The Managerial and Technological Innovation in Health System

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Abstract
The invention is the first incidence of an impression for a new creation, service and process, whereas the innovation signifies placing somewhat into practice, a new way of doing things, a new value and a new application of an old concept. To be able to turn invention into innovation organizations normally need to combine several different types of knowledge, capabilities, skills and resources. For example, the introduction of a fresh technology will have need of new equipment, new skills and knowledge through learning, training and improvement along with an entire system approach to make sure a joined-up service. Innovation is the thoughtful overview and application within the products or procedures, processes, planned to benefit the individual, new to the related adoption of role, the group, society and organization. Public sector innovation correspond creativity, novelty and the intention of affecting improvement in something, for example through new or improved services and processes.

1. INTRODUCTION

Management research conducted in the 1980s and 1990s adopted New Public Management, which embraced major organizational changes to curtail hierarchical structures and apply practices followed in the private sector, such as contracting process, performance benchmarks, internal markets mechanism pressuring for innovation, and enhanced independence for senior management (Anderson & West, 1998). New Public Management approaches were considered as a solution to a supposed lack of innovation in the public sector, partly due to an aversion to risk and an anti-innovation public sector mindset, higher leaderships tendency to make top-down decisions to introduce innovations, focusing on deriving revenue from budgetary allocations rather than sales (which removes a market incentive to innovate), the need to be answerable to many constituencies and governments constraint to meet explicit moral imperatives as well as imperatives for economic efficiency (Anderson & McDaniel, 2000).

The opinion that the public sector is non-innovative due to a hostile culture to innovation, risk aversion, and a lack of incentives on innovation has persisted over time. The Oslo Manual, aimed at laying down guidelines for private sector innovations, highlighted four types of innovation in the private sector: process, product, organizational, and marketing innovations (Amabile, Schatzel, Moneta & Kramer, 2004). Currently, there is no established typology for innovation in the public-sector organizations. The relevant literature revealed the manual definitions of private-sector innovations more comprehensively, identifying process, product, organizational and communication innovations, with the latter substituting marketing innovations. Other studies include two more types; service and organizational innovation. The literature revealed the two new categories: conceptual innovation and policy innovations (Axtell, Holman & Wall, 2006).

Most of the studies listed information on the type of innovation, such as a process, service or strategic innovation; although the innovations involved „techno-logical" features. The most frequently evaluated innovation types are service innovations and process innovations. Several studies also collected data on organizational innovations, although, combined process and organizational innovations because of a concern that respondents might find it very difficult to separate the two activities (Goeschel, Wachter & Pronovost, 2010). Three studies also collected data on marketing or communication innovations, which are conceptually similar. Data on other types of innovations are collected in only one or two studies: products, strategic, systemic, and structural. None of the studies collected data on policy innovations.

2. LITERATURE REVIEW

2.1. Technological Innovation

Innovation, specifically technological innovation, is an iterative method initiated by the new market perception/new service opportunity for a technology-oriented invention leading to development, production, and marketing functions directed at achieving the commercial success of the invention. It has generally been categorized as process innovation and product innovation. The induction of new products or services in order to address customer-driven pulls in the market is called as product innovation (Becher & Chassin, 2002). The product innovation is termed as product-line extensions, new-to-the-world products, me-too products, and product modification /improvements. Contrarily, the introduction of new changes in the function of generating final products or services to enhance the efficiency of the internal process is termed as process innovation, and thus, it depends on the frequency of implementation of new technology in the firms. The relevant literature categorizes process innovation as the novelty of process technology to the world, newness of process technology

to the organization (Gardner & Avolio, 1998). Process innovation is aimed to reduce the cost related to manufacturing process and to enhance product volume. Similarly, product innovation is aimed at improving the products quality and developing new products with different features.

In accordance with, healthcare information technology is a term dealing with the application of computers systems in support of clinical and administrative work in healthcare services all over the world. Nonetheless, this revolution is not linear across the world, given the massive investment and lacking IT skills involved, particularly in developing countries. Healthcare IT has significantly contributed towards improving the cost-effectiveness, efficiency, quality and safety of medical care delivery by reducing the healthcare mistakes resulting in patient injuries and overcoming the systemic delays (Zhou & Shalley, 2008). Healthcare IT system has multidimensional benefits. "In particular, seven information based innovations in healthcare are considered to offer large potential benefits to providers and patients: e-communication between patients and providers, e-prescribing, e-records with ambulatory computerized physician order entry, e-records with inpatient computerized physician order entry, regional data-sharing, e-intensive care unit surveillance, and disease management systems" (Greendoof, 2009).

The benefits include: decreased wait time for patients; reduced error in prescriptions; reduction in the ordering of unnecessary lab tests; better monitoring of chronic illnesses; more flexible monitoring of ICU patients; reduced visits to the hospitals due to improved disease management; and improved billing (Becher & Chassin, 2002). Despite unprecedented advantages of the emerging technologies, the majority of healthcare service providers failed to adopt these technologies and continue to dispense healthcare, manage information and conduct clinical-transactions using paper-based systems. Less than 10% of hospitals make use of computerized physician order entry. "There are several causes of the reluctance of healthcare organizations to invest in innovative information services, including the lack of vendor maturity, cultural resistance, high costs, and the lack of reliable information on costs and benefits".

2.2 Managerial Innovation

Management innovation means generation and application of management structures, processes, practices, techniques or that are new to the state of the art and are intended to advance organizational goals. It entails changes in what managers do and how they do which have been debated to be very hard and ambiguous to replicate, hence most likely to help gaining sustainable competitive advantage and enhanced competitiveness. Management innovation, then, deals with changes with regards managers‟ styles to set directions, make decisions, synergize activities, and motivate people. Such changes form part of the organization as management innovation exemplifies itself through new management processes, practices, or structures. "In describing management innovation which identified four varied perspectives on management-innovation: institutional, cultural, fashion and rational perspective" (Ramamoorthy, Patrick, Slattery & Sardessai, 2005). In line with treatment of management innovation across this paper remains the rational perspective". This perspective entails that new processes, practices, or structures are purposefully introduced by key individuals within various organizations in order to further the organizational performance.

Management practices refer to what manager does as part of his job on a day-to-day basis like setting the objectives and elated procedures, organizing tasks and functions, developing talent, and meeting various demands from stakeholders. Management processes refer to the routine activities that administer the work of managers, drawing from raw ideas and turning them into practicable tools, which generally include strategic planning, performance assessment, and project management among several others. Organizational structure, means as to how organizations develop communication, and align and synergize efforts from their members (Scott & Bruce, 2004).

2.3 Technological Innovations in Health Sector

The healthcare industry is considered as complex, fragmented, turbulent, and tightly coupled. Hospital CEOs are required to be adept at leadership behaviors. Because we are concerned with IT innovations in hospitals, therefore, we will focus particular, the CIO leadership and its relationships to IT innovation. IT innovation, as described by Swanson (1994), is innovation in the organizational application of digital computer and related communications technologies." Hospital IT innovation means the implementation and application of innovative (novel to adopting organization healthcare IT for administrative or clinical tasks. Specifically, it is an integrated model that studies both the forerunners of hospital IT innovations and the impact of such innovations on performance outcomes of the hospital.

Damanpour's (1991: 561) defined innovations as, "new products/services developed to meet the demand of a consumer or the market," and the explanation made by the OECD (2004: 64) as, "the successful bringing of the new product or service to the market." Many current healthcare leaders were trained, focused on maximizing productivity through linear practices, during the period of industrial revolution aimed at yielding a proportional and predictable output. The emphasis on linear models undermined the system's capacity "to

effectively change and innovate since effective change and innovation occurs through non-linear processes, relationship-building and co-evolution".

The concept of inter-relationship, non-linearity, and co-evolution leads to positive innovation which has also been empirically validated. "When interactions and networks are detached from the system, the system gets weaker and becomes incapacitated to translate information into knowledge for change". The leaders who enable agents to develop strong and meaningful networks within the system can build organizations which can adapt, innovate, and become sustainable in a complex environment. The decline in the frequency and quality of relationships inside organization makes the organization reactive rather than proactive. The lack of inter-relationship results into reduction of information flow, poor connectivity amongst agents, and discouragement of diversity in the system and ineffective communication arrangements among others (De-Jong & Hartog, 2005). eHealth interoperability means the ability of two or more eHealth systems to interchange both human interpretable information and computer interpretable knowledge; Technical interoperability means the ability of two or more applications, to accept data from each other and perform a given task in an satisfactory and appropriate method without the need for extra operator intervention (Anderson & West, 1998).

eHealth info-structure should be assumed as the basis level covering all data structures, data interoperability and accessibility standards, ontologies, terminologies and codifications, stored data and information as well as agreements and rules for the gathering and management of these data and the tools for their exploitation. Such an info-structure, at European level, may be composed of health/medical and biomedical knowledge and research databases, data warehouses, patient and personal health records electronic systems, health education information and public health data repositories. "Electronic Health Record (EHR) means a comprehensive medical record or similar documentation of the past and present physical and mental state of health of an individual in electronic form, and providing for ready availability of these data for medical treatment and other closely related purposes" (Anderson & McDaniel, 2000).

ePrescription means an electronically issued and transmitted medicinal prescription. "Virtual Physiological Human (VPH) is a methodological and technological framework, targeting multi-scale models and simulation aiming at personalized, predictive and integrative medicine and information infrastructures". Once established, it will enable collaborative investigation of the human body as a single complex system. Personal Health Systems (PHS) assist in the provision of continuous, personalized health services and quality controlled, including treatment, diagnosis, lifestyle management disease prevention, rehabilitation and to empowered individuals irrespective of their localities. PHS consists of: body devices and intelligent ambient (implantable, portable, wearable); active feedback from health professionals, directly from the devices to the individuals and intelligent processing of the acquired information. "The innovation was realized successfully when leadership involved the organizational network rather than advocating solutions through the hierarchy" (Avolio & Howell, 1993).

2.4 Managerial Innovations in Health Sector

Avolio and Howell (1993) observed that innovation was realized successfully when leadership involved the organizational network rather than advocating solutions through the hierarchy. Insofar as Pakistan, in many public health fields, the progress has been made; though, the execution of these initiatives remains hostage to many primary social service provision snags, management and governance issues and interface predicaments, besides poor implementation of several policies, legislative and regulatory frameworks. Pakistan has introduced several reforms related to privatization and devolution and the induction of new possessions, making health reforms a feasible suggestion (Amabile, Schatzel, Moneta & Kramer, 2004). The benchmarks of health sector in Pakistan are twofold; those grounded on the medium term development framework- MTDF (2005-10) and those forming part of the millennium development goals MDGs. Theses benchmarks are centered on attaining definite program-related goals and a number of packages have been organized, toward the stride.

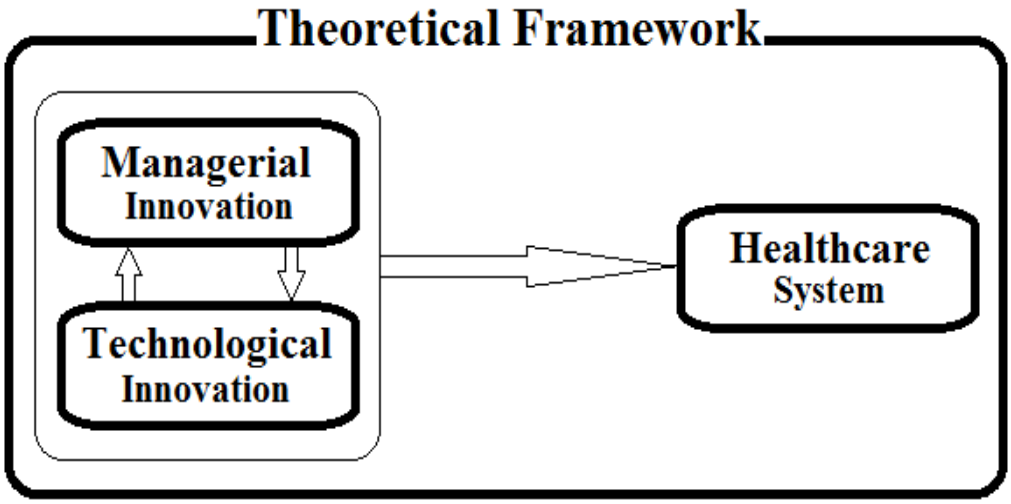
A wide spectrum of new programs, initiatives and legislative measures recently introduced at the district, provincial and federal levels demands strong health systems for their translation into action. As per Economic Survey of Pakistan (2013): "In the whole country, there are 1,096 hospitals, 5,310 dispensaries, 5,527 basic health units and 687 maternity and child health centers in Pakistan with total outlay for health sector budgeted at Rs.102.3 billion to include Rs.27.8 billion for development and Rs.74.5 billion for current expenditure which is equivalent to 0.40 percent of GDP during 2013-14 as compared to 0.35 percent in 2012-13". Several new initiatives, programs and legislative measures are being introduced at the federal, provincial and district levels aimed at efficient delivery of health services to the public (Axtell, Holman & Wall, 2006).

Hospital management is a specialized discipline entailing well-organized training and skills for hospital management professionals (Nishtar, 2006). Towards maintaining a highly qualified cadre of hospital management professionals duly trained in modern management tools, techniques and processes, post-graduate training has been introduced at the College of Physicians and Surgeons. Once trained, these physician managers are deployed at various hospitals including at district and tehsil level, which make sound decisions in

commensuration with local necessities and peculiarities. Better incentives have also been introduced for efficient health managers. Better hospital management forms part of the hospital reform process. This way government is promoting the development of better financing structures and service delivery mechanism.

At a lower level in the administrative hierarchy, several joint institutional arrangements have been established to include the District Coordination Committees, District Technical Committees and District Health Management Teams; Tehsil Committees and oversee teams etc. They are playing vital role in providing the best management to the dependent communities. Coordination system has been refined. Comprehensive Development Strategy (CDS) introduced in KP is a comprehensive policy paper focusing all dimensions including health services, predominantly communicable and non-communicable diseases let alone management in primary, secondary and tertiary healthcare systems (Burns & West, 2003).

Figure 1.1 Theoretical Framework



3. DISCUSSION

This posits that the successful implementation of information services innovations in healthcare system is very challenging, entailing not only the adequate resources, vision and commitment, but strong leadership and an enabling culture as well. MIS introduced in health system of Pakistan is also suffering from many impediments predominantly lack of expertise and interest on the part of senior or principal leadership level, despite the fact that junior medical officers are very comfortable in using such advanced health-related IT based applications. Besides, shortage of technicians and maintenance staff required to keep the modern gadgetry functional be removing faults on the spot and extending timely repair support (Anderson & West, 1998). Similarly, frequent electric breakdown and insufficient financial resources available with hospitals to manage the fuel cost for generators and non-availability of fibre-optic cable all over the country seriously impact integration of the system as a whole.

eHealth means the use of communication technologies and modern information (ICT) in support of health and health related fields to meet needs of healthcare providers, healthcare professionals, citizens, patients and the policy makers. eHealth covers the collaboration between health-service providers and patients/citizens, transmission of data from institution to institution and peer to peer communication between health professionals and citizens/patients. “eHealth solutions include products, systems and services that go beyond simply Internet based applications and encompass tools for both health authorities and professionals as well as personalized health systems for patients and citizens” (Anderson & McDaniel, 2000). Examples include electronic health records, telemedicine services, health information networks, health portals, portable communicable systems and many other ICT-based tools assisting prevention, health monitoring, treatment, lifestyle management and diagnosis.

Although considerable attention is paid towards use of Healthcare-related IT programs among healthcare practitioners, however, very limited attention has been paid towards the health management. In eHealth initiative, a duality of IT exists: firstly, general purpose applications such as databases, spreadsheets, control systems, web browsers, etc., and the secondly, field-specific application, like EMR (electronic medical records), telemedicine and CPOE (computerized patient order entry), etc. Hospital management if adopts these advanced tools and techniques, can deliver speedy, financially manageable and quality services to the dependent

communities (Amabile, Schatzel, Moneta & Kramer, 2004). Effort is not only required in technological management fields but also in human context with an aim to develop a culture where executives and staff work in harmony with shared values, beliefs and goals, jettisoning the dogmatic and authoritative approaches by instituting a culture of participatory management (Axtell, Holman & Wall, 2006).

Amongst these initiatives are KPK‟s WISHpad, health reform unit program of the Punjab government, legislation towards hospitals‟ autonomous status, the national strategy for revamping the primary healthcare system, establishment of the National Commission for oversee Career Structures of Healthcare Providers, the initiation of Continuing Medical Education (CME) system at the College of Physicians and Surgeons, establishment of institutional mechanisms such as the National Health Policy Unit; institutionalization of the public health surveillance mechanism, the donor-funded social protection strategy, investment in public health system, as in the case of blindness and hepatitis and legislation in many other sectors besides institution of several overarching systems-level reforms paying due consideration to concerned fiscal, structural, and regulatory parameters (Goeschel, Wachter & Pronovost, 2010).

4. CONCLUSION

Towards streamlining hospital management system, the government is also considering contracting “out ancillary and clinical services to individual healthcare service providers or NGOs”. Though, government will have to ensure that the interests of the poor community and vulnerable segment of the society are well-safeguarded while ensuring productive and purposeful utilization of government funds. Co-financing by community and ownership will possibly yield good results. Government is also seriously thinking on contracting out poorly managed facilities, revamping the disease-preventive and health-promoted mechanisms, transferring-out poor performers, maximizing in-system efficiencies and implementing community co-management system.

These aspects can be operationalized through five of thirteen items derived from management innovation based instrument developed from the studies to include; creation of new evaluation system in the hospital, “introduction of a new training topic or disciplines for employees in the hospital, creation of a new incentive or reward system, creation of new recruitment or employment system and creation of a new” organizational structures or shapes. One reason in particular is unique to the healthcare industry is that such systems are intended for health-care providers to offer benefits to patients and insurance companies, but not necessarily to the providers themselves. In this context, the productivity paradox is alive and well-entrenched in the healthcare field: those making use of the systems designed to improve the overall performance of the healthcare system, as a whole, may experience a decline in their own personal productivity.

Notwithstanding the fact that there has been substantial development in the healthcare industry, inefficiency continues to thrive and little effort has gone in towards understanding the measures to overcome those inefficiencies employing innovation in healthcare. A need is felt to assess the way practitioners and executives describe the term innovation in healthcare, the manner in which healthcare organizations foment innovative ideas and the techniques of innovative decisions making, the method in which healthcare practitioners and executives “roll out the innovative changes in their organizations, types of strategies these organizations apply toward the formulation of innovative decisions, the role does information technology plays in the innovative process”.

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