

Impact of Collaboration and Coordination among E-Government: A Case Study of Jordan

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Abstract

Electronic government (E-Government) is massive project uses the information and communication technologies (ICTs) to become more efficient and effective of government, facilitate more accessible government services, and make government more accountable to citizens.

There are a range of challenges, difficulties, and problems facing the implementation of E-Government project, and to be optimistic, there is a range of opportunities that can be invested and built upon. One of the major challenges facing the implementation of e-government is the issue of collaboration and coordination between the state organizations themselves.

This paper aims to highlighting the level of collaboration and coordination between the various government agencies specific in development of computerized systems, in other word, we try to answer the following question; does collaboration between public sector organizations exist?

Jordan E-Government our case study, we will discuss in detail the impact of collaboration and coordination between Information Technology Departments/Directorate (ITD) among government sector.

Keywords: *collaboration, coordination, Information and Communication Technology (ICT), Information Technology Departments (ITD), computerized.*

1. Introduction

E-Government can be defined as the ability of different sectors of government to provide government information and services to citizens by electronic means quickly and accurately, with minimum costs and less effort at any time and through a single site on the Internet. E-Government as a massive project seeks to achieve greater efficiency and effectiveness in government performance, through raising the performance of services for beneficiaries [1] and citizens.

Based on this definition, the government seeks, through the application of the concept of electronic government is to re-invent itself in the performance of its functions effectively to its citizens through simplification of procedures and presented in a clear and transparent through

the internet technology. Therefore the concept of E-Government is a radical shift from traditional methods that used before, which the main results is to review of all procedures in accordance with the application of the concept of E-Government.

The application of E-Government is not paved with roses, there are a set of weaknesses represented by challenges, difficulties, and obstacles, which must be overcome. At the same time, there is a set of strengths represented by opportunities and other positive points that must be enhanced and built upon. Collaboration and coordination in very important factor for acceleration success E-Government project, for that this paper tries to concentrate on the level of the collaboration and coordination between ITD's among government sector.

2. Scope of E-Government

Several major categories fit within this broad definition of E-Government: [2].

2.1 G2C

The G2C category includes all of the interactions between a government and its citizens that can take place electronically [3][4]. The basic idea is to enable citizens to interact with the government from their homes. G2C applications enable citizens to ask questions of government agencies and receive answers, pay taxes, receive payments and documents, and so forth. For example, citizens can renew driver's licenses, pay traffic tickets, and make appointments for vehicle emission inspections and driving tests. Governments also can disseminate information on the Web, conduct training, helps citizens find employment, and more [2].

2.2 G2B

Governments seek to automate their interactions with businesses, we call this

category G2B, and the relationship works two ways: government-to-business and business-to-government [2]. G2B refers to e-commerce in which government sells products to businesses or provides them with services as well as to businesses selling products and services to government [3]. Two key G2B areas are e-procurement and the auctioning of government.

2.3 G2G

The G2G category consists of Electronic Commerce (EC) activities between units of government, including those within one governmental body [2]. Many of these are aimed at improving the effectiveness or the efficiency of the government.

2.4 G2E and IEE

G2E is an E-Government category that includes activities and services between government units and their employees [2]. Governments employ large numbers of people. Therefore, governments are just as interested as private-sector organizations are in electronically providing services and information to their employees. Because employees of state governments often work in a variety of geographic locations, G2E applications may be especially useful in enabling efficient communication. While the internal initiatives provide tools for improving the effectiveness and efficiency of government Operations like E-payroll, E-records management, E-training, Enterprise case management, integrated acquisition, integrated human resources, One-stop recruitment.

3. The benefits of E-Government

State and Government seeking through the concept of E-Government to achieve a set of goals and objectives that will benefit for all individuals, institutions and societies, the following highlight some of these objectives [2]:

1- Raise the level of IEE for processes and procedures within the government sector, through:

- Improve the level of efficiency in the use and employment of information technology.
- Construction the government agencies, internally and externally of the electronic transformation.
- Reduce the time spent in the performance of procedures within each department.

- Take advantage of the best experiences (Best Practices) in the performance of the business.
 - Accuracy in the completion of various functions.
 - Facilitate the electronic payment system.
- 2- Reduce the costs of category G2G, through:
- Improvement and development and engineering of business processes.
 - Construction the government agencies, internally and externally of the electronic transformations.
 - Facilitate the flow of business and entry into high transparency and easy.
 - Reduce the procedures and avoid duplicate information within the chain business seminars.
 - Promote coordination and cooperation between state institutions and establish the concept of integration.
 - Encourage the exchange of automated data.
- 3- Raise the level of satisfaction of the beneficiary for services provided to them G2C, through:
- Facilitate the use of government services.
 - Reduce the time it takes to get the beneficiary on the service they need.
 - Provide accurate data in a timely manner as needed.
 - Strengthen the confidence of citizens in dealing with E-Government through the assured him in privacy, confidentiality, security, and e-payment issues.
- 4- Support economic development programs G2B, through:
- Facilitate transactions between sectors of government and business sectors.
 - Reduce the costs of coordination and continuous monitoring.
 - Increase career opportunities.
 - Increase the profitability of the revenue transactions with government business sectors.
 - Encourage the building of infrastructures and the dissemination of technical information for high efficiency.
 - Open new opportunities for private sector investment information.
 - Achieve a high degree of integration between government and private sectors to serve the national economy.
 - Provide some services of interest to a large segment of the public and

investors on the Internet or on the phone line or mobile phone.

- Provide accurate and updated information to decision makers and investors.

4. Overview of Jordan E-Government

E-Government in Jordan is a National Program initiated by His Majesty King Abdullah II. The purpose of this program is to enhance the performance of the traditional government in terms of services provision, efficiency, accuracy, time and cost effectiveness, transparency, high level of customer satisfaction, cross-Governmental integration, and much more of others to the Government [4]. E-Government will drive the Government transformation and will use communications and Information Technology to achieve the ultimate goals. The Ministry of Information and Communications Technology (MoICT) was assigned to take the lead in coordinating efforts of implementing the E-Government Program, facilitating and providing support whenever needed to Government entities participating in the E-Government program implementation. MoICT has established a Program Management Office (PMO) and staffed it with subject matter experts in the important areas, to enable MoICT achieve the required success in its mission while implementing the E-Government Program.

The state apparatus is the largest and most complex systems in which to organize and manages the affairs of citizens. The organizational structure in Jordan government [5] consists of more than 25 ministries and more than 180 Department / Institute / body / authority / Foundation / Fund / Bank / Office / security / Destinations military / and others. Taking into account that most of the ministries follow a group of independent departments, these departments may be administratively and financially independent, e.g. the Department of Lands and Survey (DLS), the General Customs Department, General Supplies Department, Department of General Budget, Income Tax Department and Sales, and Free Zones Corporation, all these departments under the Ministry of Finance, more than 36 directorates for DLS, 190 municipalities, 15 government hospitals, 75 directorates of civil status department, and etc.

In total there are approximately more than 500 ministry, government department, and government organization. This is normal situation, because all governments in the world

have the same structure and plus/minus the same number.

5. MIS Types

An information system (IS) can be any organized combination of people, hardware, software, communications networks, data resources, and policies and procedures that stores, retrieves, transforms, and disseminates information in an organization. Information systems have always been needed to process data generated by, and used in, business operations [6]. The following are the types of MIS:

1. Operations Support Systems: produce a variety of information products for internal and external use, there types are:
 - Transaction Processing Systems: Process data resulting from business transactions, update operational databases, and produce business documents. Examples: sales and inventory processing and accounting systems.
 - Process Control Systems: Monitor and control industrial processes. Examples: petroleum refining, power generation, and steel production systems.
 - Enterprise Collaboration Systems: Support team, workgroup, and enterprise communications and collaboration. Examples: e-mail, chat, and videoconferencing groupware systems.
2. Management Support Systems: Providing information and support for decision making by all types of managers and business professionals is a complex task. There types are:
 - Management Information Systems: Provide information in the form of pre specified reports and displays to support business decision making. Examples: sales analysis, production performance, and cost trend reporting systems.
 - Decision Support Systems: Provide interactive ad hoc support for the decision-making processes of managers and other business professionals. Examples: product pricing, profitability forecasting, and risk analysis systems.
 - Executive Information Systems. Provide critical information from MIS, DSS, and other sources tailored to the information needs of executives. Examples: systems for

- easy access to analyses of business performance, actions of competitors, and economic developments to support strategic planning.
3. Several other categories of information systems can support either operations or management applications. There types are:
 - Expert Systems. Knowledge-based systems that provide expert advice and act as expert consultants to users. Examples: credit application advisor, process monitor, and diagnostic maintenance systems.
 - Knowledge Management Systems. Knowledge-based systems that support the creation, organization, and dissemination of business knowledge within the enterprise. Examples: intranet access to best business practices, sales proposal strategies, and customer problem resolution systems.
 - Strategic Information Systems. Support operations or management processes that provide a firm with strategic products, services, and capabilities for competitive advantage. Examples: online stock trading, shipment tracking, and e-commerce Web systems.
 - Functional Business Systems. Support a variety of operational and managerial applications of the basic business functions of a company. Examples: information systems that support applications in Accounting, Finance, Marketing, Operations Management, and Human Resource management which include Payroll and Personnel systems.

Functional Business System is our target in this study. These computerized systems are very important and must be available and provided in all sectors. All ministries, government departments, institutions and companies greatly needed this type of software for development, modernization, and to help decision makers.

6. The Statement Problem

One of the major categories of E-Government is Government-to- Government. The G2G category includes all of the interactions between a government and itself that can take place electronically [7] [8].

We believe that the application of E-Government will grow and prosper if it has achieved the requirements of users, also, the services are provided through E-Government

must be consistent with the needs of employees. If the employees achieve their needs, the level of satisfaction for E-Government will increase. ITD is an important part of the organizational structure in each ministry, government department, and any organization. One of the most significant tasks of ITD is to computerize necessary systems like Accounting, Finance, Marketing, Operations Management, and Human Resource Management which include Payroll and Personnel systems. This packaging of systems called Functional Business System. Because of absence of collaboration and coordination between the state institutions, it is repeating the same Functional Business System in all ministries and government departments. In other words, the government will repeat computerize the same systems many times, in the sense that the number of times of computerizes the same systems equal to the number of government agencies. Considering that the government is one device Institutionally managed, this redundancy work in this way will cause in a waste of the state budget and misuse of sources. This kind of problem appears when there is no collaboration and coordination between governments itself. The aim of this paper is find solutions to overcome this problem.

7. Literature Review

E-Government is concerned with not only providing public services but also value added information to the citizens. It also enables government organizations to work together efficiently and effectively.

E-Government means the services available to the citizens/employees electronically. It may provide opportunity to citizen to interact with the government for the services that they required from government. ICT plays an important role to providing the easy services by the government to government. Government should be provided collaboration and coordination among ITD's to reduce effort, money, and time as can as possible. It does also help the government for sharing knowledge, resources, and infrastructure.

In Pakistan [9] collaboration is necessary in E-Government project. We need information from different departments. We are efficient on our side, we are lacking cooperation. The Pakistanis discussed the matter with other organizations but they are not taking interest. Collaboration in Pakistan is possible if government took initiative to establish collaborating governing body.

The initiative of the State of Andhra Pradesh in India [10] to computerize the 1,124 administrative units, called mandals, in order to realize online delivery of services, required strong coordination and collaboration between various departments. Different databases were handled and managed by different departments, one from the revenue department, one from the national informatics department, another from the social welfare department. These departments were geographically spread over an area of 275,000 sq. kms., but the timeless delivery of services required the instant collaboration, communication and interaction between them.

A 'new' development model [11] is merging that focuses on partnership among stakeholders in the knowledge-based development program. The new E-Government paradigm [12], which emphasizes coordinated network building, external collaboration, and one-stop customer services, contradicts the traditional bureaucratic paradigm, which emphasizes standardization, departmentalization, and division of labor.

8. The Reality of Computing in Jordan E-Government

Jordan has more than 500 organizations (ministry, government department), all these organizations share with the existence of ITD on their organizational structure, and this means that the number of IT departments is equal to number of the organizations, this mean again that we have more than 500 ITD's in Jordan government.

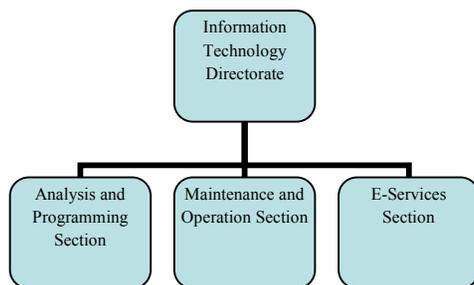


Fig. 1 Organizational structure of ITD

The organizational structure of ITD's mainly consists of three sections, as shown in fig. 1:

- Analysis and Programming Section: this section responsible for System Development Life Cycle (SDLC), which contains analysis, design, implementation, and maintenance. Supervise the preparation and development of the information collection forms and writing

programs to retrieve and provide stakeholders with the necessary data and information continuously. And database consolidation.

- Maintenance and Operation Section: this section responsible for supervise the operation hardware and operating systems assistance and follow-up performance, modified and updated to ensure the achievement of the required efficiency. Ensure the availability of safety requirements and information security devices continuously. Develop programs daily and periodic maintenance and preventive services and overseeing its implementation. Overseeing the development of regulations and programs adopted to meet the requirements of copy operations support on a regular basis.
- E-Services Section: this section is responsible for designing web sites, updated, and all related topics. Besides launching and follow up the services that are available on the site.

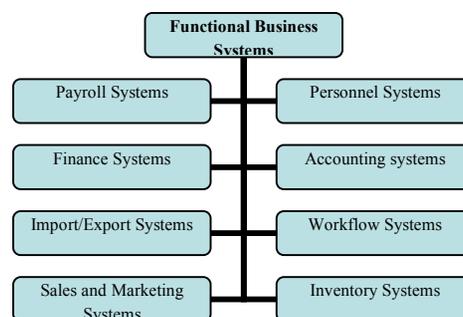


Fig. 2 Functional Business Systems

Fig. 2 has shown the functional business systems. These kinds of systems are necessary and very important for each organization. This type of systems as lifeblood for organizations, because it plays an important role in the development and modernization, moreover, these systems help all levels of management in their works achievement. It helps decision makers to take their right decisions in appropriate time. Functional business systems can be classified as following:

- Human Resources (payroll, and personnel) information systems: systems that maintain employee records, track employee skills, job performance, and training; and support planning for employee compensation and career development.

- Finance and accounting information systems: systems used to keep track of the firm's financial assets and fund flows.
- A workflow and import/export management system has a number of functions that can be used to define and track workflow processes, making both the progress of a case through a workflow and the structure of the flow itself easier to revise. It therefore is clear that workflow management systems have become the ideal tool for achieving business processes reengineering.
- Sales and marketing information systems: systems that help the firm identify customers for the firm's products or services develop products and services to meet their needs, promote these products and services, sell the products and services, and provide ongoing customer support.
- An inventory control system: is a process for managing and locating objects or materials. Inventory control system is a systematic way of handling the flow of material which will be beneficial for industries and help.

The dangers point, every ITD in each organization individually started developing these systems from scratch; its dangers also because it entails at this point other consequences, e.g. misuse of money, time, and effort.

The requirements (without detailing) for developing these systems:

- Software: includes databases and their licenses, the necessary programming languages, and operating systems.
- Hardware: includes the necessary number of computers, computers specification as client or server.
- Developers: includes analysts, designers, database administrators, and programmers.
- Maintenance: includes all forms of software and hardware maintenance.

Until provide these requirements, they must walk in the formal procedures, and addressing the official authorities to achieve these requirements, and the important thing, the cost of these requirements is a significant part of the organization's budget. Speaking of budget, Jordan, as a developing country suffering from a lack of financial resources, and we will see later in this paper how is waste of public money, because of the absence of all forms of collaboration and coordination.

9. The Impact of Absences of Collaboration and Coordination

Online communication and collaboration and coordination allows government agencies and departments to share databases, resources, pool skills and capabilities, enhancing the efficiency and effectively of processes. Collaboration and coordination means sharing knowledge, resources, and IT infrastructure, this means also saving money, time, and efforts.

Based on what was presented in the previous section, we will look at this section to the extent of the impact of the lack/absences of collaboration and coordination between state agencies. This issue will be addressed from three phases:

1. Money phase: In this paragraph we will assume some figures which are very close to the real figures, and these figures are coming from our experience work in public sector more than 11 years. Assume that the cost of the requirements of developing the functional business systems ranges between \$ 150,000 (minimum cost) to \$ 250,000 (maximum cost) per site. According to that, table 1 has shown the detailed figures about the cost of the requirements systems.

No. of Sites	Minimum \$ Cost	Maximum \$ Cost
1	150,000	250,000
300	45,000,000	75,000,000
500	75,000,000	125,000,000
700	105,000,000	175,000,000

Table 1 The Cost of Requirements

As table 1 shown, 500 government sites will cost the Jordan budget amount between \$75,000,000-\$125,000,000. This is large amount, the state shall provide for a fraction of the computing. New technology through E-Government must help the government to save their resources as can as possible, especially the public money. So, you can find solutions perform the same purpose at a lower cost, and this is what would be provided by this paper.

2. Time phase: Assume that the time for developing the functional business systems ranges between 360 working day (minimum time) to 540 working days (maximum time) per site. According to that, table 2 has shown the detailed figures about the time of developing systems serially.

No. of Sites	Minimum Work day	Maximum Work day
1	360	540
300	108000	162000
500	180000	270000
700	252000	378000

Table 2 Time needed for developing systems serially

As they say, time is money. Table 2 has shown the time for developing 500 government sites, it will take from 180,000 to 270,000 day. It will take from 493 to 740 year if the work done serially, which is incredible, to solve this problem of time, every organization parallel doing their works. Time taken to computerize these systems is a tremendous time, while we can use the time in efficient and effective manner; so that they can accomplish the same work in less time and with higher efficiency. Finally, every organization is doing its job individually to save time at the expense of money. This is what this paper will describe.

3. Effort phase: there are 500 teams of IT staff working individually, they are working the same job for same government. There are duplicate their working, they are duplicate their efforts. Waste of effort and drain energies in a bad way, while this can be directed manpower in a positive direction.

Obviously there is a real problem in the procedures for computing systems in Jordan. It is also obvious, the absence of collaboration and coordination between government agencies. So, the natural result of this problem is wasting money, times, and efforts. As a result of the current situation, and from technical point of view, the developing systems suffer from poor of interoperability, integration, and standards.

10. Collaboration Model

Collaboration and coordination between the devices of the State classified as a managerial issue, and by default its effect directly on the technical aspects. To solve this problem, we suggest the collaborations model, as shown on figure 3. Collaborations model consists of three parts; managerial, information technology, and employee's part.



Fig. 3 Collaboration Model

1. **Managerial Collaboration Part:** in this part it's necessary to formation high managerial body with broad powers, responsible for developing the necessary plans and programs, supervising the progress of an E-Government program, facilitate procedures, overcome obstacles and solve problems. The managerial collaboration part can be part of MoICT, there experts in the areas of project management, change management, technical management and support services, risk management, quality management and other competencies.
2. **Information Technology Part:** This part includes experts from all disciplines, project leaders, IT managers, analysts, designers, databases administrators, IT developers and others. This part responsible to development the necessary specifications for developing systems, in terms of software, databases, hardware, and any other equipment. Identify policy development to develop systems to ensure interoperability, integration, shareable, and standards.
3. **Employees Collaboration Parts:** Employees are the most important category, because they are best placed to translate the aspirations of E-Government into reality. Must promote a culture of collaboration between state employees, regardless of their organizations, spreading the spirit of belonging to the organization and a government together, develop programs to encourage employees to work as one team, develop programs to motivate employees to work collectively with their peers from other organizations. At the end, if we have well-trained-educated-awarded-collaborated employees we guarantee successful E-Government.

Let's now measuring the effectiveness of collaboration model through applied to the case mentioned earlier in this paper.

Before that, it is worth mentioning here, that the government devices managed by same governmental environment in terms of laws, regulations, procedures, polices, and funds that applied equality to all organizations and individuals.

For example, all civil servant in different organizations, works under the same functional scale in terms of degree and salary, the same thing done also for financing, accounting, inventory, workflow, and marketing.

10.1 The Solution based on Collaboration Model

Three steps within the model of collaboration can resolve all kinds of computing, and this is what we will see for solving the above-mentioned problem.

1. Managerial Collaboration Part: the tasks of this part is to formulation the policies and preparing the necessary national programs, while the main tasks also is to identify the needs systems for government organizations. The functional businesses systems are very important for all government organizations, these systems determined in this part and included on the Commission's agenda. Take into account when developing the systems, integrative and comprehensive among all state agencies. Considering that the place of applicable these systems is state organizations. So we're talking at this stage for the highest levels of collaboration between different state organizations. This stage institutionalizations the collaboration, among state agencies. Full collaboration system associated with this stage, if this stage administration successfully, the rest of the parts will be successful. In this stage we will identified who would be responsible for systems later, in terms of management, maintenance and follow-up. For example, the responsible of financial systems is Ministry of Finance, while HR systems are the responsibility of the Civil Service Bureau, and so on.

2. Information Technology Collaboration Part: in this part, establishment of technical collaboration between governments agencies will be done, determine the number of institutions that benefit from the applicable of the systems. After classification the systems, it must determined the technical teams, software, hardware, databases, architecture, and ant thing will help. One advantage of a technical cooperation at this stage enhanced interoperability, integration, and shareable, while in other side this stage will saving money, time, and effort. For example, and based on the

nature of the works of systems, the systems are divided into four sections. Four specialized technical teams formed, varying numbers difference depending on the size of systems, included all professional disciplines needed by each team. These teams studying systems using methodology study. Taking into account the granting, security, safety, confidentiality, and integrity

3. Employees Collaboration Part: Staff must feel the new spirit of collaboration, during the course of the development of the systems must establish a culture of collaboration, and that the focus is on employee motivation to work in the spirit of participatory instead of the isolation and individual work. Formulate new programs that contribute to the new approach, which aims to successful e-government with benefit to all.

After the completion of the process of computing, installation, testing, and operation, any employee if he authorized, from any ministry or organization can be access to the data, within client-server architecture.

In this paragraph I will discuss the results for collaboration model based on three factors money, time, and effort.

1. Money phase: table 3 shown the four categories systems, finance includes finance and accounting, HR includes payroll and personnel, marketing includes sales and marketing, and workflow includes import/export and workflow. For each systems types there is a team leader, this team leader responsible for developing, programming, installation, testing, training, maintaining, and documentation. The minimum cost of the requirements for all four types is 600,000\$, while the maximum cost is 1,000,000\$.

No. of Teams	System Types	Min. Cost \$	Max. Cost \$
1	Finance	150,000	250,000
1	HR	150,000	250,000
1	Marketing	150,000	250,000
1	Workflow	150,000	250,000
	Total	600,000	1,000,000

Table 3 The Cost of Requirements

2. Time phase: four teams will start working at the same time; one year is enough to finish working all types of systems, four teams works parallel, which is correct way, as column 3 in table 4 shown, while the four types of systems will take 540 day to finish as column 4 shown in table 4.

No. of Teams	System Types	Minimum Work day	Maximum Work day
1	Finance	360	540
1	HR	360	540
1	Marketing	360	540
1	Workflow	360	540
	Total	1440	2160

Table 4 Time needed for developing systems serially

- Effort phase: it's obvious that if we applied the collaboration model then we will obtain very good results. No duplicate for effort as table 4 shown, we need just one professional team for each type of systems to finish the works. No need to duplicate the same works, the saving of efforts can be using in other works.

10.2 Comparison Study Between Current Situation (Old Model) and Collaboration Model

Effortlessly, that the results we have obtained from collaboration model is much better than those results we have obtained from the model currently used (old model), based on money, time, and effort, the following paragraph describe that.

The cost of requirements of these kinds of systems is 1,000,000\$ in collaboration model, while in the old model, the cost is 75,000,000\$. If the works done serially, the time needed for developing these systems will take four years in collaboration model, while it take 493 year in the old model. Finally, no duplication of efforts in collaboration model, while the same work will be repeated 500 times in the old model.

Collaboration model solving very critical point related with technical issues, this model will overcome the following:

- Integration Systems: E-Government planners should develop their systems and applications that work together and across departments, the systems should be strongly related, opened, and interact with each others.
- Interoperability: systems in government departments should be homogenous, taking into account the interoperability between old and new systems, because systems working together. As a result and through using common standards throughout the government to shorten development time and ensure compatibility.

- Record Mobility, e.g., citizen record SNN (Secure National Number), land record, car record, patient record, and etc. Sharing data between government department is very useful because it saving money, time, and efforts. To achieve these goals, designer must simplify the processes of manual record to make the transformation for mobility record easier.

From these results, we encourage the government to go forward applied the collaboration model to achieve greatest results.

11. Conclusions

To achieve successful implementation of E-Government in Jordan it should be taken into account the collaboration and coordination between the government organizations. If we have a good level of collaboration and coordination, it's easy to obtain saving of our resources like money, time, and effort.

The current situation in the level of collaboration does not promises well, the level of collaboration between state agencies is missing, does not exist, lack, and very poor.

We hope after identifying and addressing this problem to help decision-makers to work to overcome and to resolve it.

12. Future Works

In order to achieve complete and success e-Government, the government must solve all problems, particularly collaboration and coordination between government agencies, this issue still need hardworking from researcher to convince the government to deal with this issue seriously, through the benefits derived from collaboration and coordination between state agencies.

There are real problems in collaboration and coordination at the top management level. What we needed is action and real procedures that towards the adoption of the principle of collaboration.

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