

Innovation-Led Benefit Approach to IT Governance

Amit Ghildyal, Elizabeth Chang, and Sazia Parvin

Abstract—This paper is to present a new enterprise IT Governance model through construction of an innovation-driven benefit realisation framework. The framework is to address two common challenges facing to the enterprise, namely: 1) challenges associated with the understanding Benefit which lead to the difficulties in the adoption of the Benefit models and measurement of the benefit and 2) challenges associated with a lack of innovation approach to achieve the enterprise benefit and appreciation of IT investment.

Index Terms—IT governance, human productivity, enterprise performance, benefit models, innovation-driven benefit framework.

I. INTRODUCTION

IT Governance in the private sector is focused on Return on IT investments to achieve maximum business value and benefit. There are clear measures of the Value and Benefit through quantisation of productivity, profit margin, market capitalisation, or revenue growth etc. However, in the public sector, the enterprise is focused on better service deliveries, enterprise performance and corporate social responsibilities. In this paper, we compare and contrast of IT governance models used in the private sectors, followed by laying out the key challenges for the public sector in the adoption of these traditional Benefit models for IT governance and to overcome these challenges; we present a new practical innovation-drive Benefit Realisation Framework for the IT Governance for public sector.

II. EFFECTIVE IT GOVERNANCE

IT Governance involves effective management of IT procurement, installation, implementation, maintenance of IT systems, infrastructures, tools, as well as trainings for the benefit of business processes improvement, human productivity, customer relationship management, and enterprise performance. Dintrans *et al* [1] IT governance includes:

- 1) Aligning IT to business objectives
- 2) Defining IT Governance objectives
- 3) Establishing IT Value Chain across disciplines
- 4) Identify IT governance control practices
- 5) Establishing continuous improvement of IT governance model

The above five key imperatives for effective IT

governance [1] are illustrated below:

- 1) Align IT Governance with Corporate Governance or Business Objectives: this aligns IT risk management with corporate management risk for deriving business insights by maintaining IT security standards. The main objective of this step is to fulfill business objectives through achieving greater return on investments, and reducing business risks helps deliver business benefits.
- 2) Define IT Governance Objectives Around Strategic Alignment, Value Delivery, Risk Management, Resource Management and Performance Management: IT governance objectives should be defined along the following dimensions [1] as:
 - “Strategic alignment: Align IT strategy with business strategy, and ensure advancement of business priorities”
 - “Value delivery: Maximise value of IT investments”- [1]
 - “Risk management: Identify and mitigate IT risks in a timely manner”
 - “Resource management: Ensure availability of appropriate IT resources to meet current and projected business demand”
 - “Performance management: Monitor IT performance effectively”- [1].
- 3) Establish Holistic Governance Across Disciplines Spanning the Entire IT Value Chain: The main intention of the IT governance model is to focus on establishing oversight and control across all key IT governance disciplines. There is a linkage between benefits and impacts that is required to implement IT governance for gaining business performance.
- 4) Identify the Appropriate IT Governance Control Practices to help achieve IT governance objectives. There are four practices to control IT Governance to achieve the governance objectives. These are as follows:
 - Governance bodies/committees: “Control body or committee to help mandate compliance with IT governance objectives (e.g., an architecture review board)” [1]
 - Governance meetings and surveys: “Formal meetings/established surveys to monitor and track compliance with IT governance objectives (e.g., business satisfaction survey)” [1]
 - Documentation controls and repositories: “Mandating documentation or storage in central repositories for establishing IT governance controls (e.g., a vendor information repository”. [1]
 - Approvals and control checks: “Adequate approvals and process checks to ensure compliance with IT governance objectives (e.g.,

Manuscript received September 25, 2016; revised January 4, 2017.

Amit Ghildyal is with Australian Defence, Australia (e-mail: a.ghildyal@defence.gov.au).

Elizabeth Chang and Sazia Parvin are with the UNSW@ADFA, Australia (e-mail: {e.chang; s.parvin}@adfa.edu.au).

UAT signoff before production implementation)”. [1]

- 5) Establish Continuous Tracking, Monitoring and Improvement of the IT Governance Model: Organisations should prioritise government practices in order to achieve maximum benefits from IT Governance. Organisations should focus on continuous planning, monitoring and tracking improvement in order to ensure the objectives of implementing IT governance.

Peppard [2]’s IT governance incorporates ‘problem-based solutions through innovation to drive solutions for business performance. Common problems with IT governance include project deliverables, cost/budget, timelines, and quality of services. Often the key issue is related to the costs which would normally far exceed the original budget, and to address this key issue; Peppard states an innovation in IT governance is needed. However, innovation for many non-IT industry or business is just an abstract concept, which is difficult to achieve.

Wu *et al* [3] proposed a nomological model showing how organisational performance and business value is created through IT governance, which includes 3 parts, namely:

- 1) IT Governance mechanism including decision making structure, formal process and communication approach,
- 2) IS Strategic Alignment including alignment of product, quality and market strategies,
- 3) Organisation Performance including finance, operation excellence and customer perspective.

Wu *et al* explains the causal affect - that the positive impact of well-designed IT governance mechanisms enables IS strategic alignment, which in turn improves organisational performance, especially operational excellence and customer attentiveness. The traditional quantitative and qualitative surveys are required to help measure the benefits of organisational performance from the customer’s perspective, along with operational excellence, and financial returns.

Our study shows that these models are suitable for the private sector, small-median enterprises or semi-government sectors, because its business orientation and finance return focused measurements, where in the public sectors, the better customer/citizen services, workforce efficiency and product effectiveness are the key focuses.

III. KEY ISSUES IN IT GOVERNANCE

Government agencies are one of the biggest consumer for IT industry, and they constantly and continuously procure, deploy, consume and upgrade varied and large IT systems, platforms and infrastructure, with the aims to improve the performance of government agencies through proper IT governance. But there had been a lack of effective IT governance and control which had led to siloed solutions for most of public enterprises; and that inefficiencies and waste were evidenced by a costly and complex application landscape that limited flexibility and ‘locks’ data into systems [4], [5]. Peever *et al* provided 2015 government sponsored review of typical large Federal Government agency had more than 2500+ communication and management systems or applications which had led to siloed workforce, siloed operations, siloed data management

systems, siloed reporting facilities and siloed enterprise; proven inefficiencies and waste of human and financial resources to integrate data, information, people and enterprises.

Therefore, the top key issues in the public sector of IT governance are:

- 1) Siloed IT systems lead to siloed enterprises
- 2) Poor IT infrastructure lead to poor operation efficiency and poor services quality
- 3) Poor IT solutions lead poor employee and customer satisfactory
- 4) Poor IT contract and procurement lead to budget overrun over 200% and time delay over 2 years on average

The key questions are:

- 5) How can we have better IT systems, infrastructure and solutions through better IT governance?
- 6) How can we measure the Benefit of IT Governance?
- 7) How can we achieve human and enterprise performance?

Bovaird also highlighted performance reporting in public sector organisations is multifaceted and there is no one way of representing performance. “What good looks like” tends to differ substantially between different stakeholders. Under these circumstances, it would be difficult to obtain organisational performance measures (and manage performance) that could directly relate to IT governance.

Flyvbjerg [6] discussed IT governance and focused particularly on IT project which are riskier, and referred to as “black swans”. These are also high impact-events that are rare and unpredictable but in retrospect not so improbable. They give an example of a \$5 million ICT procurement project leading to a loss of almost \$200 million and the nature of the IT projects are complex and large touching all parts of an organisation, and that is posing a singular risk. “Black swans” can be stress tested by the top leadership by asking the following two questions:

- 1) Is the company strong enough to absorb the hit if its biggest technology project goes over budget by 400%?
- 2) Will the company accept if only 25% to 50% of the projected benefits are realised?
- 3) Can the company take a hit if 15% of its medium-sized tech projects exceed cost-estimates by 200% [6]?

IV. THE BENEFIT MODELS FOR IT GOVERNANCE

Weil and Ross [7] state that executives often feel frustrated, insecure, bewildered, and even angry about the high cost of IT and its limited measureable benefits. According to Weil and Ross, information and IT are the least understood as the key assets for the enterprise and those enterprises that poor IT governance or govern IT by default more often find that IT sabotages business strategy.

Ward and Taylor *et al* [8] proposed an IT Governance though a process model of benefits management, and give a basic guideline for benefit management, including multiple iterative processes of the following steps:

- 1) Identifying and structuring benefits,
- 2) Planning benefits realisation
- 3) Executing the benefits realisation plan
- 4) Evaluating and reviewing results

5) Potential for further benefits.

Our research finds that the key challenge is to identify the benefit. The questions would include:

- 1) Who (supplier or buyer) will be best to define the benefit?
- 2) Who will be the subject matter expert in the context of business or operation to identify the benefit?
- 3) Who will be the IT expert within or outside the enterprise to help define the benefit?

Remenyi and Sherwood-Smith [9] proposed an Active Benefit Realisation (ABR) process for IT governance and proposed a continuous evaluation approach to management of information systems' development, including a feedback loop of following processes:

- 1) Initialisation of the project
- 2) Production of a picture
- 3) Agreement to proceed
- 4) System development
- 5) Evidence collection
- 6) Review and learning
- 7) Development of updated pictures, including future maintenance project and abandon project.

The IT governance process focuses on project management as a means of identifying, defining, monitoring and delivering business benefits as a result of an information system development opportunity. The authors also state that through a high degree of openness with information systems professionals playing a co-evolutionary role with line managers and users, as well as financial staff and sometimes customers and other sponsors, more effective information systems may be developed. Central to this collaboration is the inclusion of a feedback loop which will allow appropriate interventions to take place during information systems development and management, leading to a much higher degree of information systems success.

One of key issues of adopting Benefit Approaches to IT governance is that organisations often have limited understanding of the Benefits, including:

- 1) Who will be the subject matter expert (Business expert or IT expert or strategist etc.) to define the benefit?
- 2) The accountability of the benefit realisation, and who is responsible.
- 3) The expert to measure benefit from IT investment and deliverables in-line with enterprise goals.
- 4) Defuzzification of the concept of benefits so that the whole organisation can understand and appreciate the IT investment and take over.

V. THE INNOVATION BASED BENEFIT FRAMEWORK AND ITS APPLICATION TO ICT PROCUREMENT

To address the identified issues in the previous section, we have developed a practical approach to Benefits Realization for IT Governance, known as Innovation-led Benefits Framework for IT Governance, which is shown in Fig. 1.

The benefits framework involving four parties, namely:

- 1) The beneficiary or the enterprise or the user, or the procuring organisation;
- 2) The provider, who provides IT services, systems and technology.
- 3) The Contract officers who ensure the benefit is

measurable and build into the contract;

- 4) Subject matter experts or advisors who can be utilised or involved in IT governance and to help realisation the defined Benefits.

The providers are normally subject experts who should understand the benefit of IT products and services to the operation or business, who are in the position to define the benefit from the IT goods and services point of view. This is often neglect by the organisation, who think they all everything about IT.

The beneficiary, the enterprise, the end-user can help define the benefit from the business objective and process point of view. By combining the above two perspectives, the organisation or enterprise should set up a contract with the IT providers for the provision of quality and quantity of IT goods and services.

The Contract officers that in the interest of each party, develop the contract that associate Benefit that is understood, implementable, measurable and deliverable to all parties. This is often poorly completed or poorly understood in the enterprise, which leads to poor IT investment resulting in poor people and poor organisational performance.

The subject experts from other Enterprise or Academia can help provide peer opinion and ensure IT return on-investment, and also advice on best-practice using its research, experience or world-wide practice and knowledge-base.

It is important to consider the collaborative effort in the alignment of the business expertise (business processes, organisational goals, and problems) with the IT expertise within the IT governance model, that is, understands benefits and its realisation processes and measurement under the contract. When this alignment occurs, it will help achieve benefits through an ongoing innovative loop as shown Figure 1 and through the joint effort between all four parties involved in the cooperative work on the continuing understanding and improvement of Benefits definitions, benefit measurements, human and organisation performance metrics, IT goods and services specifications, and user requirements, a joint continuous "innovation" loop for better and efficient IT governance.

It is noted that the "innovation" loops are empowered by "innovation" programs of external research agencies such as other enterprise experience, industry R&D, academia, centers of excellence, and crowd sourcing. These are value for money resources that are often neglect by the enterprise in IT governance.

In this framework, we bring about a partnership of multiple stake holders or organisations together to achieve better IT governance and with the organisation that embrace emerging technology and desires ICT-led change for efficiency and effective of IT investment. Particularly, in ICT procurement, this framework could be used for setting-up an innovation-led approach through collaboration between government, industry and academia for Benefits realisation.

The proposed Innovation-led benefits IT Governance framework incorporates an innovation decision loop in a highly integrated iterative, recursive and continuous improvement environment, supports collaboration of multiple stake holders for opportunity to innovate and develop workable solutions for enterprise. One could use the

theory of transaction-cost economics [10] the contracting for a flexible framework for contracting that benefit to providers and buyers or beneficiaries. The cooperative and collaborative Innovation loop framework allows sharing of information leading to reduction of cost and increased benefit of enterprise. According to [11]-[13], trade exchanges will benefit from being of an ongoing inasmuch as all complex contracts are incomplete, additional gains can be realised if

order-preserving mechanisms are devised that enable the parties to preserve cooperation during contract execution. Williamson quotes Karl Llewellyn - "contract as framework" - and contrasts it with the more familiar concept of "contract as legal rules". The "contract as framework" approach has been used to realise additional gains through order-preserving mechanisms (ongoing contract) and by preserving cooperation during contract execution.

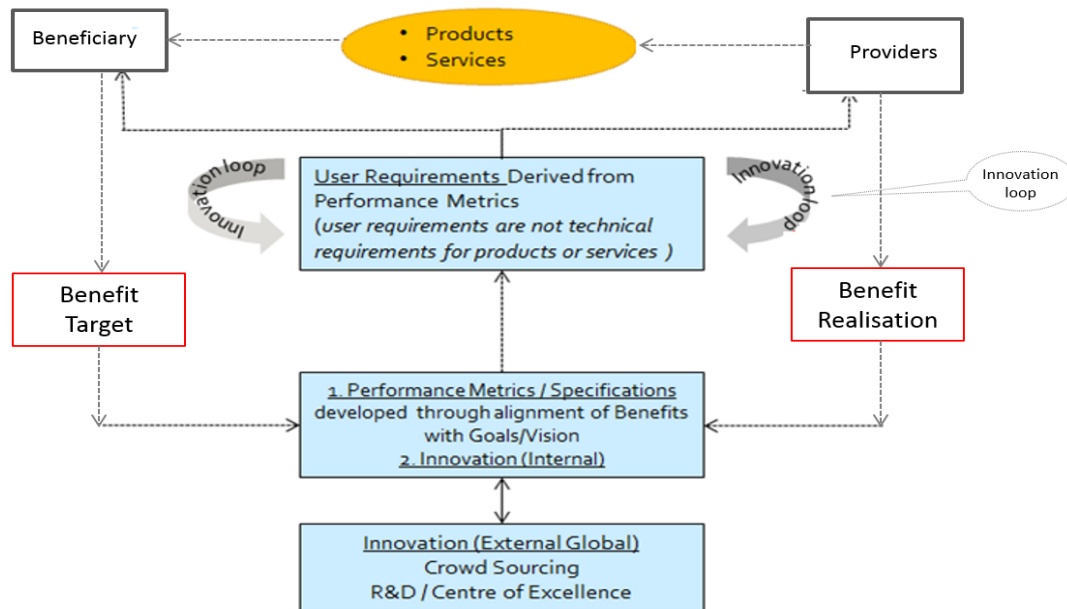


Fig. 1. Innovation-led benefits framework for ICT procurement.

The proposed framework highlights the joint effort in Benefit realisation through co-innovation and collaboration on IT governance.

VI. CONCLUSION

In this paper, an ICT alignment conceptual framework is presented which can establish an alignment in terms of procuring and managing ICT projects. Therefore, maximum organisational benefits can be achieved from the IT projects. In the future, different aspects of the conceptual framework will be represented to measure the performance of benefit realisation approach.

REFERENCES

- [1] P. Dintrans, A. Anand, M. Ponnuveetil, and J. Vijayakrishnan, "Maximizing business value through effective IT governance," *Cognizant, Cognizant 20-20 Insights*, 2013.
- [2] J. Peppard, R. Lambert, and C. Edwards, "Whose job is it anyway?: organisational information competencies for value creation," *Information Systems Journal*, vol. 10, pp. 291-322, 2000.
- [3] S. P-J. Wu, D. W. Straub, and T-P. Liang, "How information technology governance mechanisms and strategic alignment influence organizational performance: Insights from a matched survey of business and IT managers," *MIS Quarterly*, vol. 39, pp. 497-518, 2015.
- [4] D. H. Peever, R. Hill, P. Leahy, J. McDowell, and L. Tanner, "First principles review of defence - Creating one defence," In: *Defence*, D. O. Ed., Canberra, Australia: Commonwealth of Australia, 2015.
- [5] T. Bovaird, A. G. Bovaird, and E. Löffler, *Public Management and Governance*, London: Routledge, 2016.
- [6] B. Flyvbjerg and A. Budzier, "Why your IT project may be riskier than you think," *Harvard Business School Publication Corp.*, 2011.
- [7] P. Weill and J. W. Ross, *It Governance: How Top Performers Manage It Decision Rights For Superior Results*, Harvard Business Press, 2004.
- [8] J. Ward, P. Taylor, and P. Bond, "Evaluation and realisation of IS/IT benefits: An empirical study of current practice," *European Journal of Information Systems*, vol. 4, pp. 214-225, 1996.
- [9] D. Remenyi and M. Sherwood-Smith, "Business benefits from information systems through an active benefits realisation programme," *International Journal of Project Management*, vol. 16, pp. 81-98, 1998.
- [10] O. E. Williamson, "Transaction-cost economics: The governance of contractual relations," *Journal of Law and Economics*, pp. 233-261, 1979.
- [11] O. E. Williamson, "Outsourcing: Transaction cost economics and supply chain management," *Journal of Supply Chain Management*, vol. 44, pp. 5-16, 2008.
- [12] J. Riposo, G. Weichenberg, C. K. Duran, B. Fox, W. Shelton, and A. Thorsen, "Improving air force enterprise resource planning (ERP) -enabled business transformation," In: *Corporation*, R. Ed. DTIC document, 2013.
- [13] B. S. Aronin, J. W. Bailey, J. S. Byun, G. A. Davis, C. L. Wolfe, T. P. Frazier, and P. F. Bronson, "Expeditionary Combat support system (ERP): Root cause analysis of cost and schedule overruns," In: *IDA*, I. F. D. A., Ed. DTIC Document, 2011.



Amit Ghildyal has a bachelor's degree in engineering and an MBA, and is a certified procurement professional (MCIPS – UK). He is currently enrolled as a Ph.D candidate with UNSW Canberra under supervision of professor Elizabeth Chang and his research is on developing a new model for information governance in defence because of the impact of the rapidly changing digital services environment and first principle review on defence supply chain.

Mr. Ghildyal has worked with large global corporations across Asia-Pacific in a variety of operational and corporate roles, and functions including supply chain engineering and management. He has evaluated and developed suppliers using ISO standards and best practice governance frameworks. He also developed performance measures, and set-up supply chain data-analysis and reporting. He led the implementation of one of the world's first web-based collaborative global data-centric supply chain

information systems in the Asia Pacific region; this led to a transformational impact across all the organisations in the value chain - improving supplier response time, productivity, and visibility of key program deliverables along the glide.



Elizabeth Chang is professor of logistics and Canberra fellow at the UNSW Canberra at the Australian Defence Force Academy (ADFA) since 2013. Professor Chang leads the defence logistics research group at UNSW, targeting the key issues in Logistics ICT, big data management, defence logistics and sustainment, predictive analytics, situation awareness, IoT and cyber-physical systems, trust, security, risk and privacy. In the 2012 edition of MIS Quarterly vol. 36 issue. 4 special issues on business research, professor Chang was ranked fifth in the world for researchers in business intelligence.

She has delivered 48 keynote/plenary speeches largely at major IEEE conferences and most recent in the area of semantics, business intelligence, big data management, data quality and the like. Her academic achievement includes 27 competitive research grants including 12 Australian research council (ARC) grants worth over \$15 million. She has supervised/co-supervised 41 Ph.D theses to completion, 21 master theses and 18 post-docs. She has published seven authored books, over 600 international journal papers and conference papers with an H-Index of 40 (Google Scholar) and over 8000 citations.

She is an IEEE fellow and has been chair/co-chair for IEEE IES technical committee on industrial informatics since 2010. She has been chair of the

IFIP international working group 2.1/12.4 since 2012. She is also an associate editor for IEEE transactions on industrial electronics (since 2007); Co-editor in chief for International Journal on Engineering Intelligent Systems. She is a member of Council of Supply Chain Management Professionals, honorary member of the Australian Logistics and Supply Chain Society. She was honoured to be the General Chair and Technical Chair for over 20 International and IEEE Conferences



Sazia Parvin is a data and system security researcher at the School of Business, UNSW, Canberra. Her research interests include network security, trust management, cyber systems, cloud computing, big data analytics, system software and intelligent information systems. Her research is published in various top ranked publications. She has published over 27 research papers in her fields of interest as journals and international conferences. She is an

associate editor for International Journal of Computer System Science and Engineering (IJCSSE) and International Journal of Engineering Intelligent Systems (IJEIS). She has more than 7 years of experience in information system's design and development in various business environments. She holds 7 years of extensive teaching experience in software and computer engineering discipline. She has achieved several prestigious research grants from Australia and South Korea. She is also the recipient of the 'Gold Medal' bachelor of computer science and engineering award from Jahangirnagar University in 2004 for her outstanding performance (First Class First Position) in that academic year.