Design and Implementation of an Intra Public Sector Collaboration Framework using Technology

Sohail Ahmad Phatak[1], Asim Nisar[2]

[1*]Centre for Advanced Studies in Engineering (CASE), EM, Islamabad Pakistan
[2*]Centre for Advanced Studies in Engineering (CASE), EM, Islamabad Pakistan

Abstract
In this paper, a new intra sector collaboration framework is presented by extending the Bryson's framework to resolve the complex and complicated issues of intra public sector collaboration. A web-based software called Complaint Management Information System (CMIS) was designed to support the implementation of the new intra sector collaboration framework. The technology factor of the developed framework was significant regarding collaboration as it bridged the gap and established a strong link with other factors for intra sector collaboration. The proposed framework has been successfully implemented in Public Grievance Redressal Sector (PGRS) of Pakistan, which has helped in resolving the 300,000 public complaints. The disposal of grievances, within sixty days has increased from 8% to 95 % at federal level and 66% at provincial level during the years 2013-16. Transfer time of complaints has decreased from 5-15 days to 24 hours between autonomous Ombudsman Institutions, which has provided easy access to public for speedy justice. The proposed framework is found very effective and useful in selected public sector organizations of Pakistan.

Keywords:
Intra Public Sector Collaboration Framework, Intra sector Technological Collaboration, Public Sector Organizations, Complaint Management Information System (CMIS), web based software, Technology Sharing

1. Introduction

Collaboration is the process of two or more persons or organizations working together on shared common tasks (1). It effectively helps in creating solutions of complex problems (2). This is now being adopted as a new approach for the remedy of complex problems in public sector (3). It characterizes with the unit of analysis, the degree of interdependence and interaction between various organizations (4) . The synergy of the collaboration has unique advantage, which strengthens the bond between the organizations and increases partnership effectiveness (5). In promoting collaboration, the organizations achieve new solutions and goals with enhanced higher trust, intrinsic motivation and shared information (2).

Intra-public sector collaboration (business-business) is, when organizations having the same sort of core business (i.e. judiciary with its district courts and Ombudsmanship with Federal and Provincial jurisdiction) are collaborating with each other to achieve the bigger goals of the sector or to make the whole sector more efficient and effective. Whereas in cross sector collaboration, the organizations perform their core functions differently having different services (6). On the other hand, inter departmental collaboration is the coordination between the interdependent organizational units (7), whereas the intra public sector collaboration is between the independent organizations in a sector. The intra sector collaboration has significant impact on communication, situation awareness, and mental workload in aviation (8); however, intra public sector collaboration formation still needs to be further explored by research community.

Public administrators create and manage collaborations in public sector to address effectively many major problem or the challenges of the public such as economic development, poverty and complaints against government (3). The facilitation of the exchange of information in organizations, academic scholars and business practitioners have encouraged inter-departmental or intra-departmental collaboration (4; 7; 9). In 2010, Bergek and Bruzelius (4) also highlighted the importance and impact of collaboration in R&D and technological internationalizations by multinational corporations (MNCs). In collaboration, three major types of governance structures are: 1) self governing structures with collective decision-making through formal or informal, frequent interactions of members; 2) a lead organization that leads in decision-making and coordinating tasks; and 3) a network administrative organization that is a separate entity formed within the collaborating organization to perform the network activities. Dependence on factors such as size and trust among members are also key elements for this sort of collaboration (10; 11).

A number of different general frameworks and standards are available for inter-organizational collaboration which are considered to be the state of the art to the organizations such as Bryson's framework for cross- sector collaboration (9), Cisco's framework for collaboration (12) and Service Delivery Collaboration framework (13) are among others. These frameworks are generic and specific to their related field but not specific to intra-sector collaboration. Sharon S. Dawes and Ophelia Eglene (2003) developed service

Manuscript received May 5, 2017
Manuscript revised May 20, 2017

delivery collaboration framework after studying the 12 collaborations in US, Canada and Europe (13). They also discussed three types of collaboration 1) Public- Public Collaboration 2) Public-Private Collaboration 3) Public-Non Profit Collaboration but specific intra public sector collaboration was not covered as such. In 2008, Cisco published a collaboration framework (12), which is for more technology oriented organizations and did not consider the limitation definition, outcomes & accountabilities, which are required for Public value (14; 15) in public sector collaboration. Organizations get greater value of their collaboration if they go through three phases of development: investigative, performance and transformation (16). A broad schematic for e-Government and e-Business collaboration was presented in 2000 by Rogers, which simplified the mechanism of collaboration for the government (17). Bryson's framework for Cross-sector Collaboration (9) was initially presented in 2006 for cross sector collaboration understanding. The perceived base of this framework was on two general responses; i) the general belief of sector failure and ii) collaboration is always affecting the efficiency. This framework has five categories 1) initial conditions, 2) process dimensions, 3) structure and governance, 4) contingencies & constraints and 5) outcomes and accountabilities. The initial condition discussed the general environment and specific formation for collaboration. Bryson's framework has perceived initial condition of sector failure while in 2010 Felcia Brych and Francois Joanette (2010) discussed that sector failure is not always required for organizational collaboration. The process component defines the formal and informal agreement for collaboration with leadership and managing conflicts. The governance structure gives the role of organization and structural configuration in collaboration. Contingencies and constraints include the power imbalances and conflicts. The outcomes include public value and effects of collaboration and accountabilities. Later on, it was adopted for development of a geographic information system (MetroGIS) that promotes better public value in Minneapolis, USA (3). This framework was also modified and adopted by Lu Zhikui (2010) for cross-sector collaboration of E-Governance in China (18). The Bryson's framework and its extended version by Lu Zhikui discussed the cross-sector collaboration in broader spectrum but not very clearly on specifically intra-sector collaboration.

The emergence of new communication and information technologies has influenced and added the value to the processes of government collaborations. These emerging technologies open the new opportunities for the government to align their process of governance and promotion of technology-based processes. The amalgamation of these emerging technologies with Government's processes has emerged as e-Government (17). Technological collaboration is important tool for the organizations when they try to share the knowledge and information to the other organizations to achieve the same goal. Similarly, a technological collaborative initiative plays important role in firms' survival, together with subsequent need to develop inter organizational links. The technological joint ventures enable organizations to reduce downside risk while accessing upside opportunities. (19). If this collaboration is more technology oriented using web based software, then it becomes more easy and efficient. It also improves the governance of information management and record keeping. The technology improves the information sharing and governance of the collaboration in public sector (20). Furthermore, software tools like Building Information Modeling (BIM) server, provides a platform for the integration and exchange of 3D model data with embedded intelligence in the field of Architecture, Engineering, and Construction (AEC) (21). In governments, the quality of public service has been increased by using online collaborative service delivery rather than offline service delivery (22). The elements of e-collaboration are required to achieve successful collaboration in organizations (23). Information sharing in projects has important impact on decision making with its benefits of operational cost saving, better service and increased effectiveness in public sector (24).

The literature on collaboration in public sector organizations, although is wide ranging, offers little guidance for intra-public sector collaboration formation as well as technology dimension in process of collaboration (25; 9). Resources and infrastructure sharing with technology have little attracted the attention of Bryson's framework. In cross-sector, the organizational core business process is different from each other (Health and Judiciary sectors are working differently) whereas the organizational core business process is mostly same with other organizations in intra sector (Different independent courts are working on same laid down Civil Procedures Code (CPC 1908) within Justice Sector). In this scenario, the integration and re-alignment of business process works differently as of cross-sector where each sector has its own workflow process. The integration of technology is also different in both types of collaborations. Considering the importance of the collaboration between the organizations in a public sector and the role of the technology in collaboration, the Bryson's established framework is found more close to the context of this study and address needs of the intra-public sector collaboration. Therefore, it is important to adopt and extend Bryson's established framework for intra public sector collaboration by adding the factor of technology in it. Therefore, the central theme of this study is to reach at an intra public sector collaboration framework and validate it in a public sector. To meet the objective of the study, the following research question was established:

RQ1: How can intra public sector technological collaboration be implemented to make the public sector more effective and efficient?

This paper is organized in five sections. Section 2 provides the elements of collaboration and key elements of inter-organizational collaboration identified from the previous literature. Section 3 provides the research methodology. Section 4 provides the analysis of this study and section 5 provides the conclusion followed by future work and limitation sections.

2. The Elements of Collaboration and Key Elements of Organizational Collaboration

In previous literature, the different common elements of collaboration have been identified and listed in Table 1.

Table 1: Common Elements of Collaboration

Common Elements	**References**
Formal and informal Agreements between organizations	(4) (2) (13) (3)
Collaborate for common goal	(4) (3) (2) (5)
Integration of computer technology for communication and data transfer	(19) (26) (23)
Interaction and communication	(4) (26)
Sharing of resources and skills	(4) (7) (2)
Independent organizations	(4) (3) (13)

The organizations in a sector are independent organizations having the same core business and values so the elements of the collaboration are assumed having same impact as inter organizational collaboration. The key elements for organizational collaboration are identified from previous literature and presented with operational description in Table 2.

Table 2: Key Elements of Inter Organizational collaboration

Key Elements	**Operational Description**	**References**
Goals	Collaborations are done to achieve the same goals	(9) (12) (2) (13)
Initial condition	There should be initial condition on which organizations agreed for collaboration	(9)
Processes	Process of collaboration, formal and informal agreements between the organizations for collaboration	(9) (12) (2) (13)
Structure and Governance	What type of structure would be in collaboration? Who will lead? Three types of governance structures are 1)self governing structures with collective decision-making through formal or informal, frequent interactions of members; 2) a lead organization that leads in decision-making and coordinating task; and 3) a network administrative organization that is a separate entity formed within the collaborating organization to perform the network activities. It depends on factors such as size and trust among member	(9) (12) (13) (10) (11)
Constraints	Constraints and contingencies for the collaboration	(9) (13)
Outcomes	What type of outcomes are required from collaboration	(9) (27)
People and Culture	The effect of people and culture on the collaboration is included separately	(12) (13)
Technology	Use of latest technologies for collaboration i.e., software application, customized tools	(12) (28) (13)
Integration	Provide Integration of different services for effective and efficient performance	(21) (22)

The literature provides little guidance in the formation of intra sector collaboration. It is believed that the common elements of collaboration and key elements of inter organizational collaboration with redefinition have the same impact on intra sector collaboration except technology integration which aligns the organizational processes differently in intra sector where organization has mostly the same core business process.

3. Research Methodology

A research method is a strategy of the enquiry (Myers, 2008). The research artifact is iteratively developed and evaluated against its utility using design science approach (29). This study was completed in two phases. In the development phase, the conceptual framework was developed and internally validated. In the evaluation phase, the information management system was developed using the conceptual framework knowledgebase and the developed framework was externally validated, in selected public sector organizations for intra sector collaboration as discussed by Sharon and Ophelia (29). The confidence in usefulness of the framework was measured with help of developed information system by performance analysis in the selected public sector organizations.

Phase 1: The Construction of Framework: Considering the general acceptance of the needs to adopt a more comprehensive approach to study that takes the research towards the logical conclusion and solution of the issues, many frameworks have adopted the prevalent framework and extended them with additional dimensions with the nature and context of the study. The framework for performance management system was extended by Ferreira & Otley (30). Bryson's framework was modified and adopted by Lu Zhikui for cross-sector collaboration for E-Governance in China (18). This extended framework discusses the cross-sector collaboration between different local governments departments having different core business. Karacapilidis (2004) extends the framework of Herms system by providing decision-making and knowledge management features for e-collaboration (20). Mayer, 2009 adopted the Bernoulli mixture model and Vasick distribution for intra sector assets correlation (31).

The proposed new framework named as "intra public sector collaboration framework using technology", extended the Bryson's framework for Cross-sector Collaboration (Bryson et al, 2006) by additional technology factor in intra sector collaboration. The framework aims to give the administrative emphasis on technology by integrating various available technical resources and sharing of these technical skills with other dimensions of intra sector collaboration. It is believed that cross-sector collaborations are some way similar with intra sector collaboration (6) but the technology dimension works differently in intra sector collaboration as compared to cross sector collaboration. It also explores the impact of technology on other factors of collaboration. The proposed technology factor will provide a powerful means of establishing an intra sector (business-business) collaboration in a comprehensive manner.

The Phase 1 was completed in following five steps.

Step 1: We identified the common elements of collaborations and key elements of inter organizational collaboration from previous literature as shown in Table 1 and Table 2.

Step 2: We identified the most suitable established collaboration framework elements from knowledgebase for the intra-sector collaboration using the design science research (29).

Step 3: These identified elements with new intra sector elements were sent to five experts in public sector organizations to get their input and comments. The comments of experts were used to develop the conceptual framework. The wording of elements was changed, in order to get more clarity on the scope of the elements in collaboration.

Step 4: We constructed the conceptual framework by adopting and extending the established framework. The framework was developed using the knowledgebase as suggested in design science research.

Step 5: We validated the conceptual framework as discussed (32) by getting the opinion/feedback of the 40 experts from 31 different public sector organizations of Pakistan. The significance of the technology was emphasized which lead to technology integration of the PGRS sector.

Phase 2: External Validation and Implementation of Framework - Case Study Methodology: The case study research is a method of empirical enquiry (33). According to Yin (2003), in a case study, an existing phenomenon within its real-life context is investigated, especially when the boundaries between incident and context are not clearly marked. A case study also relies on various sources of evidence and benefits from the previous development of theoretical guidelines to data collection and analysis.

Information system development: in design science research, information systems are developed using the developed framework according to business needs that applies in the real life case study (29). The information system was build using the proposed conceptual framework and to meet technology requirement in framework for integration of the intra sector organizations in selected public sector. Various researchers argue that case study research method is more appropriate to conduct information system research (34; 35). Generally, it is not easy to disengage the technology collaboration from its environment i.e. public sector organizations (28). Therefore, case study research method was mainly used in this study to validate the results. It is also used to evaluate the technology collaboration framework in the real business settings of intra public sector organizations. Moreover, explorative case study was used due to the exploratory nature of research with AS-IS model process analysis. AS-IS model process is the best way to look into the existing business process of the organization. It has significant role in Business Process Re-engineering (BPR) (36). This model uncovers the unaligned and irregular processes. The public sector of grievance redressal in Pakistan was selected as a case. The Public Grievance Redressal Sector (PGRS) is also called Ombudsmanship. In PGRS of Pakistan, the autonomous Ombudsman offices are working at federal and provincial level. These Ombudsmen have the functional independence in complaints handling. For the implementation of the collaboration framework in PGRS of Pakistan, the following steps were taken:

Step 1: Formal and informal negotiation meetings with intra sector organizations were done to develop the consensus for the collaboration.

Step 2: Identification of the collaboration related problems using personal visits, meetings with concerned officers and by analysis of different official documents, circulars, regulations, reports and Laws. The systemic approach was also applied as reported in (37)

Step 3: Analysis of the modalities of these identified problems was done in step 3. These identified problems were then presented to the organizations to develop consensus on the benchmarking the unaligned processes.
Step 4: The optimized process was designed for core business process acceptable for the collaborating organizations.
Step 5: The fast and open communication mechanism is essential for organizations to synchronize with each other (38). The information system was build using the proposed conceptual framework and identified resources, to meet technology requirement in framework for integration of the intra sector organizations in PGRS. Web-based software was developed to meet the effective communication among the Ombudsmen in PGRS and data collection of complaints.
Step 6: Formal requests and approvals for the implementation of the collaboration were sorted. After the assessment of the internal teams, the organizations finally awarded the permission for implementation of the collaboration framework
Step 7: Benchmarking of the pre-implementation state of intra sector organization was done in step 7.
Step 8: The implementation of the framework was done and evidences were collected.
Step 9: The collaboration was observed for two years and data of complaints was collected to measure the usefulness of the collaboration.
Step 10: The post implementation results were compiled.
Some of the steps were performed in parallel to eliminate the delays i.e. software development, formal agreements etc.

4. Results

4.1 Phase 1: Conceptual Framework Development

Considering the key elements of inter-organizational collaboration presented in Table 2, the most suitable established framework of the Bryson et al (9) was selected. As discussed in first section, Bryson et al presents framework for understanding cross sector collaboration, which includes 1) Initial conditions, 2) Process, 3) Governance structure, 4) Contingencies and constraints, 5) Outcomes. The Bryson framework did not consider the intra sector collaboration whereas the organizations are independent whether in cross-sector or within the sector. The core process is different in cross-sector while this is mostly same within sector, which may be adopted as it is within sector. The proposed collaboration framework redefined the five factors of Bryson's framework and extended the framework with additional dimension of technology according to the context of this research study for the intra sector collaboration as shown in Figure 1. Initial condition includes the benchmarking and the adoption of the best practices available in the environment. The technology component includes sharing of resources, technology infrastructure and web software for communication and information exchange. Structure of the government describes the type of the governance structure and who will lead the collaboration. Process component will manage the formal and informal agreements and powers. Constraints will take care of the power imbalances in collaboration. Outcomes and accountability will monitor the results of the collaboration. The use of ICT affects the process and governance structure of collaboration (18).

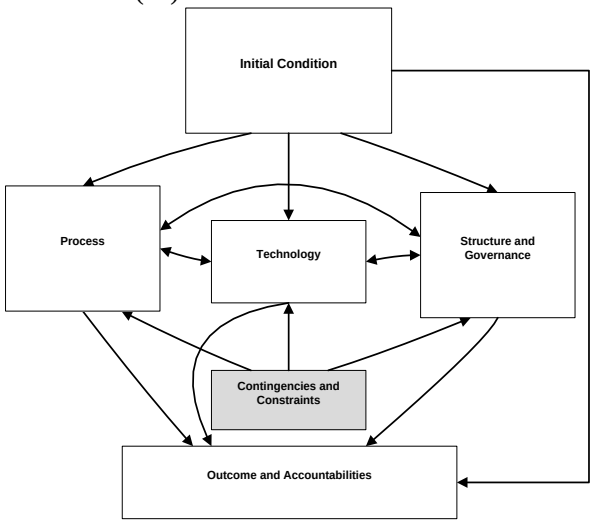

Figure 1: Theoretical Intra Public Sector Collaboration Framework for Organizations in Public Sector

Structural Validation of Framework- Feedback and Opinion of Experts

After completing the construction of the proposed collaboration framework, it was reviewed and revised by experts, through a particular process of discussions and meetings (32). By incorporating the opinions and feedbacks from experts, having divergent point of view, the proposed framework was further refined for accuracy and correctness. Furthermore, different meetings along with one-day workshop was arranged, in which the author presented the proposed collaboration. The components of collaboration in public sector were discussed and reviewed with 40 participants from public sectors (28 different Ministries and departments of Pakistan and 3 Foreign Organizations) including Federal Secretaries, Chief Justice High Court, Additional Secretaries, Director Generals, Directors, Advisors, Consultant and Technology Experts, who shared their useful knowledge and experience. Their emphasis was on technology and accommodation of the poor organizations of the sector in collaboration. At the end of the last session, the elaborated framework was presented to participants (experts) on screen. The sub items were adjusted with consensus of the participants for more elaboration of the main factors. The

elaborated collaboration framework is presented in Figure 2. The details are discussed as follows:

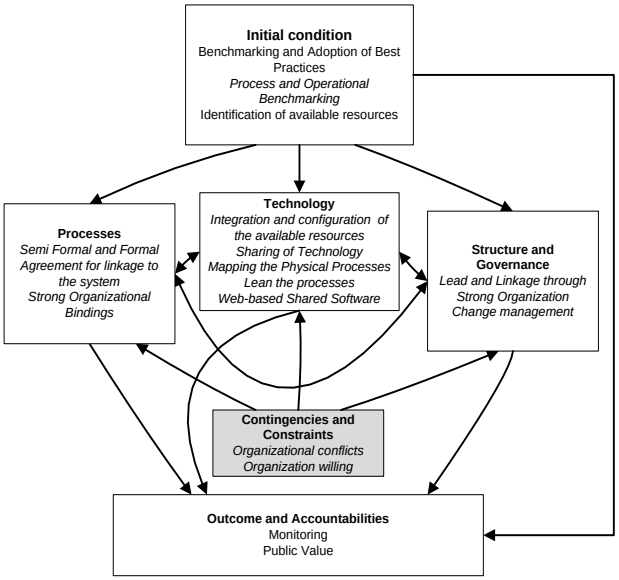

Figure 2: Elaborated Intra Sector Collaboration Framework for Organizations in a Public Sector

4.1.1 Initial Condition

Inter-organizational collaboration, supported by interagency systems must accommodate the external factors that affect the formation of collaboration within a sector. These factors either can facilitate or hinder the intra-sector collaboration within the environment. The initial conditions also focus on general environment in which intra-sector collaboration is embedded. The Sector failure may be the precondition for collaboration as discussed by Bryson (9) but it is not always required for sector collaboration (16; 18). The precondition for intra sector collaboration is to improve public service delivery by specific sector i.e. healthcare and judiciary.

4.1.1.1 Benchmarking and Adoption of Best practices

Benchmarking and adoption of best practices improve the performance of the public sector. It also helps to compare the performances in the sector (39; 40). Adoption of best process of a organization in a sector will help to improve the performance and operation of the weaker organizations which will create the public value (15).

4.1.1.2 Process and Operational Benchmarking

Optimal process of the best performing organization in sector can be adopted in both core process and operation of weaker organization (40). Benchmarking will also lead the formation of the collaboration in term of technology selection, process of joining the collaboration and leading role in governance and structure of the collaboration.

4.1.1.3 Identification of Available Resources

Public administrators share the available resource of the public sector to perform the specific tasks effectively (3). The identification of the available resources is important, as it will determine the cost of the collaboration. Higher the use of the available resources will lesser the initial cost of collaboration in term of technology adoption i.e. ICT infrastructure (18).

4.1.2 Technology

Technology has made the life of people easy through quick access to the required information. It is the technology, which has aligned the processes of the organization with its aims and objectives. The technology always influences the performance of the organizations (17). There is always need for a protocol/system which can perform core business of an organization whether this organization is government or private. These protocols are more aligned and standardized in technology format (22). One of the key challenges for public sector is to address and identify hindrances in the usage of ICT in public sector ((18). The technology integration in intra sector collaboration will also enhance the usage of the ICT in public sector. Technology has most important role in intra sector technological collaboration. Whereas Human resource and culture of the organization has key role in adoption of technology (12). Technology factor derive the collaboration process and governance structure which then leads to accountabilities and outcomes of the collaboration. The process is dependent on the role of technology, which is considered in sector collaboration (18). For single shared system both process and structure is different from the cross sector collaboration. The hosting of ICT infrastructure will define the role of the organizations in collaboration.

4.1.2.1 Integration of the Available Resources

To enhance the efficiency and performance of a sector, the integration of the available resources is importation (19). It will reduce the initial cost of technology adoption within a sector.

4.1.2.2. Sharing of Technology

Sharing of technology will help in technology adoption for those organizations, which are lacking in technology budget (19). Sharing will also help poor organizations in the sector.

4.1.2.3. Mapping the Physical Process and Lean the Processes

Technology will help to attain the optimized process model for the sector. Mapping of the physical process to optimized process is important to get full benefits of the technology (17). It will also lean the workflow processes within sector and enhance the performance of the sector.

4.1.2.4..Web-Based Software

Web based software is one of the easy and manageable solution for technological collaboration in public sector (20).Software tools like Building Information Modeling (BIM) server, provides a platform for the integration and exchange of 3D model data with embedded intelligence in the field of Architecture, Engineering, and Construction (AEC) (21). Software aligns the processes efficiently and affects the output. Web Software helps in collaboration at process layer and enhances the efficiency of the system in collaborating sides (20; 21). In government organization, bureaucracy has adopted its own style of working. They are more focused on the tangible output before any agreement; due to bureaucratic style of agreement; web software provided the tangible output testing tool, which created the baseline for this technology sharing. The software will be installed in Government owned data center and shared in whole sector. The software will gradually provide the confidence in usefulness of the collaboration. In view of intra sector collaboration, people and prevalent culture have significant role in outcomes of system (12). Initially the organizations may be reluctant to spare and share their resources, which may delay the process of collaboration so a resource sharing agreement between the organizations within a sector is important and will be carried out.

4.1.3 Processes

Process of collaboration in intra sector collaboration has a key role. It define how the collaborating organizations will work together in future and who will lead (9). Initial agreements have most important impact on the outcomes (18). The strong initial formulation will affect mechanism of collaboration (41). The strong organizational binding will expedite the whole process of collaboration. The agreement for use of shared ICT resources is important for governmental service delivery (18). The Technology factor will impact on process of collaboration and drive the terms of agreement, how will share the technology and where the IT infrastructure will be placed, what will be the share of organization in recurring and maintenance cost of the technology.

4.1.4 Governance Structure

Governance structure is a highly developed concept and includes elements like management team, task division, authority to lead and standard operating procedures. It also includes the vertical and horizontal components (42; 43). Formal and informal governance mechanism is more likely to affect the collaboration effectiveness (41; 44)
For collaborations, Provan & Kenis (2005, 2007) have presented three major types of governance structures. These are 1) self governing structures with collective decision-making through formal or informal, frequent interactions of members; 2) a lead organization that leads in decision-making and coordinating task; and 3) a network administrative organization that is a separate entity formed within the collaborating organization to perform the network activities. It depends on factors such as size and trust among members (10; 11). The intra sector collaboration is most likely to succeed if it has effective leading organization and autonomy of the stakeholders could not be compromised, whether it is virtual or physical (41; 3). Intra sector organizational structure is important for organizations to resolve the issues and differences amicably (18). The technology factor also impacts the governance structure, generally the organization that bear the cost of development and hosting of the software will emerge as leading organization. The weaker organizations are lead by this stronger organization.

4.1.5 Limitation and Constraints on Collaboration

Generally, there are often potential obstacles those may limit the collaboration (9; 18). Organization willingness to join the collaboration and organization conflicts may also affect the collaboration.

4.1.6 Outcome, Benefits and Accountabilities

We discuss outcomes in two categories 1) monitoring and 2) public value

4.1.6.1 Monitoring

The monitoring of the performance of stakeholders is the important feature of the collaboration (9). In this intra sector collaboration, physical processes will be monitored by use of technology (18). The web-based software will provide strong monitoring and control to the organizations. The monitoring by using technology has improved the public service delivery (37). Strong monitoring will encourage the same and optimized core process for whole public sector.

4.1.6.2 Public Value

Moore discussed that public value cannot be created by single organization in a sector (14). It is most likely to be created by collaboration between different organizations in that public sector for the sake of public interest (14; 15). Logically public value seems connected to manage the costs effectively, resources, delays, and meeting to diverse human needs by playing with the strengths of strong organization and minimizing the weaknesses of weak organizations.

4.2. Phase 2: Implementation Phase - Case Study Analysis and Discussion

4.2.1 Introduction of Case

We selected public sector organizations of Pakistan, which deal with the public complaints against mal-administration of the government agencies and part of the Public Grievance Redressal System (PGRS). The federal and provincial Ombudsman offices in PGRS of Pakistan were selected for the implementation of the framework.

4.2.2 Pre Implementation Problems in PGRS

The organizations were experiencing a number of inherited issues regarding the delays and inefficiency in the disposal of grievances of public against the conduct of the government agencies. First, there was problem of isolated system of Redressal in all ombudsman offices in PGRS. Second, limited use of modern technologies in PGRS was affecting their efficiency. Third, contribution of time factor attributed to complaint referral system was delaying the redressal of complaints. Fourth problem was more time taken in registration process of complaints. Fifth problem was, delayed disposal of complaints (45). The data of 70,000 complaints was analyzed and it was found; 1) The average time between complaint receipt and registration was 4-5 days; 2) The average time to refer a complaint to other ombudsman was 14-15 days depending upon the numbers of complaints received. It was observed that 90% of complaints were pending for more than one year. Three Ombudsman offices were selected for framework implementation and validation.

4.2.3 Information System Development - Web-based Software

A web-based software CMIS (Complaint Management Information System) was developed for effective and efficient intra sector collaboration in PGRS. It helped to maintain the enhanced data flow, storage in processes and online public service delivery to offline service delivery. The software was designed in N-tier architectural design with Microsoft technologies i.e. dot net and SQL Server.

4.2.4. The Glimpses of CMIS

The CMIS was developed and implemented to support the implementation of the intra sector collaboration framework. The important features of CMIS are given below

- It provided fully developed computerized complaint/data management
- Digitally standardized processes
- Powerful Monitoring and Evaluation (M&E) Dashboard
- Use of online system for:
  - Complaint Registration
  - Complaint Status Tracking
  - Web-publication of daily hearings list on website
- Keeping the complainant informed by sending SMS on:
  - Admission and registration
  - Date of hearing
  - Date of adjournment, if any

The functioning of CMIS, which connected the independent and autonomous Ombudsman offices in PGRS of Pakistan, is shown in Figure 3.

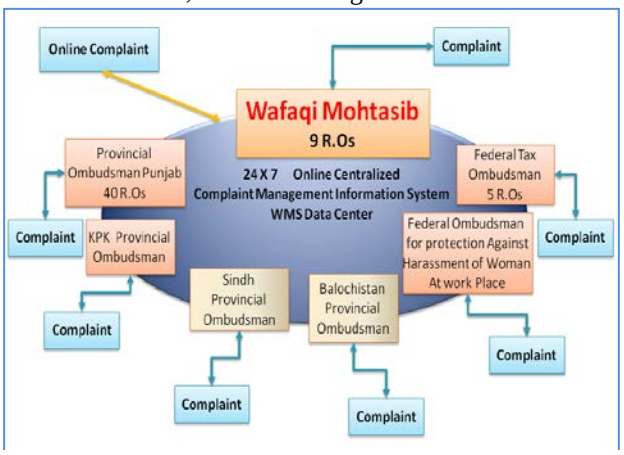

Figure 3: Functioning of the CMIS in PGRS

4.2.5 Analysis and Discussion

Based on the steps discussed above the documents were recorded for every factor of collaboration. The collaboration framework for PGRS is shown in Figure 4

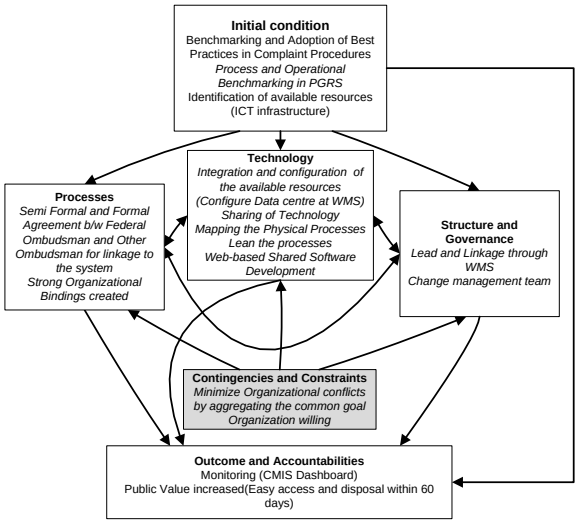

Figure 4: Intra Sector Collaboration Framework for PGRS

4.2.5.1 Initial Conditions: Benchmarking and Adoption of the Best Practices

The Ombudsman offices were working in isolation and nothing was shared regarding the grievance redressal. The level of technology usage in Ombudsman was uneven and mostly limited to typing work. The Ombudsmen offices had limited technology infrastructure whereas the competent authority was required to allocate funds, which were limited. The Procedures of complaints handling were compared with the optimal procedures for disposal of complaints, which were benchmarked in Ombudsmen offices, which possess the optimal environment for framework implementation. After the establishment of the new subsequent ombudsmen in Pakistan, some of the ombudsmen leaned and enhanced their procedures of complaint handling while others were still entangled in old procedures and lagging behind the main spirit of the PGRS. It was observed, that the complaint process was mostly the same in different Ombudsman offices but handling was different. They had to upgrade the process of complaint handling either by up-gradation or by adoption and benchmarking the available best handling system to eliminate the procedural delays in handling of complaints. Initially, the Ombudsman institutions in Pakistan adopted the law and benchmarked the procedures of complaint handling of Federal Ombudsman (46). The Ombudsman institutions can perform more efficiently if they collaborate and adopt the established best practices. They may effectively perform their complaint handling also (47). The Policy Makers in these institutions believe that complaint-handling system can be adopted in public interest to achieve good governance (48; 41). In PGRS of Pakistan, Federal Ombudsman had the best and efficient system for linkage and benchmarking at the time of their initial linkage formation. In PGRS of Pakistan, process, performance and operational benchmarking were initiated to get maximum output of this framework. The Provincial Ombudsman Punjab and Provincial Ombudsman Khyber Pakhtunkhwa then benchmarked the Federal Ombudsman in process, performance and operations. This provided optimized process of complaint handling in PGRS.

4.2.5.2 Technology

Only Federal Ombudsman had the IT equipment, which was configured to the technology infrastructure. The developed web-based software is executing on available infrastructure with shared resources within Ombudsman offices. It has aligned the process of complaint handling system, reduced the time profile of complaint, referral time and increased Ombudsmanship effectiveness for better governance. Web-based software has been developed using Microsoft .NET technologies to achieve the objective of this research study as discussed in prevous section. This software has been installed in data center of Federal Ombudsman. This software has gradually provided the confidence in usefulness of the collaboration. Initially the organizations were reluctant to spare and share their resources, which delayed the process of collaboration so a resource sharing agreement between the Ombudsman offices was carried out. Later, trained technical staff was deputed in other Ombudsmen offices, which greatly enhanced the speed of collaboration. The sharing of HR became the catalyst for this collaboration.

4.2.5.3 Processes

The collaboration process in PGRS of Pakistan started in a semiformal way, including the requests and visit of the Provincial Ombudsman, which was finally completed with formal agreements. The strong organizational binding expedited the whole process of collaboration.

4.2.5.4 Governance Structure

The semi-formal governance structure is applied where Federal Ombudsman has the leading role with the consensus of the collaborating Provincial Ombudsmen. The Federal Ombudsman office has emerged as leading organization and playing the leading role in this collaboration.

4.2.5.5 Limitation and constraints affecting the collaboration

On the surface, all the Ombudsmen are independent, autonomous, and willing to work in virtual environment; however, the successful execution is dependent on the linkage and the usage of the single shared software. Furthermore, currently only Federal Ombudsman is bearing the recurring cost that could be shared so it will

create the ownership of technology of office of other Ombudsmen. There is also the salary package difference that caused lesser sharing of the skilled human resources, within Ombudsman institutions. The personal dislikes and perception of the unemployment with use of technology were present which affected the process of collaboration significantly.

4.2.5.6 Outcome, Benefits and Accountabilities

Monitoring: The web-based software has provided strong monitoring and control to the Ombudsman on the speedy redressal of complaints. It has provided the rich dashboard for monitoring the performance of the stakeholders.

Public Value: The acquired ICT infrastructure has been used in PGRS for public value. In the collaboration, the strengths of Federal Ombudsman have been shared with weaknesses of the Provincial Ombudsman, i.e. Federal Ombudsman has well-equipped data center whereas the Provincial Ombudsman has only the computer systems. Presently the Federal and provincial Ombudsmen have the same efficient system, which has given the public value in term of easy and speedy justice.

The adoption of the best practices and benchmarking has aligned the complaint handling procedures in PGRS. It means the PGRS is working on the unified process for complaint handling. This has the impact on technology adoption, process of collaboration and governance structure. It also has created direct impact on the outcome by removing the irregularities in process. Adoption has eased the technology acquisition by decreasing information system development cost and efforts for each organization. This has provided good environment for intra sector collaboration. The weak organization obviously accepted the leadership of strong Federal Ombudsman in governance structure by adopting and benchmarking, which created the processes more strong with formal agreement in PGRS. Technology has provided the bridge between the other dimensions of collaboration framework, and also has provided the digitized unidirectional procedures of complaint handling. This helped in creating strong bindings and ownership of the organization by using the same information system and IT infrastructure. It enhanced the role of organizations in governance of the collaboration and also in sector. The dependence of the organizations on technology has created a multiplier significant impact on other factors of collaboration i.e. Created the strong binding in processes by formal agreements and accepting the role of Federal Ombudsman, which is hosting the technology in its premises. Technology also provided transparency in performing the core activity of complaint disposal using information management system. The dependence of PGRS on technology has increased the usage of ICT, transparency, public value by proving check and balance in routine activities of the sector.

4.2.6 Performance Validity: Confidence in the Usefulness of the Framework

Building confidence in usefulness is gradual process of relativist validation (49). The implementation/validation of this framework took two years and was further observed for six months for the results. Currently, complaint-handling process is less time consuming, transparent and complainant friendly. The first response to complainant is issued within 24 hours after the complaint registration whereas it took four to five days before this collaboration. Both processing and operational benchmarking was done in all Ombudsmen in Pakistan. This framework has provided the platform to benchmark new improved processes and procedures of complaint handling with use of technology in PGRS.

This intra sector collaboration has been evolved into web-based software called Complaint Management Information System (CMIS) for PGRS of Pakistan. This web-based software has been developed for complaint workflow management. Federal and provincial Ombudsmen have adopted this software for their complaint handling. At present, every Ombudsman has his virtual office on CMIS. It enabled single service in PGRS to response and redressal of complaint. This web-based software has provided online complaint registration form and it is available to every Ombudsman's website. Complainant may lodge complaint to any Ombudsmen from any website. This collaboration has integrated the available resources for bigger goal of redressal free of cost and made millions of investment into useful dynamic joint venture by integration of the available resources. The Provincial Ombudsmen are benefiting from the CMIS due to its cost effectiveness and unique features as: 1) no running cost of the CMIS; 2) save time of software development; 3) saved initial cost of Rs. 20 million, which would have been incurred on development and establishment of datacenter 4) free of cost trainings in operating CMIS.

Further, the usefulness of the framework was measured by evaluating the performance (complaint handling) of the collaborating organizations using the developed CMIS. The empirical data analysis was also done on the bases of how well the sector is performing after the collaboration meaning thereby how efficiently they are performing the core business of complaint handling. The performance of the collaboration was calculated by measuring the time profile of disposal of complaints and time profile of referral of complaints. Only 301,256 complaints were compiled and analyzed for this study. The Federal Ombudsman handled 254,000 whereas 47,256 complaints were handled in provincial Ombudsmen as shown in Figure 5.

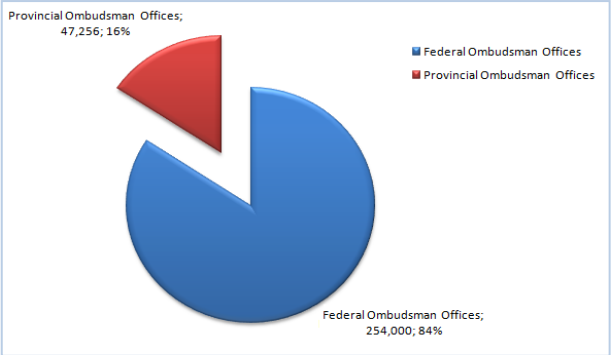

Figure 5: Total Workload of Complaints

The time profile of complaint was calculated using the construct below in Figure 6. The data of complaint was stored in database of developed software.

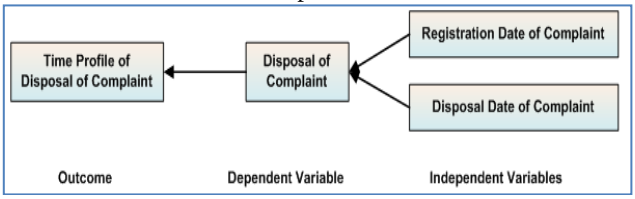

Figure 6: Theoretical Construct for Calculation of the Time Profile of Disposal of Complaints

The impact of the intra sector collaboration is shown in Figure 7 and 8, displaying the time profile of the disposal of complaint in Federal Ombudsman and Provincial Ombudsman Punjab. Disposal of complaint within 60 days has been increased from 8% (2013) to 95% (2016) in Federal Ombudsman and 57% (2014) to 66%(2016) in Provincial Ombudsman Punjab. The 57% (2014) disposal of complaints is only achieved by the collaboration and aligned processes of complaint handling in Ombudsman Punjab which was significantly less in previous years. This has been achieved with the strong monitoring and evaluation system introduced in CMIS and its sharing within Ombudsmen in PGRS of Pakistan.

Year	Within 60 Days	Within 2-5Months	Within 6-12Months	More than Year	Total
2013	6,483	1,671	11,826	54,717	74,697
	8%	2%	15%	73%	
2014	11,914	14,642	30,497	20,113	77,166
	15%	18%	39%	26%	
2015	42,278	12,816	490	98	55,682
	75%	23%	0%	0%	
2016	65,333	3,304	67	7	68,711
	95%	4%	0%	0%	
Total	126,008	32,433	42,880	74,935	276,256
	45%	11%	15%	27%	100%

Figure 7: Time Profile of Federal Ombudsman (Source CMIS)

Year	Within 60 Days	Within 2-5Months	Within 6-12Months	More than Year	Total
2014	4,112	2,991	46	0	7,149
	57%	41%	0%	0%	
2015	15,702	6,158	2,193	193	24,246
	64%	25%	9%	0%	
2016	10,806	3,555	1,420	365	16,146
	66%	22%	8%	2%	
Total	30,620	12,704	3,659	558	47,541
	64%	26%	7%	1%	100%

Figure 8: Time Profile of Ombudsman Punjab (Source CMIS)

Now the complaints are transferred online to other Ombudsmen, who take the action on complaint on the same day. Time profile of referral of complaint is calculated using the construct below in Figure 9. All the real time data of transferred complaints is collected in database of the developed software. This module is yet little in use due to limited available scanners. It is believed it will be increased with the availability of scanners and with practice of system. The sample size of 2000 complaints is analyzed.

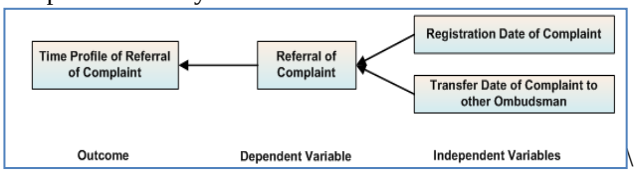

Figure 9: Theoretical Construct for calculation of Time Profile of Referral of Complaints

Now the average time of referral is 24 hours (source CMIS) and the first action starts on the same day, which was consuming 14-15 days previously before the collaboration. It has increased the public trust on Ombudsmanship by decreasing the uncertainty about the action on the complaint. The Ombudsmen are inter-connected online through integrated software, which generate the unique complaint number, it remain same until the disposal of complaint. This collaboration has decreased the time profile of the referral from 5-15 days to just 24 hours as shown in Figure 10.

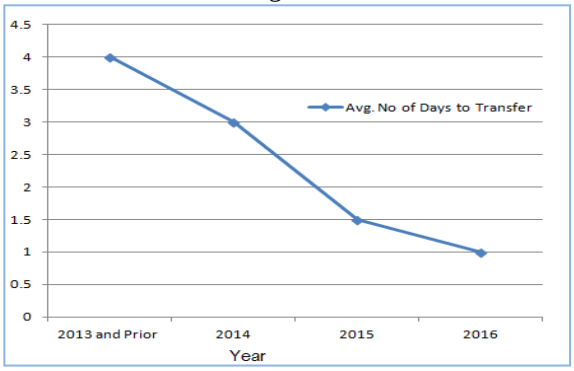

Figure 10: Time Profile of Referral of Complaints

5. Conclusion

The collaboration is important in public sector organizations (50) and different collaboration frameworks have been developed and implemented to meet the needs of collaborations. The intra sector collaboration framework was designed and implements in PGRS of Pakistan, which provided good results. Technology is important in intra sector collaboration with other factors of collaboration. Without technology integration, the performance of the sector will remain under question. So performance of a sector can be achieved by integration of available resources, benchmarking the best practices and reconfiguring these available resources for bigger goal of the sector. The technology factor in collaboration not only reduced the cost but also re-aligned the core process of a public sector in one direction. The technological collaboration in a sector also saved the time and investment in re-invention of the wheel. It helped to minimize the problems identified before collaboration and helped to resolve 200,000 complaints during the years 2013-15 in PGRS of Pakistan. This case study has provided the platform to the Ombudsmen in PGRS for technologies adoption, where the weaknesses of Ombudsmanship are replaced with the emergence of stronger Ombudsman. Technology has aligned the process of complaint handling in PGRS. The intra sector technological collaboration has improved the public value in terms of public trust on PGRS and easy and multiple access for public in different organization having the same core business. The intra sector collaboration is more organized, more result oriented and effective, if it is technology based i.e. single shared software. The sharing of knowledge, adoption of established best practices and technological collaboration has enabled more effective Ombudsmanship, which gives prompt complaint redressal. This intra sector collaboration has enabled the PGRS of Pakistan to be more effective towards the speedy justice to the public. This framework has provided the theoretical background and defined the protocols for the networking of the Ombudsmen, which may also be used in other sectors. It has provided the cohesiveness and synergy in PGRS of Pakistan by the adoption and sharing of unidirectional system. It has provided the virtual Ombudsmanship in Pakistan. The disposal of complaints within sixty days has been significantly increased and referral time of complaints among the Ombudsmen has decreased significantly. The cost (time, money and efforts) of shared system is much less as compared to the isolated system for each Ombudsman. The sharing of the resources has saved Rs. 50 Million and reduced the recurring cost, etc. It has also started monthly savings of Rs. 0.4 Million of the Provincial Ombudsman Punjab. The intra sector collaboration is the best choice to improve the performance and effectiveness of the sector, which also saves the establishment and operational cost of a public sector.

6. Future work

This framework was implemented in a public sector where independent organizations are providing the grievance redressal, free of cost. This framework may be implemented in a commercial service provider public sector. It is believed that the political power has impact on intra sector collaboration, which was not explored. These political power imbalances on collaboration in intra public sector may be explored in future works. This study was implemented in administrative justice sector dealing with complaints against mal-administration in government department where the powers are confined to Ombudsman. This framework may also be implemented in other judicial institutions where the power lies with judges.

7. Limitation

The collaboration framework was implemented where the infrastructure was already available, if we implement in those sectors where the infrastructure does not exist, the cost may be extra. The human efforts and capital is little considered which may affect the performance of the respective sector.

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Sohail Ahmad Phatak

Sohail Ahmad Phatak is an IT Professional with sixteen years of experience and a Ph. D. scholar. He did his BCS in 2002, Master in Computer Sciences (MCS) from University of Arid Agriculture Rawalpindi (UAAR), Pakistan in 2005 and MS in Engineering Management from UET Texila, Pakistan in 2009. He started his career as Software Engineer and then excels in software project management. During his professional career he has worked on different technologies in different organizations. He has worked on many national, and international IT projects. He is also Microsoft Business Solution Certified (MBSC). He has been involved in number of Public Sector's Projects in different public organization. He has been involved in developing Examination system for GHQ Rawalpindi and Microsoft Dynamics CRM development and implementations for multinational companies. He is currently working as MIS Expert in Federal Ombudsman's Secretariat, Pakistan since 2008. The submitted paper is the extract of the work done in last 9 years in Public Grievance Redressal Sector by Mr. Sohail Ahmad Phatak. He has also been involved in publishing different research papers and attended various national conferences.

Dr Asim Nisar

Dr Asim Nisar did his Bachelors in Mechanical Engineering from University of Engineering and Technology, Lahore in 1993. In 2002, he completed his MS in Advanced Manufacturing Technology and Systems Management from University of Manchester, U.K. In 2008, he completed his PhD in Design and Manufacturing Engineering from Asian Institute of Technology (AIT), Thailand. He has published 21 Journal papers in HEC recognized Journals and 23 conference papers. He is working as Associate Professor in Department of Engineering Management at Centre for Advanced Studies in Engineering (CASE), Islamabad, Pakistan.