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Government ICT Project Failure Factors: Project Stakeholders' Views

Haslinda Sutan Ahmad Nawi[1]
e-mail: haslindasan@unisel.edu.my

Azizah Abd. Rahman[2]
e-mail: azizahar@utm.my

Othman Ibrahim[3]
e-mail: othmanibrahim@utm.my

Author(s) Contact Details:
[1] *Universiti Selangor, Bestari Jaya, Selangor, Malaysia*
[2, 3] *Faculty of Computer Science and Information Systems, Universiti Teknologi Malaysia, 81310, Skudai, Johor, Malaysia*

***Abstract* —** Information and communication technology (ICT) offers major transformational opportunities by contributing to the improvement of productivity, competitiveness, growth, wealth creation, poverty reduction and spur of knowledge-based economy. It should be a transformational force, a tool to enable government not only to improve public services but to also dramatically improve the relationship between citizen and state. In Malaysia, ICT was listed as the catalyst of economy growth under the Economic Transformation Programme (ETP). ETP is a focused, inclusive and sustainable initiative that will transform Malaysia into a high-income nation by the year 2020. However, there exist particular challenges for the success and sustainable ICT projects provision in such contexts that lead to low success rates. The purpose of this study is to identify and understand the failure factors and their symptoms of government's ICT projects implemented in Malaysia through the eyes of its stakeholders. This study uses interview as a strategy to collect qualitative data of 7 stakeholders in ICT project implementation. 28 failure symptoms were discovered and mapped within 6 failure root causes and later classified according to 3 project failure types. We conclude that if weaknesses in project management are addressed, most of the symptoms identified in this study could be successfully overcome.

Keywords – government's ICT project; ICT project failure factors; ICT project failure root causes

1. INTRODUCTION

Government's Information and Communication Technology (ICT) projects have become notorious for running far behind schedule and failing to deliver the expected benefits. A survey in 2005 discovered that 31% of Information Systems (IS) projects failed to deliver on time and another 31%, within budget [1]. Furthermore, a study by Ernst & Young in the Czech Republic in 2009 revealed that more than 50% of IS projects were not completed on time or on budget. 5% of the projects were stopped before they were even completed. According to [2], most large IS projects will exceed their original budgets and timelines by more than 50% and this occurs much more often in the government than in the private industry. In addition to that, there are evidence that "runaway" projects occur frequently, and new empirical evidence that they occur more often in government organizations [2, 3]. However, in the past two decades, many governments around the world have become aware of the potential of ICT in enhancing their service and increasing their efficiency. Reference [4] supports the idea of ICTs having the potential to transform government structures and to improve the quality of government programs and services. Prior studies as in [5] mentioned many national, state, and local governments are struggling to make better decisions about ICT investments as part of their transformation agendas.

Recently, the current Prime Minister of Malaysia launched the Economic Transformation Program (ETP) to propel Malaysia's economy into a high income economy. In addition to that, the 10th Malaysia Plan (10MP), clearly articulated the central role of ICT as a foundation for the nation to vault forward towards a high-value economy. In line with that, Malaysia's government had listed ICT as its 12 National Key Economic Areas (NKEAs) in the new economic model (NEM) that intends to build the foundation for 10MP. The NKEAs are at the core of the ETP and is defined as a driver of economic activity that has the potential to directly and materially contribute a quantifiable amount of economic growth to the Malaysian economy. This translates to ICT playing a key strategic role as an enabler of national infrastructure, education and human capital development for the NEM. While such development can be further accelerated through ICT, pressure is increasing to address the causes of failure in ICT projects.

This research considers views of project stakeholders who manage and monitor ICT projects in government agencies. The study identifies and analyzes the failure symptoms of government's ICT projects in the Malaysian context as a lesson learned in order for them to be the catalyst of economy growth under the Economic Transformation Programme.

2. LITERATURE REVIEW

A. Government's ICT Project

As e-government projects are renowned for their high failure rate, the government has recognized the problems related to the successful development of those projects. In the Malaysian public sector, the implementation strategy of the ICT projects handled are: in-sourcing (internal personnel and expert); outsourcing (external services); and co-sourcing (external services with internal expert). Subsequently, the types of project are; ICT research; ICT strategic plan; application system development; hardware and software procurement; ICT system enhancement; expansion of ICT system; and ICT compliance and fortification.

According to the Attorney's report in 2006, customs spent RM 290 million for underutilized systems and as a solution, the Deloitte Consulting firm was appointed to prepare a plan worth RM 451 million to overcome this problem [6]. The Ministry of Health has also invested in ICT for the MyHealth project but this investment resulted in the project being extended from 2007 to 2012 [6]. However, it is clear that the implementation of electronic services brings benefits to the public, businesses and the government itself. As for the public, saving time and money are the primary reasons to use electronic service facilities for interaction with the government agencies. Malaysian public sector should pay attention in increasing the success rate of the ICT project that meets specific government strategic objectives towards effective service delivery to its citizens.

B. Project Failure Classification

A number of studies have dealt with the concept of success/failure factors in ICT projects, and some different types of models have been established. The ITPOSMO factor model proposed by Heeks in 1999, consists of seven key dimensions [7]. Each of these dimensions has, in turn, a set of Critical Success/Failure Factors that were drawn for analyzing e-government projects in different countries. These dimensions are:

- Information (factors related to quality and prerequisites of system inputs and outputs);
- Technology (factors such as the availability and compatibility of hardware and software);
- Processes (alignment and integration between the system and existing/new processes to achieve stated objectives);
- Objectives, Values, and Motivation (e.g. organization culture, guiding values);
- Staffing and Skills (factors such as the availability of skilled personnel and adequacy of training provided for using the system);
- Management Systems and Structures (factors such as managerial practice and flexibility of organizational structures); and
- Other Resources (money and time required).

Yeo's [8] survey, conducted in 2000, of close to 100 respondents associated with a major project failure in Singapore, grouped failure factors into three organizational categories as below;

- Context-driven: factors dealing with culture, leadership, and organizational issues.
- Content-driven: factors related to technology and business process, the ―what and the ―how.
- Process driven: factors related to strategic formulation and change management or under the influence of the project manager.

A different approach has been used as in [9]. The authors categorized the framework as consisting of four quadrants: customer; scope and requirements; execution; and environment as below:

- Customer: focuses on risk factors relating to customers and users. These factors are often beyond the project manager's control.
- Scope and requirements: focuses on risk factors associated with a project manager's inability to judge a system's scope.
- Execution: focuses on such risk factors as inadequate project staffing, inappropriate development methodology, failure to define roles and responsibilities, and poor project planning and control.
- Environment: focuses on risk factors in both internal and external environments, including changes in organizational management.

[10] who studied the cause of problems with the Dutch government's ICT projects categorize factors that could affect the project in threefold;

- Political complexity

- Organizational complexity
- Technical complexity

Another study of [11] believes that any symptom of a project failure should belong to one of the 6 generic types of IT project failure root causes: project management factors; top management factors; technology factors; organizational factors; complexity/size factors; and process factors as in Figure 1.

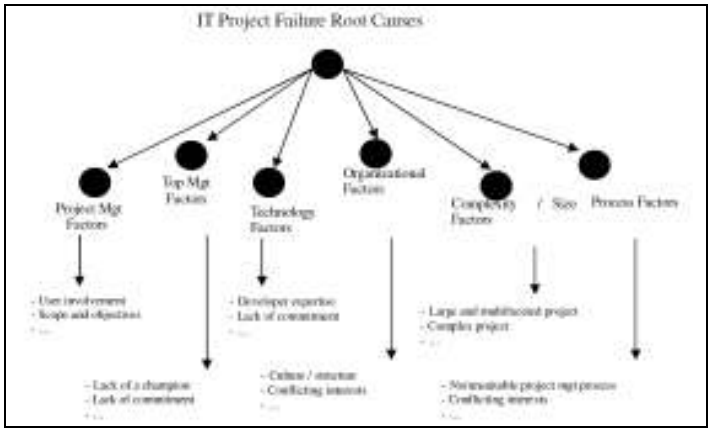

FIGURE 1: IT Project failure root causes [11]

All 5 approaches focused on the domain of IS and ICT project. Research on IS and ICT failure phenomena has been conducted in diverse perspectives. Reference [12] agreed that a fundamental reason that causes IS projects to fail is their severe complexity. Because of the complexity, projects must handle its complexity factors and also other major factors such as technological, organizational, top management and project management. In addition, [13] opined a process failure occurs when an IS cannot be developed within an allocated budget, and / or time schedule. Considering the scope of the research is on public e-services project, the study adopted the 6 generic types of IT project failure root causes proposed by [11] because it presents generic types of root causes factors and shows there are commonalities in failure factors in all domains. For that, any symptom of a project failure should belong to one of the root causes in the taxonomy.

3. METHODOLOGY

The research methodology being used in this research is qualitative method. Analysis of the factors and symptoms contributing towards the government's ICT projects failure is the subject examined in this research. Three steps were involved in this study as in Figure 2.

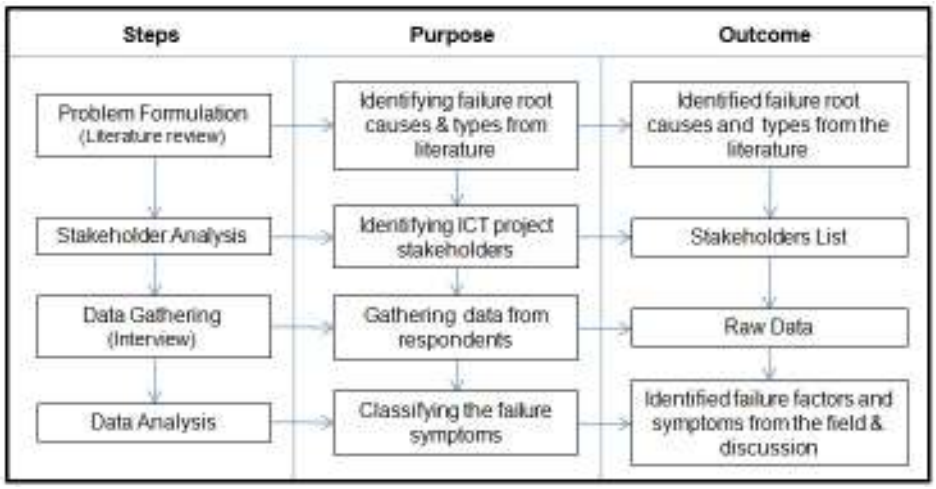

FIGURE 2: Operational framework

Problem Formulation: The researchers identify the failure factors dimensions from the literature and adopted the six generic root causes [11] that are believed to be highly suitable for the application system domain. This model has been one of the bases of several studies; e.g. A Taxonomy of an IT Project Failure: Root Causes [11], and Government's ICT Project Failure Factors: A Revisit [14].

Stakeholder Analysis: A stakeholder analysis was done to facilitate the research in identifying those who have a 'stake' or an interest in the projects. A comprehensive interview session with 4 officers in government ICT project planning and approving agency was conducted and 4 groups of ICT project's stakeholders were identified which are:

- User – citizens who use the e-service application system that directly inputs the data.
- Regulator - policy and process owner who determines institutional administrative policy and procedures.
- Implementer - agency that owns and operates the e-service application system.
- Service provider - organization that supply, install and maintain the e-service product and its documentation as soon as the contract is signed.

Data Gathering: A Purposive sampling of 7 respondents who are the ICT project stakeholders was selected. 4 of the respondents are senior officers of public sector ICT project planning and approving agency. They are experienced in managing and monitoring government's ICT projects, with work experience of approximately 10 years. Another 2 respondents are officers of public sector who have had more than 5 years of experience in monitoring ICT projects in their agencies. One respondent was from the vendor group, which had 7 years of experience in managing public e-services project. They were interviewed and data was interpreted based from the respondents' experience and examples given during the interview sessions.

There are many ways to measure success or failure, but there is no clear dividing line identifying the two. It is almost impossible to arrive to an agreement as to whether a project succeeded or failed [15]. It may be useful to view them as being subjective judgments when trying to make sense of the ambiguity of notions of success and failure [15]. Anyway, to assure consistency, the study adopted the failure definition used by [16] that categorizes projects into three resolution types which are;

- Total Failure: An ICT project which has ended up as not being implemented, or a new project that has been implemented, but eventually abandoned.
- Partial Failure: Major goals of the ICT project have not been attained or significant undesirable outcomes are experienced. A reasonably clear form of partial failure is sustainability failure where a project succeeds initially, but then fails after a year or so.
- Success: An ICT project attains its major goals and does not experience significant undesirable outcomes.

Data Analysis: From the interview, the responses gathered were mapped to the failure root causes from the literature and then classified to the identified failure types.

4. ANALYSIS RESULT AND DISCUSSION

A. Failure Root Causes

Result of the research contributes to the identification of 28 failure symptoms which influence the ICT projects of the Malaysian government. These failure symptoms were mapped into 6 dimensions of failure root causes by [11] and [14]: project management; top management; technology; organizational; complexity / size; and processes as depicted in Figure 3.

Project Management Factors: The issues of not meeting the user requirement were common issues arising in most of the projects. One of the respondents said that this is caused by the failure of the vendor in generating user involvement in the project. In some cases, different officers were assigned for the same module and this made it difficult for the vendor to get consistent cooperation.

Controlling and managing risk in ICT projects is considered to be a major contributor to project success. Not managing the project risk until it became a problem was also highlighted by the respondents as a major cause of project failure. One of the examples given is a project falling behind schedule due to the vendor's inability to deliver the product due which is then blamed on shipping problems. A better risk management, as a project and organizational capability, is critical for ICT project success in the public sector environment.

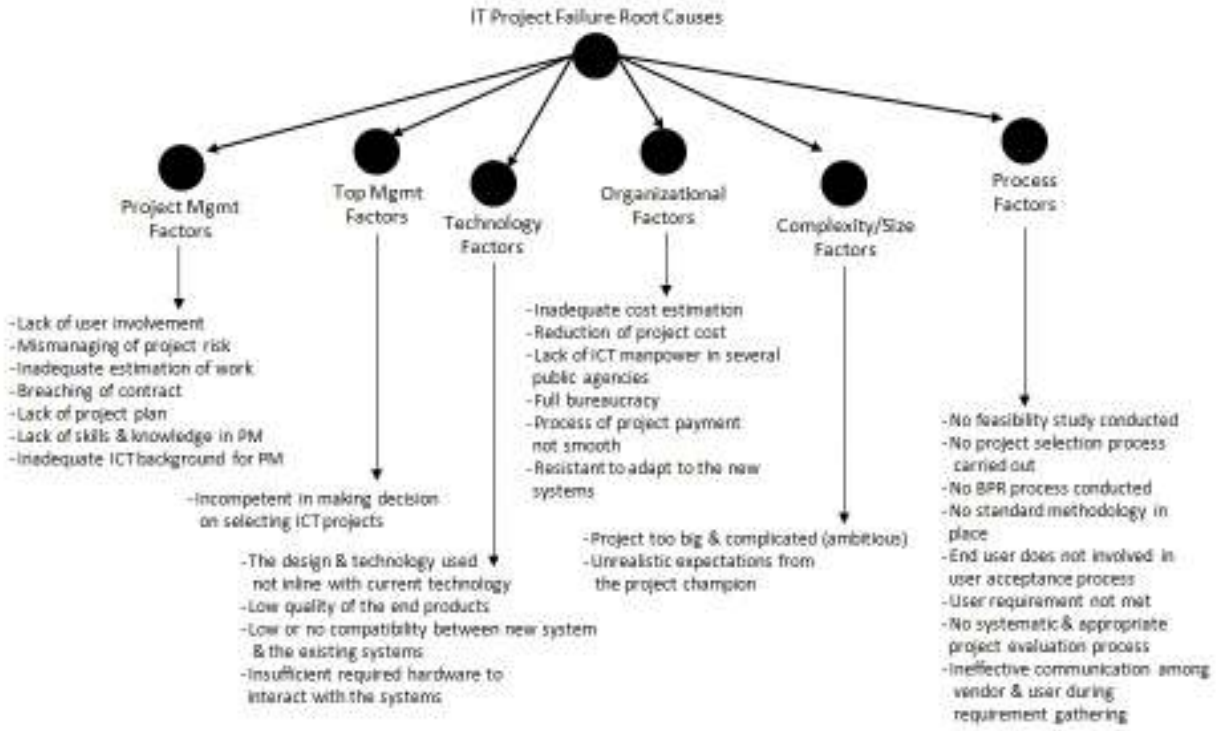

FIGURE 3: 28 failure symptoms classified into 6 dimensions of failure root causes

Other than that, underestimating the complexity of the project task and activities also leads to more resources required to resolve the resulting issues. Furthermore, inadequate project planning causes a delay in project implementation, which resulted into inappropriate systems with outdated design and obsolete technology.

Another common occurring issue is when either side fails to adhere to the contract during the project as a result of inadequate resource or contract management or change control processes. An example of this is, the vendor agreeing to take on extra work, out of scope of the original contract, without the time or resources within the contractual allocation to actually deliver. One point mentioned was "*We have 3 different approaches in implementing ICT projects: in-sourcing; outsourcing; and co-sourcing. But when we give the projects to third party - the vendor or the consultant, we must be careful with the contract to ensure they comply with the term accordingly, especially when it relates to technological changes."*

The other respondent said that *"..outcome from Audit Research by National Audit Department in 2008 was one of the major factors of ICT project failure is the weakness in project management.*.". Most of the Project Managers had no project management skills and sometimes, no appropriate ICT background. Sometimes, not only the project manager but the entire team has weaknesses in managing ICT projects. Some project managers still fail to make good project managers despite having IT backgrounds. All respondents agree that a Project Manager must have project management skills and good characteristics (have the ability to organize, could communicate and deal with people, and could create and maintain good relationships). In addition to this, another common scenario is the failure to involve the right people for the project because of 'office politics' during the project implementation. An example of this is favoritism, where the selected person is the favorite person of the person in charge of the department.

Top Management Factors: From the interviews, 100% respondents agreed that it is vital for senior management to be supportive to a project and to provide the necessary resources to carry it out. However, inappropriate ICT knowledge, lack of familiarity, and background among the top management who were selected and decided on the project with the target technologies will cause inaccurate decision and eventually contribute to the project's failure.

Technology Factors: According to the respondents, there are cases where the developers fail to align the system design and technology used with the current technology, which resulted into inappropriate systems with old design and obsolete technology. This always occurred with the overextended schedule project. Apart from that, low quality of the end product is also mentioned during the interview. This relates to the technological factors and the fact that the person

responsible and accountable not possessing appropriate ICT background. Another complicating technological factor is that ICT systems often have to be connected to other systems already in operation. Compatibility between ICT systems – already a major issue within a single agency – becomes especially challenging where a number of agencies are involved. A statement from one respondent - *"As government agency manager, I find that ICT application is very helpful. The transformation of government service electronically is valuable and constructive. The government has a large and complex IT estate and the majority of it works efficiently and effectively for me so far. However, we are always looking for ways to improve and I look forward to working with the right vendor in the future to ensure the quality in term of interoperability and compatibility."* – This statement confirms that, the selection of vendor that could deliver good products in term of interoperability and compatibility is another factor that is important in ensuring the projects' success.

Organizational Factors: Among the respondents comments were – *"..we spend money each year on ICT application development, statistically, 16% of projects will be cancelled before they ever get completed., 53% of projects will cost twice as of their original estimates, overall, the success rate is less than 31%...Why did the project fail? It could be various factors but I'm sure one of them was they did not plan or estimate the cost correctly.."*. There are cases where the average cost of a project has been reduced by the government due to the economy downturn scenario. In other cases, there are agencies or the project champions which did not accurately complete the project cost estimation which resulted in budget overruns.

Complexity / Size Factors: Size and complexity of the projects also cause delay and frequent budget overruns. The number of agencies involved is too high and it becomes complicated because their business processes are related and require exchange of information. Central steering of the project is difficult or sometimes even impossible in these cases. An opinion from one respondent that has 7 years experience as a vendor / consultant - "*from my personal view, probably 70% of IT project failure is due to politics.. adding so much cost and complexity that the project exceeds the cost or benefits..*".

Process Factors: Project was given without any prior feasibility study, due to no project selection process. The respondent comments – *"a strategic approach to project selection yields better results for organizations by minimizing the failure risks and maximizing the potential of project success.."*. In addition to that, two respondents said the selection of the project is not based on government strategic plan such as the NKRA, NKEA and etc. They also mentioned that in most cases for project selection, there is an absence of an appropriate ICT project evaluation process on the part of the government. The respondents also highlighted that one of the causes of project failure is that no business process reengineering (BPR) takes place before the project starts although the project is big and complex. Other than that, there is no standard methodology used during the project execution. The projects always depend on the vendor's methods of project management and execution. As a result, monitoring of the projects become difficult. In terms of getting user involvement in the project, in most cases, the vendor or developer team failed to obtain full user involvement especially during the user acceptance test. As a result, users do not use the system after it is implemented. This happens due to the systems not meeting their requirements and work process. In addition to that point, the users complain that the vendor failed to meet their expectations.

B. Classified Failure Factors

The 28 symptoms that were mapped in Figure 3 were then classified according to 3 project failure types: project failure; systems failure; and user failure as depicted in Table 1. It shows that 53% of the symptoms were classified under project failure types while another 36% classified under systems failure and only 11% of the symptoms were classified under user failure. These failure types summarized by [17] and [18] were:

- Project failure: the project does not meet the specification agreed upon, including the functional requirements, budget, or completion deadline;
- System failure: the system does not work properly, including expected performance, not being used in the way intended, or used as intended but does not deliver the expected benefits, or
- User failure: the system is not used in the face of user resistance because of such things as recalcitrance, lack of training and ability of staff, and the complexity of the new system.

TABLE 1: Classified Failure Factors

Failure Factors Dimensions		Classified Symptoms from the Field into Failure Types			
			Project Failure	Systems Failure	User Failure
1	Project Management Factors	1	Lack of user involvement.		
		2	Mismanaging of project risk.		
		3	Inadequate estimation of work.		
		4	Breaching of contract.		
		5	Lack of project plan.		
		6	Lack of skills and knowledge in project management .		
		7	Inadequate ICT background for Project Managers.		
2	Top Management Factors	1	Incompetent in making decision on selecting ICT projects.		
3	Technology Factors	1		The design and technology used not inline with the current technology.	
		2		Low quality of the end products.	
		3		Low or no compatibility between new system and the existing systems.	
		4	Insufficient required hardware to interact with the systems.		
4	Organizational Factors	1	Inadequate cost estimation.		
		2	Reduction of Project Cost.		
		3			Lack of ICT manpower in several public agencies.
		4	Full of bureaucracy (especially for decision making).		
		5	Process of project payment not smooth.		
		6			Resistant to adapt to the new systems (not enough time to interact with the systems).
5	Complexity / Size Factors	1	Project too big and complicated (ambitious).		
		2	Unrealistic expectations from the project champion.		
6	Process Factors	1		No feasibility study conducted.	
		2	No project selection process carried out.		
		3		No BPR process conducted.	
		4	No standard methodology in place.		
		5	End user does not involved in user acceptance process.		
		6		User requirement not met.	
		7	No systematic and appropriate project evaluation process.		
		8		Ineffective communication among the vendor and user during requirement gathering.	

5. CONCLUSION

The government's ICT project implementation process is complex, usually requiring simultaneous attention to a wide variety of factors. This kind of study is significant as there are not many studies being carried out in the Malaysian government context. Although this study is far from being extensive, we hope it provides a general idea of ICT project failure symptoms in Malaysian public sector. In general, the finding shows that most of the symptoms were mapped in the 2 types of failure: project failure; and systems failure, and that the 28 symptoms are not unique to the Malaysian government. Major symptoms are focusing on the project management factors and process factors.

From our investigation, one of the government agency that acts as the government's ICT project management office (PMO) is currently adapting a standard project management life cycle and is also in the process of educating the ICT project managers in the public sector by providing internal workshops on project management. This agency has also implemented ICT Project Application and Monitoring System (PAMS) where all agencies involved in ICT project implementation could key-in and produce their project progress report and are being monitored by the PMO.

Prior research [19] concluded that successful deployment of IT solutions in public organizations relies, among other factors, on the presence of clear IT strategic goals and on the efficient integration of IT into government organizational development. Furthermore, in their studies, the findings indicate clearly that the success or failure of such projects is caused by the role of top management rather than technological issues. However, according to our study, one of the major factors that contribute to the project failure is the weakness in project management. We believe that if this factor is addressed, it will help to overcome most of the symptoms in the project management factors and process factors root causes. For example, when the project manager is equipped with appropriate project management and ICT skills, they can better assist their agency and the authorities in term of the project plan and estimation, project evaluation, selection and monitoring process, project risk management, as well as act as a mediator between user and vendor, and overcome related symptoms in project management factors and process factors root causes. With these in mind, the identified failure symptoms and factors will be associated and related to our next investigation of sustainable e-services.

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