking referral continuum	Inter-Facility Referral Disconnection & Responsibility Void	4. Referral-Bridge Failure
'My CNIC was registered on the Sehat Card, but the computer system kept showing 'Server Offline' for two days, blocking my emergency surgery authorization.' (P07, Patient)	Facing digital server crashes; blocking insurance service eligibility	Digital Network Outage & Biometric Mismatch	5. Digital-Eligibility Failure
'I submitted a written complaint about doctor absenteeism to the complaint box, but the clerk told me off-the-record that nobody opens that box.' (P23, Patient)	Suppressing public grievances; neutralizing institutional accountability	Grievance Suppression & Feedback Sterilization	6. Complaint-Absorption Failure

5. Empirical Results: The Six Ecosystem Failure Archetypes

The empirical results show that the lack of public healthcare services is characterized by 6 highly structured, systematic Ecosystem Failure Archetypes, presenting the absence of a single idiosyncratic operation and management failure. Each archetype corresponds to a particular affordance for interacting with resources in ways that lead to problematic outcomes amid institutional contingencies in the public healthcare sector.

5.1 Archetype 1: Displaced-Record Failure

Displaced-Record Failure is the breakdown in the structure of paper-based information management systems in public health facilities (P16, P17). Medical records, lab tests, medicine details, and patient treatment plans are kept as paper cards and bound ledgers in hospital record rooms, such as DHQ Hospital Mansehra, where these records are stored in an unorganized way.

As patient volume increases, negligence rises, and registration clerks often lose, misplace, or misfile physical cards. As a result, when chronic patients return to the health unit, they must get a new registration slip, repeat diagnostic tests, and re-explain complex clinical histories to new attending doctors (P01, P03). We register more than 1500 outpatient visitors per day in huge paper registers, as P16 (Record Clerk, DHQ) explained. After two weeks, an old patient returns and means to look for his specific file — which is physically impossible in the midst of tens of thousands of papers. We tell them, 'Please get a new five-rupee slip again, but everything they have been diagnosed with is gone. Everything they were diagnosed for is lost; we tell them, 'Please get a new five-rupee slip again.' This archetype can cause errors in information integration across the operation, redundant clinical tests, and significant administrative delays (Batalden et al., 2016).

Plus, DRF will significantly hamper clinical judgment. In crowded OPDs, doctors must make quick diagnoses and often lack baseline medical data (P09, P11). When a patient with diabetes or a patient with high blood pressure is seen without his or her chart, I am left to guess at what previous medications the patient was taking, or I have to retest the blood panels, P09 (Senior MO) pointed

out. This is a loss of valuable laboratory materials, and the treatment may be delayed for hours.” Paper records have been eliminated, and continuous care turns into separate and hazardous medical appointments (Beirão et al., 2017).

5.2 Archetype 2: Medicine-Access Failure

Medicine-Access Failure reflects pervasive failures in the public pharmaceutical supply chain in primary and secondary healthcare institutions (P14, P15). Despite government policy to provide free medicines to patients in public hospitals, stock is consistently depleted because of delayed drug allocation from provincial tenders, supplier defaulters, and mismatches in drug quotas.

During acute shortages, hospital pharmacists resort to defensive rationing (dispensing cost-cutting basic analgesics and advising patients or carers to get specialized drugs and accessories such as antibiotics, life-saving cardiovascular drugs, and surgical disposables from commercial pharmacies outside the hospital (P03, P08). P14 (Head Pharmacist, DHQ) said: 'Each quarter we have a pharmaceutical budget to be allocated and by the end of the first three weeks, we have already spent everything. We buy our stock as best we can, but have to reserve our small supply for presentations in the trauma room. In general outpatient clinics, we give out basic paracetamol tablets and, for everything else, write private prescriptions to be dispensed at local pharmacies. This failure archetype places the responsibility to integrate resources directly on patients, leading to serious out-of-pocket costs and treatment abandonment (Hastings, 2010; Skálén et al., 2015).

The repercussions of medicine-access failure extend far and wide, including reduced patient trust and compliance. Low-income patients are frequently either using smaller amounts of a medication or stopping treatment too early if they are unable to afford the private pharmacy price for the medication (P03, P05). As P05 (Caregiver) narrated: 'The hospital doctor prescribed for my child's serious case of pneumonia, but all that the hospital pharmacy could provide us was water-based syrup. I had no money to purchase antibiotics from the commercial market; I took my child home without treatment, as it costs 1200 Rupees to get the treatment. This is a clear example of health value co-destruction due to

medicine stock-outs (Plé & Chumpitaz Cáceres, 2010; Swehn et al., 2018).

5.3 Archetype 3: Authority-Queue Failure

Authority-Queue Failure results from administrative barriers, such as ignoring or refusing to follow hospital security and registration clerks/admins' queueing policies (P04, P09). In situations of "public overcrowding," an administrative role creates linear queues as a simplifying way to ensure necessary physical order.

However, this is administrative gatekeeping, with no integration of medical triage. Many patients with an acute medical emergency, severe trauma, or extreme pain may not have formal entry tokens or administrative entry-stamped slips (P04, P23) and are blocked at entry gates or registration counters. P09 (Senior Medical Officer, DHQ) noticed that: 'Registration clerks and security guards on the front line unthinkingly implement administrative policies. They do not accept a patient to the emergency without a stamped paper slip, and the patient collapses in the courtyard with chest pain. Administrative protocol completely overrides medical triage urgency.' This archetype depicts strong conflict between providing clinical services and administrative gatekeeping because of strict administrative rules and regulations (Edvardsson et al., 2011; Koskela-Huotari et al., 2016).

Administrative self-preservation is the institutional motivating force behind Authority-Queue Failure. Disciplinary action is taken against registration clerks and security personnel if registration ledgers and patient entry numbers do not match (P16, P17). That means the clerks focus more on getting procedures right than on patients' survival. I had a deep laceration on my leg and was bleeding, but the gatekeeper yelled out to my brother that he/she had to stand with the crowd of fifty people and get a 'token' before being taken to the hospital. When he did not, no one looked at my wound until my brother had to fight through the guard post and inside; this provides no system margin to smooth out the delivery of care, causing life-threatening delays in care delivery (Batalden et al., 2016).

5.4 Archetype 4: Referral-Bridge Failure

Referral-Bridge Failure is a critical defect in the

inter-facility coordination on the primary-secondary-tertiary healthcare continuum (P10, P24, P25). When primary facilities (like RHC Shinkhari or Khaki) must treat high-risk medical cases they cannot manage with their basic equipment or lack the expertise for, doctors issue paper referral slips for secondary care at DHQ Mansehra.

However, this referral bridge is a complete institutional void, with no communication systems among institutions, no real-time bed tracking, and no coordinated emergency transport. Referred patients turn up at secondary care facilities to find full wards, beds in intensive care units and, in some cases, no specialist doctors – and are then turned away and re-referred to far away tertiary centers (P24, P25). P10 (Woman Medical Officer, RHC Shinkhari) said: 'There is a problem of lack of blood transfusion facilities; we refer cases of critical bleeding of mothers to DHQ. However, when the family hires a private car and sets off an hour later, DHQ doctors tell them that there is no bed available in the hospital and the family is sent off to Abbottabad. There is no longer a referral link. Under this archetype, an operational vacuum exists in which the one-institution-one-patient-ship approach leaves no one responsible for patient survival beyond the confines of their institutions (Batalden et al., 2016).

A system-wide impact of Referral-Bridge Failure is the phenomenon of 'referral dumping', which is when overstrained secondary care hospitals hand over key patients to tertiary hospitals without clinical stabilization (P20, P25). As suggested by P25 (Consultant Specialist): 'We do not get cases from rural centers with prior phone calls; they dump the complicated cases on us. Because there are no vacancies in the ICUs, our only option is to send them back to tertiary university hospitals (Peshawar). The family is spending critical hours in ambulances stuck on the road on the mountain. This operational rupture reveals a complete lack of coordination across the service ecosystem at the meso level (Vargo & Lusch, 2016; Beirão et al., 2017).

5.5 Archetype 5: Digital-Eligibility Failure

Digital-Eligibility Failure is caused by technical issues such as network outages, database crashes, faulty BVM systems, or mismatches in digital

health policies (e.g., the Sehat Sahulat Card system) (P07, P18, P28). Although state digital health aims to make healthcare more accessible, using such health tech in resource-limited public facilities creates vulnerabilities.

If the provincial central servers are down, the internet is down in rural areas, or manual laborers (aged people) have worn-out skin on the biometric fingerprint scanner, digital operators cannot issue a Digital Authorization Code for medical admission and surgical cover (P18, P28). "But if the central database server connection fails or there is a slight spelling difference in the patient's national ID card, the computer software automatically locks for verification," told P18 (Digital Health Desk Operator). Until the digital portal eats Raspberry, we cannot approve public insurance coverage, even if a doctor asserts an urgent surgical procedure is required. This archetype shows how a digital tool adopted to deliver health services becomes an undeniable digital barrier, and how health value is lost in critical moments (Lusch & Nambisan, 2015; Akaka et al., 2012).

The inflexibility of algorithmic rules, which admit no discretion on the part of humans, further compounds Digital-Eligibility Failure. Minor data errors are fraud indicators (P28), and software systems simply have zero tolerance for administrative error. P07 (Surgical Inpatient) imparted his experience of how his wife underwent emergency gallbladder surgery on the government health card: However, as her family name in the CNIC was written as her father's name and not mine, she was denied access to the computer portal. The surgery was slated for Wednesday but was delayed by three days because it had to be performed at NADRA identity offices. Technology is not only not interchangeable across services but also a major institutional hurdle (Lusch & Nambisan, 2015).

5.6 Archetype 6: Complaint-Absorption Failure

Complaint-Absorption Failure is institutionalized grievance neutralization, suppression, and inertia

(P21, P22, P23 formal public grievance). Public health facilities have physically based grievance boxes and formal grievance desks for statutory regulatory purposes.

The advantage of these mechanisms, however, is that they are institutional 'complaint sinks' geared to absorb citizen rage without triggering administrative investigation or organizational remediation. Complaint records are rarely addressed, formal grievance committees have extremely high levels of internal bureaucratic protectionism, and complainants receive no formal response to their complaints (P22, P23). P22 (Incharge Complaint cell, DHQ) showed that when people complain about doctors' absenteeism, staff rudeness, and/or illegal fee demands, they submit a written complaint. However, it is not registered anywhere and is not discussed with the complainant. However, it is impossible to take formal disciplinary action against permanent civil service personnel in a bureaucratic way. Equal Complainant is a simple cabinet into which complaints get stashed away, and nothing changes. This archetype undermines citizens' trust and disrupts the public health ecosystem's feedback processes essential for organizational learning and recovery that is plan-driven and adaptive (Tax et al., 1998; Maxham & Netemeyer, 2002).

A neutralized structure of patient grievances, which ultimately results in hostile attitudes among patients and health care providers. Formal complaint processes are also recognized as performative and result either in passive equivocation or active physical confrontations between 'frontrunners' and citizens whose complaints have not been addressed (P03, P23). P23 (Orthopedic Outpatient) spoke out: 'Do not waste paper and time complaining to the hospital administration. The officers safeguard their employees. Shout out, and security will try to lock you up. We have learned to suffer in silence and bear our hardships. This feedback sterilization inhibits ecosystem adaptation and prevents long-term repair of public healthcare's operating mode (Tax et al., 1998; Osborne et al., 2013).

Table 3: *Comprehensive Structural Matrix of Public Healthcare Ecosystem Failure Archetypes.*

Failure Archetype	Primary Resource Breakdown	Key Ecosystem Actors Involved	Underlying Institutional Driver	Impact on Value Co-Creation
1. Displaced-Record	Misplacement/loss of paper patient files & diagnostic history	Record Clerks, OPD Doctors, Patients	Paper-based legacy archive reliance & absence of unified EMR	Forces redundant testing, erases clinical history, causes care delay
2. Medicine Access	Chronic stock-outs of essential public medicines	Hospital Pharmacists, Outpatient Doctors, Caregivers	Fiscal procurement bottlenecks & centralized stock quota limits	Transfers financial burden out-of-pocket, causing treatment abortion
3. Authority-Queue	Rigid entry gatekeeping & unyielding registration protocol	Security Staff, Registration Clerks, Emergency Doctors	Bureaucratic rule enforcement overriding clinical urgency triage	Delays critical emergency access, increases patient physiological stress
4. Referral-Bridge	Absence of inter-facility coordination & bed reservation	RHC Doctors, DHQ Specialists, Ambulance Staff, Caregivers	Inter-institutional governance void & fragmented facility linkages	Leaves patients stranded in transit, heightens mortality risks
5. Digital Eligibility	Server crashes, biometric mismatch & CNIC record errors	Digital Desk Operators, IT Admins, Surgical Patients	Fragile digital infrastructure & rigid automated rule enforcement	Blocks insurance coverage, delays time-sensitive surgical procedures
6. Complaint-Absorption	Neutralization & suppression of public grievance feedback	Complaint Officers, Hospital MS, Aggrieved Citizens	Bureaucratic self-protection & absence of accountable feedback loops	Erodes public trust, perpetuates recurring operational breakdowns

6. Discussion

The empirical results of this study will have a significant impact on the scholarly works in the field of Service Failure and Recovery (SFR) as it reframes the concept of service failures in the context of two theoretical lenses: Service-Dominant Logic (Vargo & Lusch, 2004, 2016) and Value Co-destruction (Plé & Chumpitaz Cáceres, 2010; Echeverri & Skálén, 2011). This study challenges the notion that service failures can be conceived as firm-centric failures in specific transactions embedded in service situations (Tax et al., 1998; Smith et al., 1999; Maxham & Netemeyer, 2002), as it illustrates that public healthcare service failures are actually disruptions at the network level that result from

systemic misintegration of resources and institutional friction.

First, defining the six Ecosystem Failure Archetypes challenges the dyadic, firm-centric focus that permeates many other major studies of SFR (Parasuraman et al., 1985; Cronin & Taylor, 1992; McColl-Kennedy et al., 2003). In public healthcare settings, service failures are not only related to rudeness by individual service providers or a lack of punctuality in service delivery, but also to institutional arrangements (Lusch & Vargo, 2014; Koskela-Huotari et al., 2016). Facing either Displaced-Record Failure (paper-based records are lost) or Digital-Eligibility Failure (central records servers lose their connection), frontline actors are literally hampered in effectively integrating resources. At

these times, value co-destruction isn't staff ill will, but an emergent result of structural resource scarcity and rigid administrative practices that operate at macro, meso, and micro levels (Edvardsson et al., 2011; Prior & Marcos-Cuevas, 2016; Beirão et al., 2017).

Second, the results reveal the important and yet often overlooked contribution of informal caregivers – in this case, family members – in managing the consequences of public ecosystem failure (Batalden et al., 2016; Osborne et al., 2013). In business service situations, the firm is expected to manage the situation through justice processes (Tax et al., 1998; Maxham & Netemeyer, 2002). For instance, in public healthcare systems, Medicine-Access Failure and/or Referral-Bridge Failure often lead public health facilities to surrender responsibility for recovery automatically. Family members assume the role of family caregivers and are required to fill the gap where families encounter difficulties in integrating the various resources they need; even private money and private transportation has to be found and logistics of doctors, acute or palliative care have to be managed manually; (Hastings, 2010; Skálén et al., 2015). This exposes the fact that the public healthcare "ecosystems" rely heavily on "recovery labor" provided by citizens, which, of course, goes uncompensated so as not to produce a systemic "meltdown."

Third, this study expands the theoretical scope of SDL by demonstrating value co-destruction (Lusch & Nambisan, 2015; Akaka et al., 2012) and the paradox that digital health technologies can also be a source of value co-destruction. The government Digital Health Portal aims to empower people to access health care, based on the premise that every individual, regardless of status or background, deserves it. However, algorithmic logic has created new vulnerability points (Digital-Eligibility Failure) across the entire health care journey. Without human backup systems or fallback plans, the network becomes a hard-nosed digital gatekeeper, and technology is no longer an enabler but an inhibitor that reinforces institutional friction (Beirão et al., 2017; Chandler & Vargo, 2011; Vargo et al., 2015).

Fourth, this study contributes to institutional theory in service research, as institutionalized

rules are (re)created over generations of public sector administration and form a trap that leads to similar failures again. Informal practices among staff, including complaints being 'parked' and the rationing of drugs, have become commonplace ways of coping with the lack of resources in the public healthcare system (Skálén et al., 2015). This defense mechanism reflects what is essentially the "normalization" of operational failure over time, creating a default state of "administrative inertia" in institutions (Edvardsson et al., 2011). To address this inaction, institutions must be redesigned to align with the realities of frontline resource integration (Vargo et al., 2015).

7. Strategic Policy & System Recommendations

To eliminate the systemic failure archetypes identified in this study and transition public healthcare service ecosystems toward operational resilience, healthcare administrators, provincial health ministries, and policy designers must implement ten targeted structural interventions:

1. Deployment of Hybrid Offline-Cloud Electronic Medical Records (EMR): Transition primary and secondary healthcare facilities from manual paper books to a lightweight, cloud-synced EMR platform equipped with local offline storage to eradicate Displaced-Record Failures (P16, P17).
2. Decentralized Pharmaceutical Revolving Buffer Funds: Establish local facility-level revolving drug procurement funds allowing hospital pharmacists to acquire essential medicines directly from certified local vendors during provincial supply delays (P14, P15).
3. Institutionalization of Nurse-Led Emergency Triage Desks: Implement standardized clinical triage gatekeeping at hospital entry points, replacing administrative clerks with trained triage nurses empowered to override queue protocols for acute medical emergencies (P04, P09).
4. Creation of a Real-Time Inter-Facility Referral Command Desk: Establish a centralized digital referral desk connecting primary Rural Health Centers with secondary

DHQ hospitals to verify real-time bed availability and specialist duty prior to patient transfer (P10, P24).

5. Provision of Digital Health Administrative Override Authority: Grant hospital administrative officers and medical social workers formal administrative override codes on digital health insurance portals during server crashes or biometric discrepancies (P18, P28).
6. Restructuring of Independent Grievance Audit Desks: Re-architect hospital complaint cells into independent, third-party audited patient advocacy desks required to investigate grievances and publish monthly public resolution reports (P22, P23).
7. Formal Recognition and Support Infrastructure for Caregivers: Acknowledge family caregivers as formal co-creators in the health service ecosystem by providing dedicated waiting spaces, clear navigation signage, and structured care instructions (P03, P08).
8. Multi-Actor Service-Dominant Logic Capacity Building: Conduct joint capacity-building workshops for medical, administrative, digital, and security personnel to foster a shared organizational culture of ecosystem co-creation and resource integration (Vargo et al., 2015).
9. Rural Infrastructure Redundancy Enhancements: Equip primary Rural Health Centers with solar energy generation systems and satellite internet connectivity to prevent digital portal blackouts in remote facilities (P19, P26).
10. Enactment of a Provincial Public Healthcare Service Charter: Formulate a legally binding

Public Healthcare Service Charter that defines citizen entitlements, maximum acceptable queue waiting times, and mandatory facility recovery obligations (Osborne et al., 2013).

8. Conclusion

This is an extensive and in-depth empirical and theoretical reanalysis of the concept of Service Failure and Recovery in the public healthcare industry. Drawing on Constructivist Grounded Theory and Service-Dominant Logic, the article moves beyond firm-centric and commercial models of SFR and identifies six structural Ecosystem Failure Archetypes (Displaced-Record Failure, Medicine-Access Failure, Authority-Queue Failure, Referral-Bridge Failure, Digital-Eligibility Failure, and Complaint-Absorption Failure).

In some ways, the conceptualization of these archetypes represents an effort to argue that a public healthcare failure is not simply a 'transactional failure', i.e., a one-off error in a transaction, but rather a fundamental failure within the healthcare system itself that has come from a combination of institutional 'friction', resource shortages, and top-down administrative processes. Solving these failures will be more successful with a paradigm shift from reactive/transactional (customer service failures) to proactive/structure/, ecosystem changes. With proposed policy recommendations such as hybrid EMRs, clinical triage gatekeepers, decentralized pharmaceutical funds, and digital override authorities, the public health system in developing economies can be designed to end systemic failure traps, protect vulnerable citizens, and build resilient/value creating health systems.

Conflict of Interest

The authors showed no conflict of interest.

Funding

The authors did not mention any funding for this research.

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