

# Realising Value Through IT Governance: Issues and Solutions

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**Abstract.** Defence has embarked on a journey of digital transformation, as documented in its Enterprise Information Management (EIM) 2015-2025 Strategy. The proposed Digital Transformation is to be built on the foundation of Information Technology (IT) governance. The EIM strategy is driven by benefits, led by prioritised business needs, and incorporates a framework for Benefits Outcomes & Capabilities. We believe, the key benefit at the organizational level, is realization of ONE Defence, which includes the target to retire a majority of current 2500 silo-ed systems, such as 300 financial applications, by 2025. The key benefit at operational level is to allow Defence officers including military and civil military personal to access a single source of truth for seamless information flow and enterprise-wide information management.

From our study of the literature, it is evident that there is a lack of practical approaches to realising benefits. Therefore, in this research, we have proposed a practical framework for enabling benefits realization. We have used the concept of incremental enlargement principle within an iterative innovation-loop to achieve benefits realization. We demonstrate how the proposed conceptual benefits-realization and IT governance model will provide insight on value realization by aligning enterprise goals and enterprise end-user need. This alignment is achieved through collaboration between key internal and external stakeholders within the afore stated iterative innovation-loop.

**Key words:** benefits realization, IT governance, innovation loop

## 1. Introduction

Defence is currently undergoing massive changes driven by the First Principles Review (FPR) [1]. Aligned with the FPR recommendations, the Defence organisation has initiated the digital transformation process. For this transformation to succeed, Defence would need to adopt new practices and approaches to manage the volume and complexity of data and information. The strategy for the above is outlined in the Defence document - Defence Enterprise Information Management (EIM) Strategy 2015-2025 [2].

This EIM strategy is to support realization of ONE Defence vision [1] and includes the target to retire by 2025 a large number of current 2500 systems such as 300 financial applications and to allow Defense access a single source of truth for seamless information flows and enterprise-wide information management.

The benefits-driven strategy as stated by EIM includes five benefits [[2], p12], namely:

- 1) Effectiveness
- 2) Responsiveness
- 3) Efficiency
- 4) Compliance
- 5) Interoperability

Initiatives for addressing challenges associated with benefits realization are [[2], p8-10]:

- 1) Establish a trusted single source
- 2) Deliver common battlespace awareness
- 3) Measure performance by quality information
- 4) Educate, train and resource staff
- 5) Improve performance of key Information Management (IM) solutions such as records management, search and collaboration
- 6) Standardise business and information processes
- 7) Establish clear accountabilities
- 8) Manage information as an Asset

EIM initiatives to deliver are [[2], p4]:

- a. Business-led
- b. Trusted & protected
- c. Standardized, integrated and interoperable,
- d. Intelligent, agile and innovative
- e. Strategically manage information

However, from a practical point of view, Defence is challenged on how to implement above to achieve the One Defence vision, which is to retire by 2025 a large number of current 2500 systems and to allow Defense access single source of truth.

## **2. The Challenges of the Benefit Realization Model in Literature**

The benefits approach of the EIM strategy appears to be sound at the policy level; however, there is a need to build an implementation and evaluation framework to help ensure realisation of benefits and that of the vision. This is critical because benefits are generally realized after the successful implementation of the IT project. The benefits range from “problem-based solutions” which help achieve business objectives and prevent performance deterioration, to “innovation-based solutions” enabling a competitive advantage [3] [4], which is very desirable in the Defence environment. According to Mohan, Ahlemann [4], understanding how to realise value through IT projects remains one of the challenging issues facing the information systems field. Ensuring benefits-driven strategy for Defence EIM is a sound approach as IT is viewed as failing to deliver “value for money”. [3].

The key issue observed in the literature is that there is a lack of a practical framework which helps define the commonly understood and agreed benefits, and provides an implementation road map to help realise the benefits.

Wu, Straub [5] have researched that well-designed IT governance mechanisms enable IS strategic alignment, which itself increases organizational performance, especially operational excellence and customer attentiveness.

According to Chen, Chiang [6], there is a shortage of professionals that have deep knowledge for managing the volume, velocity and variety of data. In the academic and commercial world, it is well understood that, in the near future, 5G networks are going to add to the complexity of data in terms of value, volume, velocity, variety, veracity and variability [7] leading to disruptive innovations that in turn will lead to many more unknown disruptors. [8]

Porter and Heppelmann [9] provide insight into the new “technology stack” in which smart connected products require companies to build and support an entirely new technology infrastructure.

It is worth noting that several US Defence ERP projects have been considered as “failures” [10], [11]. As per Standish-Group [12], 63% of IT projects failed.

Putting all the afore stated together, we can summarise that benefits-driven IT strategy would require fast decision-making on investments on technological innovations that, whilst being disruptive, would need to be accepted into the organisation’s technology stack to generate benefits in the future. Realising benefits would need an implementation plan that would rapidly adapt to further technology innovations. All of this under an environment where there is a shortage of professionals having deep knowledge and where the likelihood of IT project failure rate is high.

What will be the governance arrangement in this rapidly evolving technology innovations environment? How will we know what benefits are these rapidly evolving technologies going to provide in terms of “problem-based solutions” and “innovation-based solutions”? How do we access know-how when there is a lack of professionals with deep knowledge? How can we take investment decisions fast enough to accept the technology into the technology stack? How do we realise benefits from these technology investments? The key question, in other words, is - what is the benefits realisation and IT governance framework that will help ensure realisation of benefits to support the EIM strategy?

In this paper, we present a conceptual framework for benefits realization through IT governance that will support Defence EIM 2025 strategy. This paper introduces the recently published concept of incremental enlargement principle [13] into the benefits realization framework within an iterative innovation-loop [14]. The research is aimed at supporting One Defence implementation and benefits realisation mechanism for EIM strategy.

### **3. Existing work related to Benefit Approach**

There is a lack of literature on benefit realization models for the public IT sector. There is extensive research in the commercial sector, which has shown the importance of appropriate IT Governance mechanisms on firm performance. Limited studies suggest that some, but not all, of the same strategies can be applied to the not-for-profit sector to achieve enhanced organisational performance. However, there is scarce research about such mechanisms in the Defence context. IT governance is a critical part of the conceptual benefits realization framework that is to be proposed. In the following sub-section, literature on IT governance is reviewed.

Weill and Ross [15]’s study of almost 300 enterprises across the world suggests that IT governance is a mystery to key decision makers at most companies; that the single best indicator of effectiveness of IT Governance is senior management awareness; and that companies that effectively govern information technology garner profits that are 20% higher than those of other companies pursuing similar strategies. These companies also achieve higher returns on equity (ROE), return on investment (ROI), percent profit margin, asset utilisation (ROA), and growth in market capitalisation.

### **a. Benefit through Strategic Alignment between Business and IT**

IT governance enables both business and IT personnel to execute their responsibilities in support of business/IT alignment and the creation of business value from IT-enabled business investments. [16]. Henderson and Venkatraman, in their ground-breaking work on business/IT Strategic Alignment, [17],[18], proposed a Strategic Alignment Model for conceptualising and directing the emerging area of strategic management of information technology. The model is defined in terms of four fundamental domains of strategic choice – business strategy, information technology strategy, organisational infrastructure and processes, information technology infrastructure and processes – each with its own underlying dimensions.

Gerow, Grover [19] examined IT-Business strategic alignment over the years through a meta-analysis of 30 years of alignment research. They found that alignment should lead to higher levels of performance.

### **b. Benefit of IT Governance for Organisational performance**

The literature reviewed so far states that IT governance affects Business-IT alignment and these two affect business value or organisational performance. Research published by Wu et al [20] proposes a nomological model showing how organisational value is created through IT governance mechanisms. They have created this model by consolidating the strategic alignment and IT governance models. In order to empirically validate the research model, a field study was conducted. Figure 1 depicts the structural model used to explain the causal affect that the positive impact of well-designed IT governance mechanisms enable IS strategic alignment, which in turn increases organizational performance, especially operational excellence and customer attentiveness. According to Wu et al, these findings have substantive implications for organisations implementing IT governance practices in as much as IT governance needs to be focused and leveraged in order to create superior strategic alignment. [20]

Whilst all these aspects of organisational performance can be measured in commercial organisations and focusing on these will lead to more effective and efficient organisations, it is not clear how these aspects of organisational performance may be measured or applied in the Defence context. Note that the FPR states: "...for Defence the objective is to function as a truly integrated agency that consistently produces the best public value, and is able to meet the current and future demands on it". The FPR does not provide details of these objectives and measures for "public value" and is vague on current and future demands.

### **c. Organisational Performance versus Benefits Realization**

It is important to understand that information systems investment does not provide any sustained advantage by itself nor does it have any inherent value. Value is created by the organisation's ability to convert and use the IT resource. Researchers call this "benefits realisation". Firms develop information systems to realise benefits after the implementation of the system. [4]. The realisation of benefits lead to "interventions" i.e., changes to the way the business is conducted and how people work. There are two types of interventions – problem-based and innovation-based. In problem-based interventions, improvement targets such as ROI form the basis of business case. ERP is a problem-based intervention. In the case

of innovation-based interventions, it is difficult to specify the end targets because there is uncertainty about its implementation success. This uncertainty implies that objectives and scope may well change during implementation, as the organisation learns more about its environment and the evolving technology. [3]

Understanding how to realise value through IT projects remains one of the challenging issues facing the information systems field.[4]. Most organisations focus on implementing the technology rather than on realising the expected benefits.

In fact, many CIOs have reported that their IT investments have failed to generate a genuinely good return. Generally, success of an IT project is measured by whether or not it has been delivered on time, within specifications and within budget. Many benefits in the business case are overstated in order to get the project approved, leading to the benefits not being completely realised [3]. It is worth noting that a large number of US Defence ERP projects have had implementation “failures” [10], [11]. As per Standish-Group [12], 63% of IT projects failed or were challenged and only 37% of projects were successful. 20% of features are used often and 50% are hardly ever used or never used. The most interesting part is that the average cost overrun is more than 178 % for large companies and even larger for medium and smaller companies. How can organisations plan for benefits and then realise these benefits for any given IT investment?

#### d. Existing Benefits Realization Models

Ward, Taylor [21] have proposed best-practice guidelines on benefits management. Their validated model is shown in figure 2.

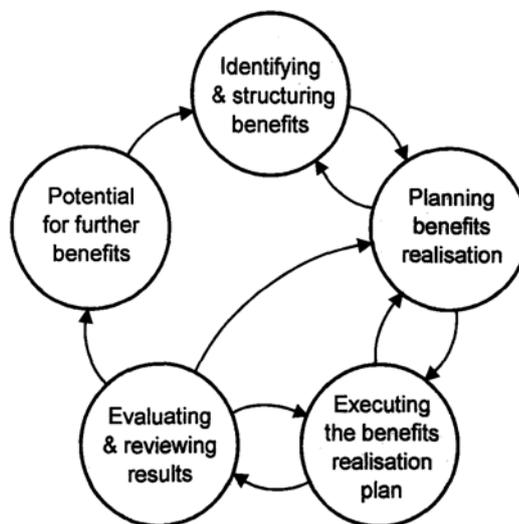


Figure 2. A process model of benefits management

*Reproduced from Eu. J.Inf.Systs (1996) 4, 214-22; Authors: Ward, Taylor and Bo; Evaluation and realisation of IS/IT Benefits: an empirical study of current practice*

Remenyi and Sherwood-Smith [22] describe active benefit realisation (ABR) process for managing information systems’ development through a continuous evaluation approach; Figure 3. The 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 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. Information systems development follows an iterative formative evaluation process.

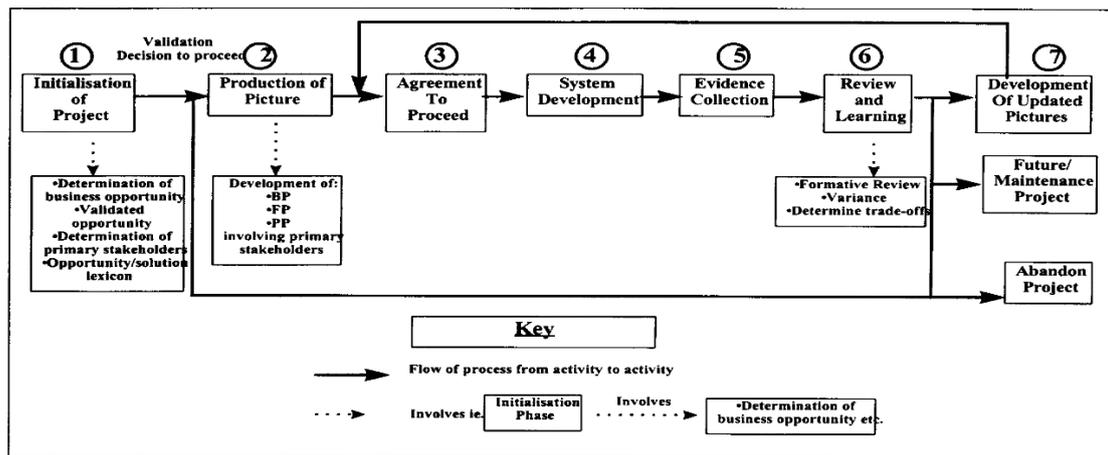


Figure 3. The process for active benefit realisation (ABR)

Reproduced from *Int. Jnl. Of Project Management*, Vol. 16, No.2, pp.81-98, 1998; Authors: Remenyi and Sherwood-Smith; *Business benefits from information systems through an active benefits realisation programme*

The Victorian Department of Treasury and Finance [23], Australia, has developed an Investment Management Standard (IMS) [23]. The IMS provides an Investment Logic Map, Figure 4, wherein understanding benefit leads to strategic response and solution definition to the problem, the reason for the investment, in the first place.

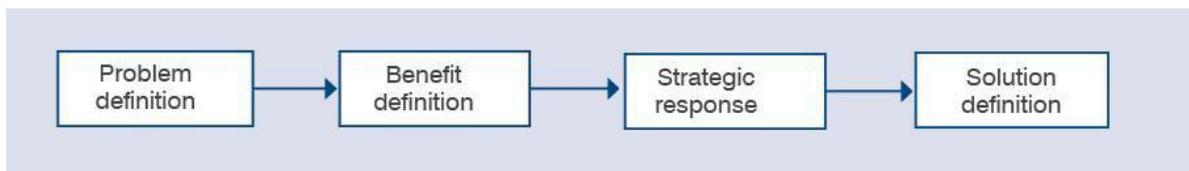


Figure 4. The “benefits” approach to shaping a new investment

Reproduced from “*Investment Management Standard A guide for Victorian government departments and agencies*”

This is a linear model and does not have an iterative approach. In other words, benefits need to be defined before investment review.

Peppard, Ward [3] propose a benefits management approach and state that most organisations focus on implementing the technology rather than realising the expected business benefits and consequently, despite a project’s success, the benefits are not realised. Their five principles for realising benefits through IT are – that IT has no inherent value, that benefits arise when IT enables people to do things differently, that only business managers and users can release business benefits, that all IT projects have outcomes but not all

outcomes are benefits, and that benefits must be actively managed to be obtained. Problem-based and innovation-based “interventions” are the two distinct types of IT-led changes that need to be understood for benefits realisation. They have proposed a list of seven questions that will help assist in developing the benefits realisation plan. This plan can be used to develop the business case. Their Benefits Dependency Network (BDN) provides the framework for explicitly linking the overall investment objectives and required benefits (the end) with the business changes (the ways) necessary to deliver those benefits and the essential IT capabilities (the means) that enable these changes.

Kunal, Frederik [24], have investigated the relationship between benefits management constructs and practices, and benefits realisation success. They have developed a model – the estimated benefits realisation model. Their findings indicate that quality and frequency of project related communication between the business and IT departments is the most important determinant of successfully realising benefits from projects. Their interesting finding is that the greatest potential to increase the probability of successful benefits realisation lies in the improvement of ability to continuously review the status of benefits realisation in projects. The assumption here is that the constituent practices are underpinned by skills, knowledge and experience of organisational employees.

From the above literature review, six research gaps were identified. These gaps are addressed in the next section.

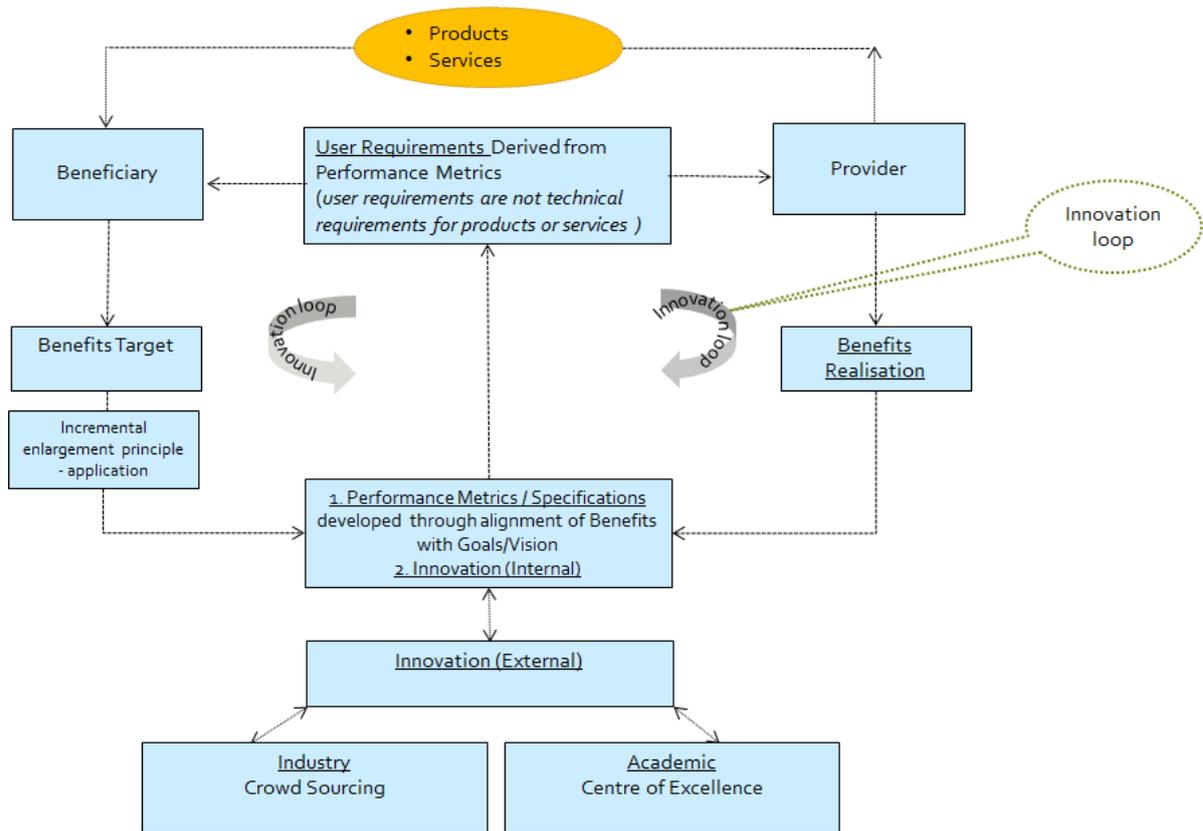
#### 4. An innovation-led Benefits Framework for Defence and Public Sector

In this section, a conceptual model (framework) for realizing benefits is proposed which is shown in Figure 5. It addresses the six identified research gaps.

The proposed benefits framework includes three stakeholders – the beneficiary or the user, otherwise known as the procuring organisation. The user generally has a good idea of what he or she wants (example, a faster response time of the system) and so states the high level benefits targets. The second party is the provider of the goods and services. The provider has a good understanding of realizing benefits through experience in implementing similar IT systems for other clients. The first party sets up a contract with the second party for the provision of IT goods and services. The third party is external to the contract between the first two parties. The third party comes from either the academic world or industry crowd sourcing. The third party has specific knowledge-base and can provide best-practice advice based on research or industry expertise. Table 1 shows the domain expertise of each stakeholder. By collaborating, they can share their expertise.

*Table 1: Stakeholders and their Domain Expertise*

<i>User</i>	<i>Provider</i>	<i>External</i>
<i>Realizing organisational targets</i>	<i>Realizing benefits for clients</i>	<i>Possesses Expertise / Knowledge</i>



**Figure 5.** Conceptual Framework for an innovation-led approach to benefits-realisation and IT governance

Whilst the procuring organisation (the “Beneficiary” as shown in Figure 5 ) has a limited idea of benefits, perhaps gained from previous projects, the expertise on identifying, proposing and supporting the realisation of the benefits rests with the IT provider (the “Provider” ). Therefore, the important consideration here is to align the expertise (that is, understanding of the organisational goals, problems) of the IT procuring organisation with the expertise (that is, understanding benefits and its realisation) of the IT provider organisation. When this alignment occurs, it realises highly desirable multiple aims through ongoing innovative solutions and through the development of performance metrics, specifications, and user requirements - iteratively. The alignment occurs in a closed continuous “innovation” loop until the project reaches the “disposal” stage.

The incremental enlargement principle is used to take the initial high level benefits through the stratification and target reachability process to a stage where it is realistic and achievable. The process is explained below.

In computational systems, we define the “benefit” as the target outcome, “benefit realisation” as the target. We define “target” as “a set of targets”, and we define “target reachability” as moving or transitioning from “current state pressure” to a target state “the Future State” in minimum steps [modal logic].

Refer Figure 6. “Strata” S is defined around the “Target set” T. A Strata may be a special group, a coalition, a layer perceptron, or a sub-system with a stratified structure that is underpinned by temporary joint and agreed goals or target set.

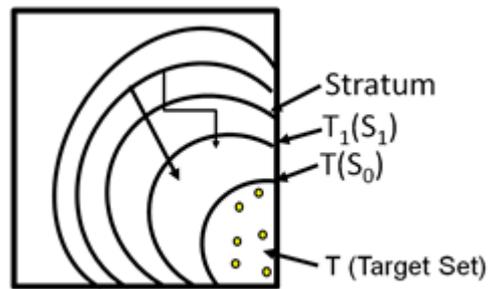


Fig. 6. Incremental Enlargement Principal [13]

If the target is not reachable, we incrementally enlarge the Target or we incrementally enlarge the Stratum (for instance) through the use of granulation and/or quantization of the “Benefit” concept to reach to a finite amount. A simulation model is to be produced as part of this research.

The framework provides the following benefits:

**Access to best practices and innovation through external agencies.** The internal “innovation” loops are coupled to external “innovation” programs of research centres such as academic centres of excellence, industry R&D, and crowd sourcing. The external research centres trigger further innovative solutions, as an example, using forecasting techniques such as “reference class forecasting”.

**Collaboration between three groups.** In this framework, we bring about a partnership of three groups – the organisation that desires IT-led change, IT industry (includes the provider), and IT academic research organisation. The contract in Figure 5 can be viewed as a flexible framework and not a rigid contract that serves as a legal weapon or protective device. The flexible framework allows collaboration and sharing of information leading to reduction in governance arrangements.

**Best practice contracting arrangement.** According to Williamson [25], trade exchanges will benefit from being of an ongoing kind, and in as much as all complex contracts are incomplete, additional gains can be realized 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". Note that in this framework, the contract is a flexible arrangement and not a rigid contract.

## 5. Validation of the Proposed Benefit Model

A mathematical construct for validation of the conceptual framework is being developed. Initial trial-runs show that there is a gap in measured performance for the same service between the users and the providers. From the user’s perspective, the requested service can provide 98% performance, whereas from provider’s perspective, the same service can provide 86% performance. Here the benefits reported by the user is higher. This is incorrect however similar situations have also been reported in the literature. Importantly, this framework has a resolution process, given below.

The gap in performance measurement indicates that the prioritization of requirements from user side is different from that of the provider side. This can even lead to strong disagreements between user and provider. To resolve their differences, the framework proposes

finding solutions externally, for example, through crowdsourcing or academia. Once this process starts, all the three stakeholders would need to come to a mutual agreement. After this agreement, they would assign “weightage” against each benefit and requirement. This could take place in a iterative loop under a flexible and open arrangement, reviewing each benefit and requirement until its final prioritization is determined on agreed terms.

## **6. Conclusions - limitations and future research**

This research reviewed existing literature on issues and challenges with benefits approach through IT governance, as well as issues and challenges with implementing benefits model for benefits realization. This paper presents the literature from issues to solutions with regard to benefits realization. Our proposal shows that the power of three stakeholders - user, provider and external experts - can be leveraged for quick and innovative solutions. It has also been explained how the crowdsourcing techniques can be applied in this context to moderate the effect of disagreement between the stakeholders. The validation model will need to address the interdependency of the benefits – some technologies might trigger several other benefits that were previously not understood. Yet other new innovations might have an adverse impact on benefits that were generated by extant technologies.

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