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## IT GOVERNANCE AND ORGANISATIONAL PERFORMANCE

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### ABSTRACT

*IT governance as a mechanism to enhance their performance as clearly in the case of E-government in Jordan depended on a good infrastructure in Information and Communication Technology (ICT). This research investigates the Jordanian public sector readiness to implement IT Governance concepts, in order to enhance performance in Jordanian public sector organizations. Quantitative method is adopted for answering the research questions. Factor analysis and PLS path analysis statistics methods were utilized to analyze the data of a field survey of 26 organizations in Jordanian public sector. Findings of the research show that there is an existence of the relationship between IT Governance and its Pillars: accountability, transparency, participation, and predictability. Also the results show that there is a relationship between IT Governance and Performance.*

**Keywords:** *IT Governance, Performance, Accountability, Transparency, Predictability*

### INTRODUCTION

Governance is an economic, political and administrative authority to manage a community's affairs at all levels. It comprises the mechanisms, processes and institutions through which community members and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences (Somuah, 2004). Good implementation of IT Governance can enhance the following issues in the government organizations: accountability, transparency, participation, and predictability. According to Luftman (2004) organizations that don't have a good IT governance model dissipate valuable resources, capital, time and human in an era where time is very important, capital in shortage and talent people are rare. According to Finger and Rossel (2007) e-governance is not anew manner to talk about e-government, but it express another perspective. E-governance deal with the concerns, problems and ways for problem solving among different parties inside the organizations. There is a continuous and necessary readjustment between technological innovation, law and institutional acknowledgement

E-governance phenomenon is the co-evolution between technology (communication technologies in particular) and information from one side and institutions (particularly political institutions) on the other side. IT Governance

system which work in harmony with corporate Governance model considered as an important tool which can be used to enhance the performance in the organizations.

### GOVERNANCE

Governance can be defined as the exercise of ethical corporate behavior by directors or others in the wealth-creation process, as part of how they provide stewardship over the business of the entity. Governance was defined as "A set of responsibilities and practices exercised by the board and executive management with the goal of providing strategic direction, ensuring that objectives are achieved, ascertaining that risks are managed appropriately and verifying that enterprise's resource are used responsibly" (IT Governance Institute, 2005). The organization for Economic Co-operation and Development (OECD, 2008) defines corporate governance as a set of interaction between business management, board of directors, shareholders, and stakeholders. Good governance should allow effective monitoring and effective use of organization resources. The Bank of International Settlements (BIS) define the governance arrangements in Enhancing Corporate Governance in Banking Organizations as surrounding the relationship between management team and governing team to provide

the governing structure to achieve the following objectives:

- The entity's general objectives.
- The ways of achieving those objectives.
- The methods in which performance will be monitored.

Governance is the responsibility of the board of directors to ensure that all resources, including information technology, keep up and extend the organization's strategies and objectives.

### IT GOVERNANCE

IT Governance is an expression used to explain the use of organizational processes to make decisions about how to get and deploy IT resources and competencies (Henderson and Venkatraman, 1993). According to IT Governance Institute (2003) *"IT governance is the term used to describe how those persons entrusted with governance of an entity will consider IT in their supervision, monitoring, control and direction of the entity. How IT is applied within the entity will have an immense impact on whether the entity will attain its vision, mission or strategic goals"*. Luftman (2004) indicated that IT Governance answer the following questions:

- Who has the authority to make decisions (power).
- Why they make decisions (for alignment).
- How they make these decisions (decisions procedure).

Current organizations boundaries are more flexible, dynamic and extensive. Governance framework and criteria are critical in today's business environment especially when the enterprise is global and extends to other entities. According to Henderson and Venkatraman (1999) e-governance is defined as "the use of information and communication technologies in public administrations to improve public services and democratic processes and to strengthen support to policies". IT governance is about assigning decision rights and creating an accountability framework that encourage desirable behaviors in the use of information and technology (Cameron, 2006). According to Sam (2004) defined an e-governance is the Use of information and communication technologies to support good governance. Jim Davies et. al (2007) argued that the focus for electronic government research and practice has been changing over the years. In addition the

increasing awareness that IT investment has to be expressed in terms of creating public value caused the change towards organizational issues, including the alignment of electronic government initiatives with the broad public sector development program. However, the availability of mature, cross-agency public services does not mean that such services will be automatically used and therefore how much public value has been really produced. According to this concept the focus has changed again, currently to social issues, and the area expanded from electronic government – technology – enabled enhancements in government operations, to electronic governance–technology-enabled enhancements in interactions between government and non government actors. Finger and Rossel (2007) argued that e-governance is not a new manner to talk about e-government, but it express another perspective. E-governance deals with the concerns, problems and ways for problem solving among different parties inside the organizations (Syaiful et., al., 2015). There is a continuous and necessary readjustment between technological innovation, law and institutional acknowledgement. E-governance phenomenon is the co-evolution between technology (communication technologies in particular) and information from one side and institutions (particularly political institutions) on the other side. Globalization considered as a main reason for economic competitiveness and liberalization. ICTs come out to be a helpful answer facility for many investments and decision-making processes. IT Governance is part of corporate Governance and they should be aligned. According to IT Governance Institute (2003) and Ofer and Smyrk (2015) the IT Governance framework starts from setting objectives which should be achievable then the process of comparing these objectives starts after that IT activities which help in increasing automation, decrease the costs and managing risks, finally measuring performance and make modification for objectives to enhance performance as shown in figure 1. IT governance, behave similarly as corporate governance actions, both board and executive are work closely, together in establishing directions and in controlling . The lower layers role in the organization are to give important information needed in decision-making and evaluation activities , also they help in evaluating performance measures.

### IT Governance Pillars

To summarize from previous studies and According to Asian Development Bank (1998) the most important pillars of governance are the

followings: accountability, transparency, each one of the pillars and its importance as predictability, Participation. In the following follows: sections there will be a brief description about

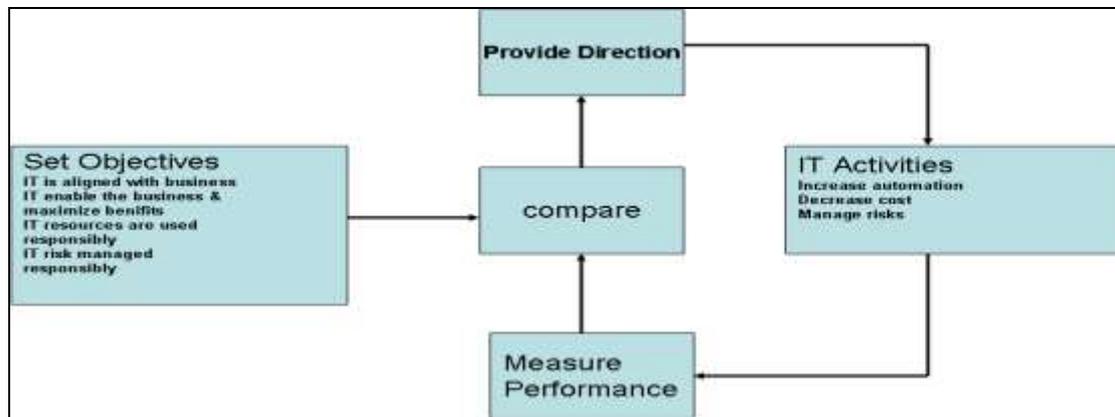


Figure 1: IT Governance Framework, Adapted from IT Governance Institute, 2003

### Accountability (ACC)

It can be defined as the capacity to call officials to account for their actions. Accountability has two parts; the first part is the answerability which means that organization should be ready to answer any question related to official actions. The second part is the consequences which should be a predictable and meaningful, without considering accountability only a time consuming formality. Accountability is the ability to receive answers about questions such as about the decisions that have been taken and an interpretation about these decisions. According to Mulgan R. (2000) Accountability explain the relationship between two parties in which one party, the holder of accountability, has the authority to search for information about, to investigate and to inspect the behavior of another party, the giver of accountability. Accountability is a concept which should be determined in context: *who* is accountable *to whom* and *for what?* (Scott. C, 2000). According to Kim et al. (2005) the Sixth Global Forum describes that: There are an agreement of opinions had formed around reinventing governance rather than reinventing government. Through the existence of networks governments, private sectors, organizations and citizens form a web of relations. In past governance had the same meaning as government but currently with new models of governance, government considered as one of the actors in this model. In other words, although the past form of governing was based on authoritarian states and hierarchical structures. Today governance is based on participatory policy making and a vast network comprising diverse actors. The meaning of Accountability has been extended to openness and transparency

initiatives which intend to make both the control of government by the population and public discussion between citizens and governments easier (Mulgan R., 2000). ICTs considered as an influential tool to enhance control and transparency and to associate people, organizations, information and knowledge. There is an ambition that information and communication technologies (ICTs) will enhance the openness, transparency and accountability of public administrations and bringing people to be closer to governments. Consequently, e-government is considered as a positive channel for enhancing trust in governments (La Porte M. et al., 2000).

### Transparency (TRA)

“Transparency is the deliberate attempt to make available all legally releasable information—whether positive or negative in nature—in a manner that is accurate, timely, balanced, and unequivocal, for the purpose of enhancing the reasoning ability of publics and holding organizations accountable for their actions, policies and practices.” Transparency also entails low-cost access to relevant and material information (Asian Development Bank, 1998). According to Balkin (1999) Transparency divided into three types: informational transparency, participatory transparency, and accountability transparency. Rawlins (2006) argued that transparency is consists of four factors substantial information, participation, accountability, and secrecy (which had a reverse meaning to openness). Transparent organizations must exchange information that permits stakeholders to build informed decisions concerning their relationship with the organization. In an

economic context, a useful definition of transparency is the presence of symmetric information; lack of transparency refers to asymmetric information. The goal of any new corporate governance is to increase the transparency, and this process costs and benefits. The relationship between governance and transparency is obvious in the public and regulators opinion; transparency was increased for the purpose of improving governance (Benjamin et al., 2007). The most important advantage of transparency is that it reduces asymmetric information, and also reduces the cost of trading the organization's securities and the organization's cost of capital (Diamond Douglas and Verrecchia., 1991). Costs of disclosure, as well as the competitive costs are important because the disclosure gives helpful information to product-market competitors (Leuz and PWysocki., 2006). Transparency that organizations need to be applied is part of the public transparency. According to Paul Sturges (2004) the major components of public transparency are:

- Open government and public scrutiny
- Freedom of information laws
- Protection of public interest disclosure
- Financial accountability and auditing

### Participation (PAR)

Friedman (2006) argued that Participatory governance is illustrated as a regulatory framework which is used to run public affairs and it is not exclusively assigned to government and the public administration, but also engage in co-operation between state institutions and civil society groups. It is noticed that the participation of people in giving feedback, making policy in order to make suitable decisions is very important in any organization. Participation needed to obtain reliable information and to serve as reality check and watchdog for the stakeholders. The main challenge to governments in all countries is to change themselves in order to make citizens participate in democratic activities and to improve citizens' dependence in governments (Swedish Association of Local Authorities, 2003). According to Robin Mansell (1998) ICTs considered as a facilitators for participation. ICTs motivate people to enhance their job and achieve it in efficient manner. *"ICTs offer the potential for revolutionary changes in national and regional innovation systems"*. ICTs not only facilitate information exchange, but they are expanding the process, inventing new methods of sharing ideas, and reducing the costs of collecting

and analyzing information. Richard, Riehle. (2007) has mentioned three benefits for ICTs within the framework of governance:

- ICTs work in harmony with the developmental challenges and help in making good governance framework.
- ICTs are considered as an efficient method to reduce costs.
- ICTs can be used to improve the democratic process, make sure effective participation and make governments closer to their human.

ICTs in any organization can enhance employee performance allowing them to communicate with each other and with the organizations electronically such as using E-mails and other electronic media. According to Ermias Wondie (2007) Policymakers can allow organizations to work jointly through networks in order to share resources, skills, and services to compete with others in the global economy and fulfill the needs of their local communities. ICTs can be beneficial to build the rule of law with the aid of computerized databases, communications networks and channels, and GIS's. ICTs participate in Improving yield and reform of internal government administration Such as procurement, human resources, budgeting, planning, evaluation by helping to remove paper from the process or by facilitating coordination and consolidation of information. Also it can help in increasing accountability as well. ICTs can be used to make collaboration between different government departments and facilitate dialogs and remove differences between opposition parties.

### Predictability (PRE)

The investment in the information technology projects need a good governance framework which is dependable and give the investors trust in their decisions that they had taken them. Also they need stable environment, good and clear methods to predict and analyze the market according to stable and clear regulations. According to Asia group (1998) Predictability can be obtained from laws and regulations that are obvious, known previously, and uniformly and effectively enforced. When there is no enough predictability, it will make difficulties for public officials to plan for the provision of services and is an excellent reason for nonperformance. . According to OECD (2008) the rule of law refers to the institutional procedure of setting, understanding and executing laws and other regulations. So decisions that government had taken should be in accordance to

law, in order to make private firms and individuals protected from random decisions. Reliability and predictability needs governance that is strong and doesn't have nepotism, controlled by narrow private interest groups; keep property and personal rights; and achieves some sort of social stability. A degree of reliability and predictability achieved are essential for organizations and persons to take good decisions. Reliability and predictability are not accomplished by more specific the regulations. Effective implementation of individual regulations needs to be counterbalanced by administrative procedure legislation and external reviews of decisions. Reliability and predictability also require certain degree of political stability and try to encourage private sector and convince them that their investments aren't depend on political uncertainty. Transparency and predictability are a matter of concern of investors and governments in order to keep privacy of sensitive information, so regulatory objectives and practices should be made transparent in order to increase the predictability of outcomes.

### Organization's Performance

Performance can be defined as the capability of an entity to produce results in a dimension determined a priori, in comparison to a goal. Thus it is important to have, first, an object whose performance is to be considered; second, a dimension in which one is prefer ; and, third, a set target for the result. The existence of these three parts ensures that performance as defined above does exist (Laitinen, 2002). An efficient system of performance measurement may be the powerful method at management's disposal to enhance the probability of successful strategy implementation (Lynch et.al, 1991). Measuring and improving performance is a key to ensuring the successful implementation of organization strategy (Laitinen, 2002). When financial and non- financial measures are included in the same performance model, managers can survey performance in several areas simultaneously in order to facilitate efficient strategic decision making. According to IT Governance institute (2005) governance model should provide the structure and practices for an enterprise to do the following:

- Goals, objectives and expectations are determined (plan and organize).
- Methods that can be used to reach those objectives through enterprise activities and utilization of the enterprise's

resources are determined (acquire, implement, deliver, and support).

- Construct a method for Monitoring and reporting performance (monitor and control).
- Build an efficient structure and sufficient accountabilities for effective governance.

IT Governance Institute (2003) emphasized that, the main benefit of IT governance is to help IT activities, to guarantee that IT's performance achieve the following objectives:

- Aligning IT with enterprise and realizing the expected benefits.
- Making IT as an enabler to the enterprise.
- Accountable use of IT resources.
- Suitable management of IT-related risks.

According to IT institute (2003) the board of organizations can measure performance by the following methods:

- Defining and monitoring measures with management to ensure that objectives are accomplished and to measure performance in order to get rid of surprises.
- "Leveraging a system of balanced business scorecards maintained by management."

### Non Financial Metrics

Many organizations use financial metric to evaluate the value of their projects over time and cost such as net present value (NPV) and the internal rate of return ( IRR) (visitacion,2003). Recent Strategy has taken new shape because organizations contain intangible and hidden assets to be in a competition with others in the information-based global Economy. Means of value creation has changed from tangible to intangible assets, and traditional financial measures can't be used to evaluate intangible assets. The traditional dimensions and measures used in executive decision making to measure the performance of an organization are financial. Many of the opinions prefer the non-financial measures because of some disadvantages of financial measures. Some of financial measures disadvantages are encourage short-termism, a lack of strategic focus, and local optimization; they also encourage managers to minimize any variance from the standard rather than seeking continual improvement, and they fail to provide information on what customers want and how competitors are performing (Neely, 1999). According to Kaplan (1984) the financial

measures generated by traditional cost accounting systems provide an inadequate summary of a company's manufacturing operations. Today's global competition requires that non-financial measures - on quality, inventory levels, productivity, flexibility, deliverability, and employees. Also be used in the evaluation of a company's manufacturing performance. According to Drury (1990) new performance measures are the non-financial and concentrate on the following factors such as quality, reliability, and flexibility and delivery performance. Bhimani (1994) also claimed that the importance of considering non-financial information is very important and that practical proof proposes a rising role for this kind of information in enterprise management. Non financial benefits may come as an improvement of customer satisfaction, reduced defects, increased market share. To summarize the previous studies, the non-financial metrics are more important than financial metrics that can be used as indicators for measuring performance in the organizations. The most important non-financial metrics are: Customer satisfaction, Product quality, Delivery, Reliability, Flexibility, Reducing defects, creating culture for the business, increasing market share

### Research Model and Hypotheses

#### The Research Model

According to the previous studies, IT Governance (ITG) and Performance, researchers suggest and develop a model to indicate the relationship between these elements. In this study the researcher study how the IT Governance enhance the performance in the public sector organizations. Performance of the organization studied as a dependent variable from one side with the IT Governance as an independent variable. Some researchers study one or some of IT Governance (ITG) pillars. In this research a comprehensive study achieved which take into consideration the entire integrated IT Governance (ITG) pillars. They were searched as the independent variables as shown in figure 2 as follows: Accountability (ACC), Participation (PAR), Transparency (TRA), and Predictability (PRE). Performance of any organization is the capability to achieve objectives. There are two features taken into consideration when measuring the performance of any organization: financial measures which are mainly discuss the profit that organization can achieve and non-financial measures which discuss measures other than

financial that organization may achieve such as customer satisfaction, quality enhancement ...etc. Figure 2 shows our research model, which is divided into two sections: the first section discuss the relationship between IT governance from one side and its pillars accountability, transparency, participation, and predictability from another side. The second section discuss the relationship between IT Governance as an independent variable and the Performance as a dependent variable. The researchers select the Jordanian Public Sector and try to prove these relationships.

### THE RESEARCH HYPOTHESES

*Hypothesis 1: There is a significant relation between IT Governance and Accountability.*

*Hypothesis 2: There is a significant relation between IT Governance and Transparency.*

*Hypothesis 3: There is a significant relation between IT Governance and Participation.*

*Hypothesis 4: There is a significant relation between IT Governance and Predictability.*

*Hypothesis 5: There is a significant relation between IT Governance and Performance.*

### RESEARCH METHODOLOGY AND ANALYSIS

To test the proposed research model, researcher adopted the survey method for data collection, and examined our hypotheses by applying the partial least squares (PLS) and path analysis method.

#### Measurement and Data Collection

We developed the items in the questionnaire either by adapting measures that had been validated by other researchers or by converting the definitions of constructs into a questionnaire format. Research approaches are divided into two major kinds: quantitative and qualitative which refer to the type of the data gathered and the investigation that is used on that (Yin, 1994). Research philosophy contains significant suggestions about the way in which the world is viewed. These suggestions will show up the research strategy and the methods that should be chosen as part of that strategy (Saunders, M. et al., 2007) .we use in our research quantitative approach , which consists of a survey about properties and variable and their relations; where features are classified, analyzed, and statistical models are constructed to justify what is observed.

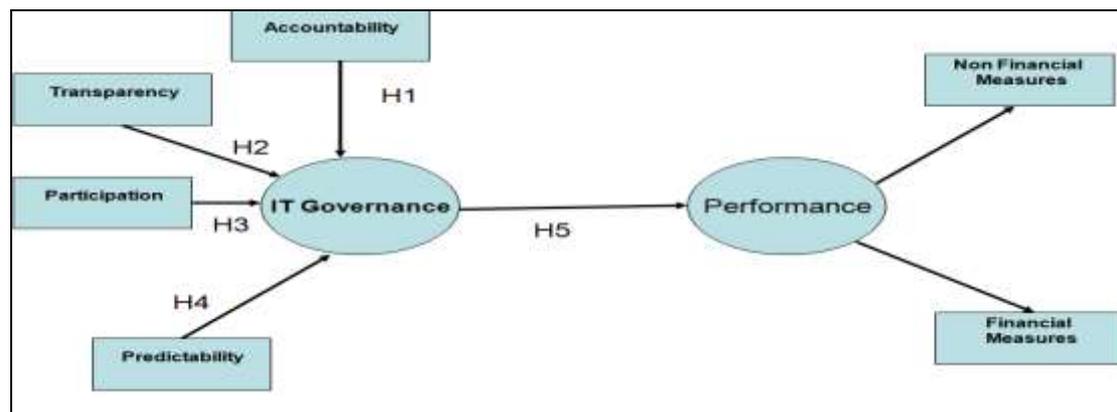


Figure 2: Research Model

Quantitative research begins from a specified hypothesis that must be proved or disproved. According to Brown and Lloyd (2005) Quantitative Approach use large random samples that is representative of the general population. Quantitative analysis results can be generalized to a larger population and make the comparison of different attributes very easy (LAMEL, 2007). Researchers who apply logical positivism or quantitative research use experimental methods and quantitative measures to test hypothetical generalizations (Hoepfl, 1997). Also researchers emphasize the measurement and analysis of causal relationships between variables (Denzin and Lincoln, 1998). Quantitative methods collect numerical data and analyze it using statistical methods (Myers M.D, 1997). Quantitative approach usually uses a deductive approach where the authors build up a theory and hypothesis and design a research strategy to test the hypothesis (Saunders M. et al., 2007). According to Kruger (2003) quantitative approach permit to summarize large numbers of information sources and Capability comparisons across and over time.

### The Sample of the study

Enhancing the Jordanian public sector performance considered as one of the most important issues that government concentrate on Jordan consider one of the most active countries in the middle east that has a large evolution in the information technology ,which is mainly used to enhance the quality of services that introduced through different types of agencies . Researcher chose in his study the Jordanian public sector as the target population because there are a lot of IT projects executed yearly in different type of organization, so it is suitable to investigate Because the e-government in Jordan has a good infrastructure and go forward in advance steps in most organizations and their services, so it is very important to see also how IT Governance is vital

in enhancing the public sector performance. There were 26 organizations had been chosen as samples for this study questionnaire was prepared in both English and Arabic languages and distributed to the targeted people on these organizations. According to Yin (1994), the role of reliability is to minimize the error and biases in a study. Also Reliability refers to the extent to which your data collection techniques or analysis procedures will yield consistent findings (Saunders M. et al., 2007). Cronbach's alpha is one of the methods that used for measuring the consistency reliability (Saunders M. et al., 2007).

### Operationalisation of the Independent Variables of the Research Model

As indicated by Referring to some authors, whom they explained the importance of IT Governance (ITG) pillars and its importance in enhancing performance of organizations , particularly non – financial. The researchers use in this phase SPSS tools to check the reliability of the data.

#### Accountability

The Factor analysis showed a one-factor solution of Accountability(ACC) construct , the loading factor range from 0.822 to 0.727 with average loading for the factor 0.775, this factor explains 60.180% of total variance, and the factor has eigenvalue greater than 1 .The factor analysis demonstrate an obvious discriminate validity because all items are loaded on one factor, and Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was 0.836 which show that the sample is enough to achieve this test, reliability was calculated based on Cronbach's alpha, the measure was 0.83 which demonstrate a reasonable reliability for accountability.

#### Transparency

The Factor analysis for the refined items which have loading greater than 0.5 showed a one-

factor solution of Transparency(TRA) construct , the loading factor range from 0.764 to 0.692 with average loading for the factor 0.629, this factor explains 53.31% of total variance, and the factor has eigenvalue greater than 1 .The factor analysis demonstrate a obvious discriminate validity because all accepted items are loaded on one factor, and Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was 0.695 which show that the sample is enough to achieve this test, reliability was calculated based on Cronbach's alpha, the measure was 0.707 which demonstrate a reasonable reliability for transparency.

### Participation (PAR)

The Factor analysis showed a one-factor solution of Participation(PAR) construct , the loading factor range from 0.793 to 0.656 with average loading for the factor 0.712, this factor explains 50.964% of total variance, and the factor has eigenvalue greater than 1 .The factor analysis demonstrate an obvious discriminate validity because all items are loaded on one factor, and Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was 0.849 which show that the sample is enough to achieve this test, reliability was calculated based on Cronbach's alpha, the measure was 0.805 which demonstrate a reasonable reliability for participation. Table 3 shows the results of participation.

### Predictability (PRE)

The Factor analysis for the other 4 items which have loading greater than 0.5 showed a one-factor solution of Predictability(PRE) construct , the loading factor range from 0.822 to 0.758 with average loading for the factor 0.796, this factor explains 63.454% of total variance, and the factor has eigenvalue greater than 1. The factor analysis demonstrate a obvious discriminate validity because all accepted items are loaded on one factor, and Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was 0.748 which show that the sample is enough to achieve this test, reliability was calculated based on Cronbach's alpha, the measure was 0.806 which demonstrate a reasonable reliability for PRE.

### Performance

Refinements done with two iterations, the undesirable variables are eliminated. The final factor analysis showed loading factor range from 0.834 to 0.619 and the average loading for the factor is also enhanced to be 0.756, this factor explains 57.679% of total variance, and the factor has eigenvalue greater than (1). The Kaiser-

Meyer-Olkin (KMO) Measure of Sampling Adequacy was 0.858 which indicate that the sample is adequate to perform this test, reliably was calculated based on Cronbach's alpha, the measure was 0.849 which shows a reasonable reliability for Performance measures for non-financial measures (PERFN1).

### Partial Least Squares (PLS) Product Indicator Approach For Measuring Interaction

The capability to find and precisely estimate the strength of interaction effects are significant concerns that are essential to social science research generally and for IS research in particular (Chin, W. et al., 1996). In IS discipline, a large number of research has been dedicated to investigate the conditions and contexts under which relationships may vary, often under the general umbrella of contingency theory (McKeen, Guimaraes, & and Wetherbe, 1994). The traditional methods such as analysis of variance (ANOVA) and moderated multiple regression (MMR) face problems resulting from measurement error and the low statistical power that can result from such error. Traditional techniques may not be able to detect interaction effects. The problems that happened with the traditional methods are solved in this research by discussing a new latent variable modeling approach that can provide more precise estimates of interaction effects by accounting for the measurement error in measures which attenuates the estimated relationships (Chin et al., 1996). To solve difficulties that face traditional methods such effects of measurement error, researcher in this study use product indicator approach in conjunction with Partial Least Squares (PLS). The predictor, moderator, and dependent variables used with traditional methods, viewed with the PLS method as latent variables (i.e., constructs) which cannot be measured directly. in PLS product Each set of indicators reflecting their underlying construct (i.e., latent variable) then submitted to PLS for estimation resulting in a more accurate assessment of the underlying latent variables and their relationships. According to (Chin W. and Gopal A., 1995) The PLS procedure become a well-known and use among IS researchers in recent years because of its ability to model latent constructs under conditions of non-normality and small to medium sample sizes. PLS is similar to regression as a components-based structural equations modeling technique, but simultaneously models the structural paths (i.e., theoretical relationships among latent variables) and measurement paths (i.e., relationships between a latent variable and

its indicators). Rather than assume equal weights for all indicators of a scale, the PLS algorithm allows each indicator to vary in how much it contributes to the composite score of the latent variable (Chin, W. et al., 1996) indicators with weaker relationships to related indicators and the latent construct are given lower weightings. In this sense, PLS is more preferable than other techniques such as regression which assume error free measurement (Lohmöller, 1989). PLS is considered as a suitable technique for explaining complex relationships (Fornell C. and Yi, 1992). According to Chin (1998) PLS was used as technique which allows latent constructs to be modeled either as formative or reflective indicators. Additionally it makes minimal demands in terms of sample size to validate a model compared to alternative structural equation modeling techniques. The researcher use in the analysis a tool called SmartPLS 2.0 project which is located at the school of business at the University of Hamburg in Germany. SmartPLS 2.0 can be used in business research for the creation of path model and the measurement using partial least square approach. SmartPLS 2.0 redesigned to use java Eclipse platform technology. SmartPLS allows creating and measuring a path model and evaluating the results. As indicated by Ringle, & Wende, (2005) there is also additional functionalities can easily

add them to the SmartPLS 2.0 java Eclipse Plugins (. All results of SmartPLS 2.0 that made to this research are shown in figure 3

**HYPOTHESIS TESTING**

A number of techniques used to assess the hypotheses of the model. the first method is the overall coefficient of determination (R square value ) which is An indicator to measure the degree that the model fits the data, if the value of *R-square* close to 1.0, this indicates that the model accounted for almost all of the variability with the variables determined in the model. And if the R-Squared is 0.0, this means that one term doesn't assist you to know the other term. The second technique is using standardized estimation coefficients (beta). Standardized regression coefficients (beta coefficients, beta weights) are usually used in quantitative social sciences. They are used for many purposes: selecting variables, determining the relative importance of explanatory variables, comparing the effect of changing different variables, and so forth (Johan, .B , 1994). When the value of beta closes to zero, it means that the relationship is weak, but when the value of beta increased, this means the relationship is strong. Table 6 shows the results of the evaluation test for the data used in building research model.

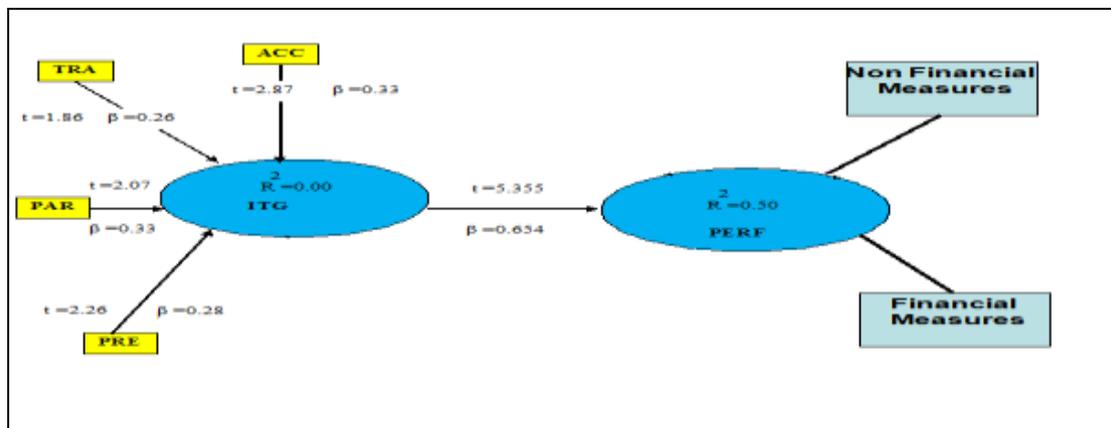


Figure 3: Results of PLS Analysis

**IT Governance and Accountability**

There is a significant relation between IT Governance and accountability

**H1: ITG and ACC:  $ITG = \beta (ACC) + \epsilon$**

Accountability was hypothesized to be positively associated with IT Governance. According to the questionnaire results and SmartPLS analysis, beta was found to equal 0.33 which indicates the existence of positive significant relationship

**Analysis of Measurement Model (Result of ITG construct)**

Four hypotheses were presented with respect to this construct. Each one of these hypotheses has a number of independent parameters; namely accountability, transparency, participation and prediction. These parameters were hypothesized to have relationships with dependent variables IT Governance. The associations were tested and the results were interpreted and conclusions are made.

the hypothesized model was significant with a value of 2.07. This indicated that participation is part of IT Governance which corresponds with the writings of a large number of authors, such as Richard Heeks (1998), Friedman (2006), Richard Heeks (1998) and Robin Mansell (1998) who considered participation to be one of the most important pillars of the IT Governance. The coefficient of determination (R Square) of the participation was equal to 0.51, which means that 51% of the total variance in the participation was accounted for the IT Governance, see table 3.

#### IT Governance and Predictability

There is a significant relation between IT Governance and predictability

$$\text{H4: ITG and PRE: ITG} = \beta (\text{PRE}) \text{ITG} = \beta \text{PRE} + \varepsilon$$

Predictability was hypothesized to be positively associated with IT Governance. Based on the survey results and SmartPLS analysis, beta was found to equal 0.28 which indicates the existence of positive significant relationship between predictability and ITG, and the t-value of the hypothesized model was significant with a value of 2.26. This indicated that predictability is part of IT Governance which corresponds with the writings of a large number of authors, Asia group (1998) and OECD (2008) considered predictability to be one of the most important pillars of the IT Governance. A comprehensive examination of the questionnaire statements discovered that the highest priority had been given to the laws and regulations availability which help in investment prediction in IT field, which is one of the recommendations set by Asia group (1998). The next concern is the Decisions taken depend on laws and regulations, which was recommended by OECD (2008). The third concern is using modern technology helps in prediction process, which was emphasized OECD (2008). The fourth concern is that the existence of stability in circumstance environment help in success of IT projects, which emphasized by Asia group (1998). The coefficient of determination (R Square) of the participation was equal to 0.64, which means that 64% of the total variance in the participation was accounted for the IT Governance, see table 4.

between accountability and ITG, and the t-value of the hypothesized model was significant with a value of 2.87. This indicated that accountability is part of IT Governance which corresponds with the writings of a large number of authors, such as La Porte M. et al., (2000), Asian Development Bank(1998) , Mulgan R.(2000) who considered accountability to be the most important factor in the IT Governance pillars. The coefficient of determination (R Square) of the accountability was equal to 0.61, which means that 60 % of the total variance in accountability was accounted for the IT Governance, see table 1.

#### IT Governance and transparency

There is a significant relation between IT Governance and transparency

$$\text{H2: ITG and ACC: ITG} = \beta (\text{TRA}) \text{ITG} = \beta \text{TRA} + \varepsilon$$

Transparency was hypothesized to be positively associated with IT Governance. According to the questionnaire results and SmartPLS analysis, beta was found to equal 0.26 which indicates the existence of positive significant relationship between accountability and ITG, and the t-value of the hypothesized model was significant with a value of 1.86 at 0.1 significance level. This indicated that transparency is part of IT Governance which corresponds with the writings of a large number of authors, (Diamond Douglas and Verrecchia., 1991), Rawlins (2006), Johnston (1997), (Benjamin E. Hermalin and Michael S. Weisbach., 2007) who considered transparency to be one of the most important factor in the IT Governance pillars. The coefficient of determination (R Square) of the transparency was equal to 0.53, which means that 53 % of the total variance in accountability was accounted for the IT Governance, see table 2.

#### IT Governance and Participation

There is a significant relation between IT Governance and participation

$$\text{H3: ITG and PAR: ITG} = \beta (\text{PAR}) \text{ITG} = \beta \text{PAR} + \varepsilon$$

Participation was hypothesized to be positively associated with IT Governance. According to the questionnaire results and SmartPLS analysis, beta was found to equal 0.33 which indicates the existence of positive significant relationship between participation and ITG, and the t-value of

Table 1: Test Statistics and the Result of Hypothesis H1

Regression Path	Test statistics		Results
	Standardized Beta	t-test	
ACC → ITG	0.33	2.87	Accepted

Table 2: Test Statistics and the Result of Hypothesis H 2

Regression Path	Test statistics		Results
	Standardized Beta	t-test	
TRA → ITG	0.26	1.86	Accepted

Table 3: Test Statistics and the Result of Hypothesis H3

Regression Path	Test statistics		Results
	Standardized Beta	t-test	
PAR → ITG	<b>0.33</b>	<b>2.07</b>	Accepted

Table 4: Test Statistics and the Result of Hypothesis H4

Regression Path	Test statistics		Results
	Standardized Beta	t-test	
PRE → ITG	0.28	2.26	Accepted

### Structural Model

With an adequate measurement model and an acceptable level of multicollinearity, the proposed hypotheses were tested with PLS. The results of the analysis are depicted in Figure 3 and summarized in Table 6.

### Performance and its relation with IT Governance

There is a significant relation between ITG and Performance

**H5: ITG and PERF:  $PERF = \beta (ITG) + \epsilon$**

Performance was hypothesized to be positively associated with ITG. According to the SmartPLS which analyze path analysis and results were obtained, beta was found to equal 0.65 which

indicates the existence of positive significant relationship between ITG as an independent variables and Performance as a dependent variables, and the t-value of the hypothesized model was significant with a value of 5.36. This indicated that IT Governance enhance organizations Performance which corresponds with the writings of a large number of authors such as Board Briefing on IT Governance institute (2003) and Board Briefing on IT Governance institute (2005). The coefficient of determination (R Square) of the Performance was equal to 0.50, which means that 50% of the total variance in the Performance was accounted for the IT Governance

Table 5: Test Statistics and the Result of Hypothesis H5

Regression Path	Test statistics		Results
	Standardized Beta	t-test	
ITG → PERF	0.65	5.36	Accepted

Table 6: Path Analysis

Regression path	Test statistics	
	Standardized Beta ( $\beta$ )	t- test
<b>Measurement Model</b>		
ACC - ITG	0.33	2.87
TRA - ITG	0.26	1.86
PAR - ITG	0.33	2.26
PRE - ITG	0.28	2.13
<b>Structural Model</b>		
ITG - PERF	0.65	5.36

### THE RESEARCH IMPLICATIONS

The findings of the study have explained a number of implications that considered as an important for the Jordanian public sector. Research contributes to encourage Ministry of

Public Sector Development and the managers of public sector in Jordan to a more considerate to IT Governance and Performance climate as follows:

Jordan government establishes a good technological infrastructure to apply the concept of e-government. IT Governance one of the important issues that should go with the e-government, so a great consideration should be given to the IT Governance and the importance of its pillars. Accountability should be given a great attention in public sector organization, and it gives a good answerability which means that organization should be ready to answer any question related to official actions. transparency also one of the important issues that should be emphasized and encourage through Jordanian organizations because Transparency is the deliberate attempt to make available all legally releasable information—whether positive or negative in nature—in a manner that is accurate, timely, balanced for the purpose of enhancing the reasoning ability of publics and holding organizations accountable for their actions, policies and practices.” participation should be encouraged in Jordanian public sector organizations Ministry of Information and Communications Technology is responsible for building good infrastructure to guarantee participation of all parts through advanced technological medias. Predictability is one of the important pillars that should be emphasized in Jordanian public sector organizations in order to encourage the investment in the IT field. All decisions should depend on laws and regulations that adopted in Jordan in order to give the investors the trust and the ability to analyze and predict the future.

Enhancing performance in Jordanian public sector through a good implementation of IT Governance is one of the most important issues that government and manager should concentrate on. Ministry of Public Sector Development is responsible for these issues and should a great attention to this point by cooperating with ministry of Information and Communications Technology in encouraging organizations to apply good IT governance which aligned with the corporate Governance model. Performance not means to concentrate only on financial measures, but also to give great importance to the non-financial measures such as customer satisfaction and quality improvement and so on.

### CONCLUSIONS

Firms should take into considerations the importance of IT governance and its pillars accountability, transparency, participation and predictability in enhancing their performance. Given the importance of IT Governance in today’s world—and even more so in future we

hope that our findings will be useful to others and urge them to support next researches in the IT Governance field, and its role in enhancing the Information Technology Portfolio Management

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