
Challenges in How to Effectively Evaluate the Business Benefits of Information Systems Investments

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Abstract

To optimise success in Business/IS alignment efforts requires further understanding of the challenges that inhibit evaluation know-'how'. This paper reviews literature to promote a shared understanding of the key challenges with 'how-to' of evaluation to demonstrate Business Benefits of IS Investments. As the review of literature followed an inductive approach, the challenges identified are synthesized in a conceptual matrix, along three key dimensions that emerged. These comprised the need to categorise Information Systems Investment types to realise optimal value in Information Systems Usage, the need to categorise and disaggregate benefits in order to attribute their individual values to Information Systems and lastly, the need to enable an appropriate mix of evaluation approaches based on the array of benefits and the contexts within which they are being evaluated. Ultimately the type of Information Systems Investment, how it is used, and the benefits it is anticipated to generate, will determine the evaluation approach. The review of literature that follows forms the basis of a research study in progress.

Keywords: Information Systems/Business Alignment, Information Systems, Investments, Business Value, Business Benefits, Evaluation, Challenges.

1. Working Definitions:

- Business relates to a person, partnership, or a company engaged in the manufacture, and / or trade of goods and / or services for the purpose of profit making (adapted from <http://dictionary.reference.com/>),
- Information Systems in turn, are “*the means by which businesses utilising integrated human and technological resources and capabilities, gather, process, store, use and disseminate information*” (adapted from Ward and Daniel, 2012, p.17; Ravichandran and Lertwongsatien, 2005).
- Benefits: something that is advantageous or good; an advantage (http://dictionary.reference.com); the management thereof ensures in different contexts, their attributability (for instance to IS Investments, or their realisation from the same).
- Business/IS alignment as observed by Strassmann (1998) in his paper Alignment is the Delivery of Required Results, “*must relate to benefits*”. Thus Business / IS Alignment, the Business Objectives that drives that alignment, the Investments required to be made to enable their Benefits and subsequent Organisational Performance, should not be considered mutually exclusive.
- E(valuation) is a systematic determination of a subject's merit, worth and significance, using criteria governed by a set of standards. It can assist an organization, program, project or any other intervention or initiative to assess any aim, realisable concept/proposal, or any alternative, to help in decision-making; or to ascertain the degree of achievement or value in regard to the aim and objectives and results of any such action that has been completed. The primary purpose of evaluation, in addition to gaining insight into prior or existing initiatives, is to enable reflection and assist in the identification of future change. (<http://en.wikipedia.org/wiki/Evaluation>)
- Investment: investment is putting money into an asset with the expectation of capital appreciation, dividends, and/or interest earnings. In the context of this presentation Investment would be in lieu of benefits accruing to organisation (adapted <http://en.wikipedia.org/wiki/Investment>)

2. Introduction

Many Information Systems (IS) Investment expenditure trends between 2011 and 2013 indicate on average, that IS Investments have been the fastest growing investment category, accounting for approximately 5% of increasingly squeezed organisational budgets (Li, Huang, Luftman and Sha, 2010; Luftman et al., 2013). Yet many organisations' ability to effectively evaluate IS Investment impact on the realisation of Business Benefits, and ultimately organisational performance, remains the holy-grail, mired in controversy (Bush, Lederer, Li, Palmisano and Rao, 2009; Ward & Daniel, 2012). Further proof of the challenge organisations experience with conducting effective evaluations is demonstrated in the results of two studies conducted between 2006 and 2008 by Ward and Daniel (2012). The study found that over 200 respondents from 30 diverse geographies overwhelmingly concurred that evaluation of business benefits, remained the most contentious and problematic of the benefits management activities to carry-out.

By definition, Business/IS alignment relates to delivery of business benefits from IS Investments (Strassman, 1998). And since only what is evaluated can ever be realised (Crossman, 2010), the failure to effectively evaluate the Business Benefits of IS Investments

in the face of ever increasing IS Budgets suggests a (mis)alignment of objectives and outcomes between Business and IS. The extent of the issue of Business/IS alignment is such that almost three decades after the issue came to the fore of top IS management issues, it still maintains its top three position in Chief Executive concerns in surveys of the past 3 years (Luftman and Zadeh, 2011; Luftman, Zadeh, Derksen, Santana, Rigoni and Huang, 2012; 2013).

McDowell and Simon (2004, p.67) maintain *that “the real failure of judging IS (contribution to the realisation of Business Benefits) isn’t what to evaluate, but how”*. Other IS researchers conversely argue that the ‘when’ of evaluation, both in timing and context, is also a key contributor to the challenges organisations experience with evaluation of Business Benefits of IS Investments (Cronk and Fitzgerald, 1999; Larsen and Myers, 1999).

What researchers concur on however, is that there is a dearth of appropriately dynamic and holistic evaluation methodologies, which hinders the practice of evaluation (Crossland, 2010; Gomez and Pather, 2012; Kyobe, 2008; Lin and Pervan in Van Grembergen, 2001). Ashurst et al., (2008, p.353 cited in Crossland, 2010) concludes that there is a need for *“novel contributions into how an explicit focus on benefits realisation might be incorporated into actual routines of systems development and implementations”*.

In an attempt to overcome inhibitors to the practice of evaluation, this study examines the ‘how-to’ challenges that organisations encounter in evaluating business benefits from IS investments. The research methodology adopted for this study is highlighted in Section 3. Thereafter, the review of literature based on a thematic analysis into the causality of the phenomenon under study is discussed. The discussion encompasses the ‘how-to’ challenges that organisations encounter in the practice of evaluating business benefits of IS investments. The gap analysis is presented, prior to concluding.

3. Research Methodology

3.1. Research Method

The literature review was conducted as part of a research study in progress. The literature review followed an inductive approach, allowing themes to emerge from theoretical bodies of work consulted. These themes have been synthesized into a conceptual matrix to guide the structure of the review, Figure 1. Table 1 further synthesizes theoretical arguments relating to the key challenge of this study; determining the root cause for marked lack of evaluation of business benefits from IS investments, in practice.

3.2. Data Collection

Secondary data was gathered from the accessible theoretical bodies of work of academicians and practitioners. Data was in the form of published articles, books, technical resources, as well as a minimal amount of online resources. The online resources were used primarily for definitional purposes, and were validated by the other data collected. The data was identified on the <http://www.lib.uct.ac.za.ezproxy.uct.ac.za/> search engine, using keyword search (Information Systems/Business Alignment, Information Systems, Investments, Business Value, Business Benefits, Evaluation, Challenges). The search criteria aligned with the broader area of research of business value of IS investments. From this broad area the authors reviewed the resources, keeping only to a sub-set of business benefits, business benefits evaluation, and lastly, only those resources relating to business benefits deriving from IS and their investments. In the review and discard process, additional supporting data such as that relating to the inter-dependencies between Business and IS, specifically data relating to Business/IS alignment was reviewed.

3.3. Data Analysis

Following an inductive approach to allow key themes and thus findings to emerge from collected data (Mukwasi and Seymour, 2012); an analysis of all collected material was initiated following the process outlined below:

3.3.1 Data Rationalisation

This involved a high-level review of collected data to exclude to resources were not adequately aligned with the keyword criteria (Information Systems/Business Alignment, Information Systems, Investments, Business Value, Business Benefits, Evaluation, Challenges), or those that could not be validated (Mukwasi and Seymour, 2012; Trochim, 2006; Yin, 2003).

3.3.2 In-depth review of Data

In-line with the objective of this study, to gain a deeper understanding and meaning of the phenomenon to enable us to start identifying the key themes as they emerged, an in-depth review of the remaining materials was conducted. A few articles were not carried forward beyond this point in the review. The remaining ones

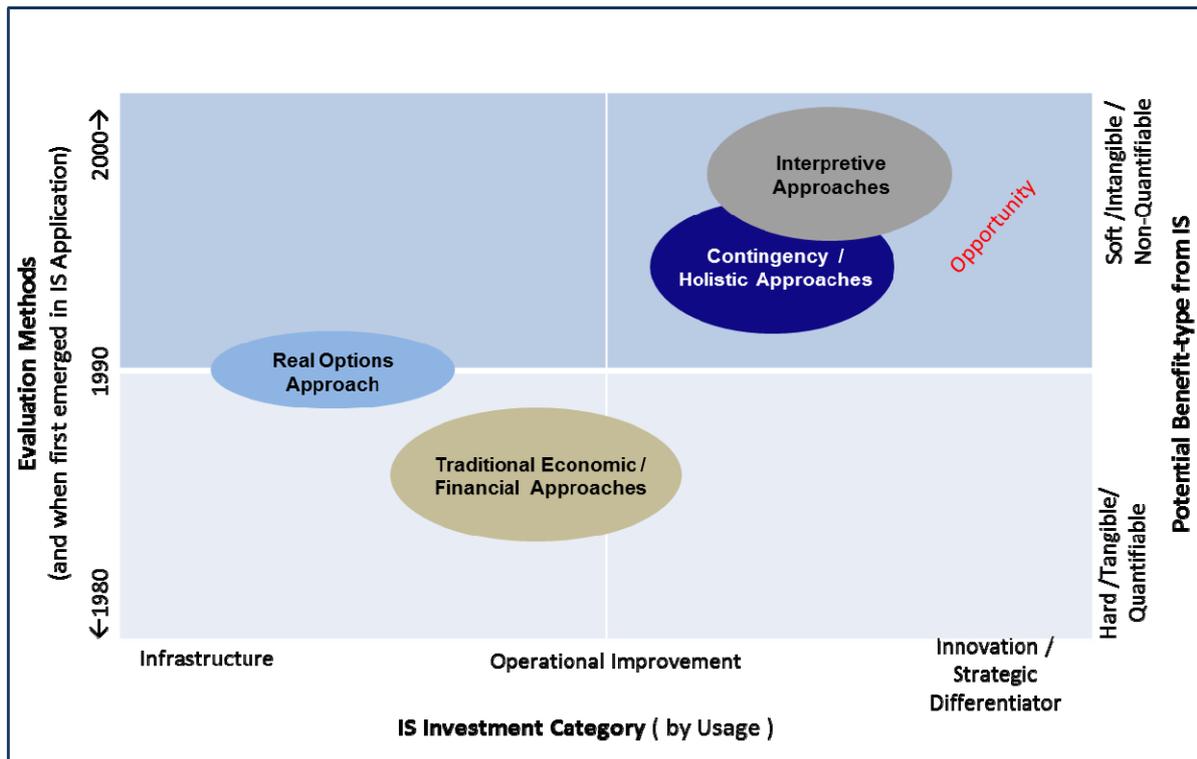
3.3.3 Thematic Review of Data

This part of the analysis was conducted using thematic analysis to uncover the underlying themes that inhibit the operationalization of the Evaluation of Business Benefits of IS Investments (Crossland, 2010; Larsen and Myers, 1999; Mukwasi and Seymour, 2012). The themes that were uncovered using the balance of the data collected were plotted on a conceptual matrix (Figure 1: Conceptual Benefits Evaluation Theory Framework - adapted from Literature Review).

4. Challenges in Evaluating of Benefits of IS Investments

There is consensus amongst IS researchers that the issue of evaluation is complex and multi-dimensional. Figure 1 below, adapted from findings from the review of literature, demonstrates these evaluation-inhibiting dimensions along the three axis; the uses of IS investments, the categorisation of business benefits deriving from them, and their evaluation approaches. These dimensions are reviewed in turn in the sections that follow (Chang and de Young, 1995; Cline and Guynes, 2001; Crossland, 2010; Giaglis et al., 1999; Gomez and Pather, 2012; Kyobe, 2008; Larsen and Myers, 1999; McDowell and Simon, 2004; Singh and Harmon, 2003; Van Grembergen, 2001; Ward and Daniel, 2012).

Figure 1: Conceptual Benefits Evaluation Theory (adapted from Literature Review)



4.1. Evaluating by IS Investment Categories (IS by Usage)

IS Investments involve the expenditure of an organisation’s capital resources towards its IS, with the intention of meeting specific objectives which are validated by the business benefits that accrue to it over time (Adapted from Lin and Pervan in Van Grembergen, 2001). Notable here is the need to categorise investments in order to realise the specified benefits, or to differentiate benefits accruing from disparate investments (Giaglis et al., 1999).

Ravichandran and Lertwongsatien, posit that *“Investing in IT is not a necessary and sufficient condition for improving (organisational) performance, since IT investments might be wasted”* (2005, p. 240). Hence the need to disaggregate IS Investment contribution to the realisation of Business Objectives, in order to understand its benefits more fully (Bush et al., 2009; Ravichandran and Lertwongsatien, 2005; Sue and Perez, 2006).

The causal relationship between the developments in IS usage and increased complexity of its evaluation is clearly demonstrated by Zubof (1988) cited in Gomez and Pather (2012), when he differentiated three distinct phases of IT usage within organisations as they moved up the maturity continuum (Kyobe, 2008). The three phases were coined the Automate, Informate and Transformate phases:

- Automation dealt with and evaluated quantifiable (hard/tangible) benefits of IS, such as cycle times and accuracy of technology outputs.
- The Informate age, on the other hand focused on the evaluation and management of IT projects and subsequent productivity increases including cost savings and quality amongst other measures, whereas

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- Transformation remains the evaluation of the impact of a broader IS, rather than IT, on varied and dynamic organisational outcomes, epitomised by intangible and not so easily quantified benefits (Gomez and Pather, 2012).

Investments made in IS, and based on IS usage, contextualise the challenges associated with their evaluation, and therefore the choice of evaluation approach to follow (Kumar, 2004). Broadly, IS Investments can be categorised into three distinct groupings; Infrastructure, Operational and Strategic Investments. These three categories are outlined in turn, below. Each one of these categories should be a function of organisational strategic, operational and tactical objectives (Bush et al., 2009).

4.1.1 *Infrastructural Investments*

IT infrastructure enables organisations to 'be-in-business' by providing a platform upon which an organisation can build, deploy and scale-up their IS capability. Investments in Infrastructure according to Kumar (2004, p.12) "*include data storage and retrieval technologies, system integration middleware, connectivity security technologies, infrastructure architects, designers and support staff enabling, processes for standardisation and change management*".

Research shows mixed perceptions when it comes to investing in infrastructure, primarily as this class of investment has not traditionally been considered a direct contributor to the creation of organisational outputs. Nevertheless, infrastructure investments have in recent years become a top managerial concern, prompting more interest in proving their value in a myriad of ways (Smith, McKeen, and Singh, 2007; Ward and Daniel, 2012).

In particular, options evaluation theory was to a large extent developed to counter the previously held perception that indirect benefits, such as from infrastructure investments, could not be easily attributed to business benefits of IS investments, and could consequently not be measured (Bardhan, Bagchi, and Sougstad, 2004; Kumar, 2004; McDowell and William, 2004). However, to enable their evaluation required their disaggregation, using the incremental approach to benefits management discussed in Section 4.2 of this paper (Giaglis et al., 1999).

4.1.2 *Operational Investments*

Ward and Daniel (2012, p.51) refer to this investment group as that which "*prevents disadvantage, rather than provides advantage*". The ability to 'stay-in-business' is what is offered by this class of investment, driving efficiencies in operations as it does. Included in this class of investment, are the organisation's transactional systems which support their daily operations. So while operational investments are critical to the continued operations of an organisation, their business benefit will not usually derive only from regular technology investments, but in combination with continuous improvement initiatives, aimed at enhancing people, process as well as existing / updated (continually maintained and upgraded) technology (Lin and Pervan in Van Grembergen, 2001; Ravichandran and Lertwongsatien, 2005; Ward and Daniel, 2012).

This investment class is generally considered low risk, easily justifiable as it tends to be associated with tangible results that are realisable within relatively short periods of time. Consequently, the rate at which operational investments are approved, both from an authorisation level and the ease with which those decisions are obtained and implemented, can lend bias to this type of investment more than the others (Smith et al., 2007).

The implications of this choice of investment class automatically lends itself to the challenges of its financial evaluation approaches in relation to anticipated benefits (Kyobe, 2008; Van Grembergen, 2001), as can be reflected on in Figure 1 and Table 1. In the quest for making

investments decisions that will deliver optimal business benefits ‘intelligent investments’ (Gomez and Pather, 2012), it is evident that unless IS investors can upfront, mitigate the challenges associated with their investments choices, while developing an organisational memory that enables a longer-term focus on ‘effectiveness’ objectives and benefits realisation, then the perception of ‘waste’ and the paradox bubble may very well persist (Bush et al., 2009; Ravichandran and Lertwongsatien, 2005).

4.1.3 Strategic Investments

This category of investment includes the ‘set-apart’ technologies that often differentiate an organisation from its competitors, albeit for a limited time before other organisations catch-up and reduce, or eliminate the competitive advantage created by these investments. In time then, benefits from investments that start out being strategic may gradually become more operational in nature, at which point they become commoditised and thus no longer offer a unique value proposition for the organisation that introduced the technology innovation (Ward and Daniel, 2012).

As benefits deriving from strategic investments are not only challenging to quantify, but also tend to be sensitive in nature as tools of possible competitive advantage are wont to do, strategic investments are considered the most risky of the three investment categories identified. Furthermore their benefits, compared to operational investment benefits, realise in the longer-run, relatively. As such, they are usually approved and managed at Chief-level Executive (Giaglis et al., 1999; Smith et al., 2007).

Considered ‘effectiveness’ benefits, and despite their positioning in Figure 1, and the evaluation approaches recommended for them in Table 1, these have historically been the least evaluated types of benefits, due to their complexity and lack of practitioner ‘know-how’ involved in their evaluation (Giaglis et al., 1999). Nevertheless, organisations must continuously invest the effort in developing complementary evaluation methodologies and tool-sets, in the contingent and interpretive approaches, best suited to their organisational contexts in order to sustain differentiator benefits associated with this category of investment (Gomez and Pather, 2012; Kyobe, 2008; Larsen and Myers, 1999; Van Grembergen, 2001).

The underlying assumption of this approach to intelligent investing necessitates the differentiation of benefits, and thus their drivers, the identification of the appropriate evaluation approaches for the type of benefits expected and thus the investment type required to elicit them, thus meeting the stated objectives of the organisation (Crossland, 2010; Lin and Pervan in van Grembergen, 2001).

4.2. Business Benefits Realisable from IS Investments (and IS usage)

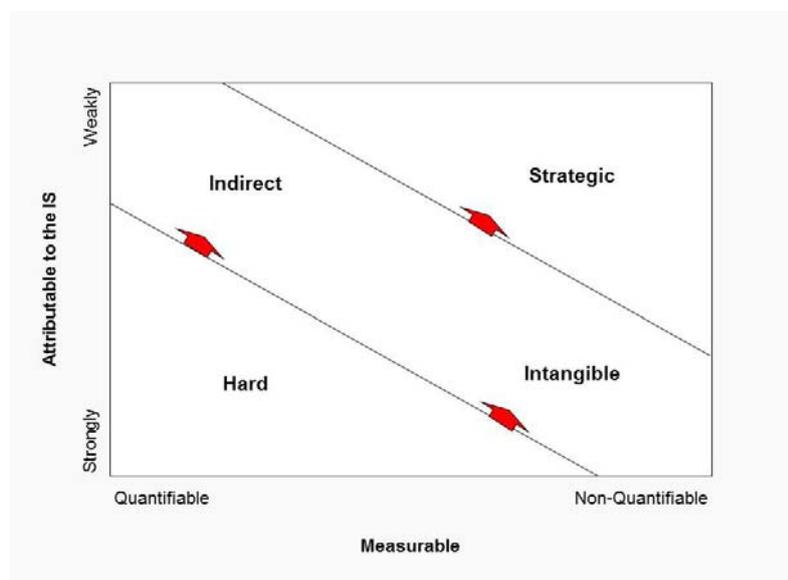
Business Benefits of IS (Investments) relate to the desired outputs sought by business when they engage in strategic, operational and tactical pursuits utilising Information Systems. In doing so however, business uses all its accessible resources, of which IS is but a part, to achieve targeted objectives that enhance efficiencies and effectiveness of the business to position its overall performance favourably with stakeholders, be they customers, shareholders, employees, regulators, or societies within which they operate (adapted from Lin and Pervan in Van Grembergen, 2001; Ravichandran and Lertwongsatien, 2005; Ward and Daniel, 2012).

In line with the definition of Business Benefits above, Markus et al., (cited in Ward and Daniel, 2012) acknowledge that it is more than just the functional benefits delivered by IS that will see organisations meet their set operational and strategic objectives. A combination of factors within the organisation, such as skills and knowledge of employees, business process efficiencies amongst other environmental factors contribute significantly to the achievement of organisational objectives (Thorp, in Van Grembergen, 2001). Thus, the

complexity of attributing benefits realisation to IS Investments poses an ongoing challenge for academicians and practitioners alike (Ravichandran and Lertwongsatien, 2005; Van Grembergen, 2001). As such, there is a great demand for methods and tools to aid in understanding how benefits realised can be attributed to IS Investments, thereby facilitating the understanding and evaluation of IS contribution to organisational success (Giaglis et al., 1999; Ravichandran and Lertwongsatien, 2005).

To counter the effects of benefit aggregation, Giaglis et al., (1999) suggested the adoption of an incremental approach to the understanding of benefits realisation and thus their attributability to IS Investments. The underlying assumption of this approach is the necessity to differentiate benefits, and thus their drivers, measurements and outcomes (Crossland, 2010; Lin and Pervan in van Grembergen, 2001). In keeping with the incremental approach to benefits management, Business Benefits are thus categorisable into 'Hard' (Tangible) and 'Soft' (Indirect, Intangible and Strategic) benefits (Giaglis et al., 1999).

Figure 2: Incremental Approach to Benefits Realisation (Giaglis et al.,1999)



'Hard' benefits are relatively easily measured using quantitative financial and economic evaluation such as Return on Investment and Net Present Value, while 'Soft' benefits present more of a challenge in their qualitative evaluation (Chang and King, 2003; Giaglis et al., 1999). Indirect benefits, while more quantifiable, cannot be directly attributed to IS without further investments, or optimisation of use. Intangible benefits on the other hand can derive from Infrastructure Investments as an example, where benefits of an effective IS Infrastructure might include such constructs as flexibility, upgradability and reliability; not easily measurable dimensions historically (Giaglis et al., 1999; Kumar, 2004). Strategic benefits in turn, are not only difficult to estimate and attribute, they are also high risk in that their realisation is a function of market-related influences, likewise the span of their influence in the organisation and the market at large, when realised, is large and transformative (Giaglis et al., 1999). As the hard (tangible) benefits are easily quantifiable, they are consequently the easiest to disaggregate.

'Soft' (indirect and intangible) benefits are the next increment of benefits to be disaggregated after 'Hard' benefits, as they are relatively less confounding than Strategic benefits. What remains thereafter would be the strategic benefits, which due to their non-quantifiable nature, are the most difficult to disaggregate in order to determine their attributability to IS Investments. The outstanding value attributable to IS investments could in this manner, be assigned to strategic benefits, as demonstrated in Figure 2 (Giaglis et al., 1999).

Given the challenge, and in some instances the cost of evaluating soft benefits, due to the difficulty to attribute them appropriately to IS, some researchers argue that their evaluation should be negligible. Yet others maintain that softer benefits may be worth the investment of evaluating and realising, as they have become a key performance differentiator between IS Investments ex-post (Crossland, 2010). Consequently, as a source of organisational transformation and effectors of change, they ought to and should receive more focus of benefits evaluation efforts; more so than they have done in the past (Crossland, 2010; Giaglis et al., 1999; Lin and Pervan in van Grembergen, 2001).

The evaluation of Business Benefits derived from IS as are discussed in the next section. The evaluation approach is driven by the type of IS usage required from the Investment (Ward and Daniel, 2012; Li et al., 2010).

4.3. Evaluation of Business Benefits of IS Investments

Evaluation Evaluation is a systematic process through which a subject's worth, usefulness and significance is determined, using quantitative and/or qualitative criteria governed by a set of tested standards (Adapted from Alkin in Thomas, 2010; Serafeimidis in Van Grembergen, 2001). The primary purpose of evaluation, in addition to providing insight into prior or existing initiatives, is to enable reflection and assist in the identification of more effective future transformation initiatives (Crossland, 2010; Van Grembergen, 2000; Bush et al., 2009).

The issue of evaluation is inarguably complex and multi-dimensional, which accounts for why many organisations find the evaluation of Business Benefits of IS Investments a challenge. This, despite IS expenditures being the fastest growing investment category in the last 3 years, when most other budgets were being subjected to austerity measures (Luftman and Zadeh, 2011; Luftman et al., 2012; 2013; Ward and Daniel, 2012).

Whereas the subject of Business/IS alignment has claimed the interest of researchers and IS Management for the last three decades and beyond, the issue of the evaluation of those alignment efforts and their successes, has only received increasing attention since the 1990's, when CIOs and shareholders began to demand an accounting of returns on increasing IS capital expenditures. This new requirement was prompted by the preceding era's Productivity Paradox of "we see computers everywhere except in productivity statistics" (Salow, 1987 in Gomez and Pather, 2012, p.3), which paradoxically uncovered the same challenges as still experienced today, such as the lack of appropriate evaluation approaches accounting for the failure to conduct evaluation on a myriad of aggregated benefits (Crossland, 2012; Serafeimidis, in Van Grembergen 2001), as discussed in the previous section. This observed paradox necessitated the adaptation of financial modelling for application in the IS field, in an effort to improve understanding of the impact of IS Investments on business benefits (Kumar, 2004). As Chang and Young (1995, p.5) so aptly observed "...organisations can effectively improve only that which they can effectively measure".

Evaluation is not only multi-dimensional; it is also multi-disciplinary, providing various ways in which it may be conducted (Kyobe, 2008). Depending on the perceptions of the different stakeholders conducting evaluation, it can also be subjective. Furthermore, the perceptions of each consulted stakeholder may vary at different stages of the lifecycle of a benefit as previously discussed elsewhere in this study (Crossland, 2010; Larsen and Myers, 1999).

Four key approaches in evaluation modelling that have persisted over the last three decades are presented in the table below. The table is meant to provide a comparative view of existing and emergent trends in evaluation, taking into account the evaluation time-frame, the operationalisability of the approaches and challenges associated with each of them.

Table 1. Evaluation Theories: Findings in Literature (adapted from Serafeimidis in Van Grembergen, 2001)

	Financial Approaches	Real Options Approaches	Contingency / Holistic Approaches	Interpretive Approaches
Underlying Assumptions	- Enables direct comparison of Investment options	- Caters for risk and non-tangible benefits - Values usage of IT	- "No Silver Bullet" - Multi-dimensional - Dynamic (complimentary method) - Organisational differentiator - Differentiation of evaluation methods for differentiated utilisation benefits	- Accounts for dynamics such as culture, politics, environment on Benefits during their lifecycle, Caters for varied stakeholders viewpoints
Methodologies / Tools	- Net Present Value, Return on Investments, Internal Rate of return, Discounted Cash flow	Black-Scholes and Margrabe	Balanced Scorecard, IT Investment Mapping, Evaluation Lifecycle, Resource Based Valuation,	IT Value Perception, Surrogate measures (associated to external stakeholders), Simulation, Prototyping
Benefit-type applicable for	Hard (Tangible) and Quantifiable Benefits	Intangible	Tangible, Intangible, Indirect, Strategic	Intangible, Indirect, Strategic
Investment-type it measures	Operational	Infrastructural	Customised for each context (a "no silver bullet" approach)	Different approaches for different projects and contexts
Evaluation Time-frame	Used predominantly in pre-Investment as Justification	Continuous benefits lifecycle as options theory caters for time and other environmental risks	Continuous benefits lifecycle as permitted by the variety of approaches which are optimally used at different phases of the lifecycle	Continuous benefits lifecycle as guided by the context
Advantages	- Most used by practitioners - Best understood by practitioners	Employs economies of scale (users, transactions) Factors for risk associated with Intangible benefits realisation	Time and context sensitive Uses multi approaches simultaneously to deal with nuances resulting from the complex nature of benefits	- Dynamic and adaptable to environment High perception based approaches resulting in sustainable learning and 'intelligent' feedback (build understanding)
Practical Challenges of Approach	- Upfront measure to justify IS Investment - Short-term implementation focus - Not used much past project lifecycle - Benefits usually understated - Not able to evaluate "Soft" Benefits - Aggregated measure - Does not account for benefit contexts and risk (e.g. political, economic, social)	- Recommended over more traditional Financial Approaches	- Complex - Practitioners lack understanding of approach options, - no 'how-to' knowledge to conduct evaluation	- Works better for organisations with higher-maturity levels
Mitigators	- Real Options Theory - Contingency Theories	- Contingency / Holistic Approaches, Interpretive Approach	- Improve or build-up principles rather than 'how to' guidelines - Integrate more interpretive approaches for deeper understanding of underlying principles	Link better with Contingency Approaches for more holistic measurement
Operationalisability: Miller's "Case for Better Evaluation" (Thomas, 2010, p.415) - 'how to' guidelines accessibility, - Application adaptability, - Operational diversifiability - Outcomes correlativity, - Generalisability	Accessible guideline and easily generalisable but correlativity not reliable. Despite limitations posed by its inflexibility in application adaptability having (adaptability and diversifiability), easy to operationalise but output influence only at investment justification. No impact of transformative benefits	Meets most criteria for operationalisability with limitations. Has been validated mostly on infrastructural investment applications. Deals well with diversification as manages risk well	'How-to' guidelines and generalisability will be the biggest challenges to Operationalising as by definition each case is relatively unique.	OPPORTUNITY
Reference	Crossland, 2010; Glaglis et al., 1999; Kumar, 2004; Kyobe, 2008; Van Grembergen, 2001	Bardhan, Bagchi, & Sougstad, 2004; Kumar, 2004; McDowell & William, 2004	Gomez & Pather, 2012; Van Grembergen, 2001	Gomez and Pather (2012); Kyobe, 2008; Larsen & Myers, 1999; Van Grembergen, 2001

Further study would be required to test Miller's guidelines to determine whether IS Investment impact on Business Benefits and the issue of non-evaluation stems exactly from the absence of these conditions being met, when organisations attempt to bridge the theory-practice evaluation divide. The next section focuses on considerations for investing in IS.

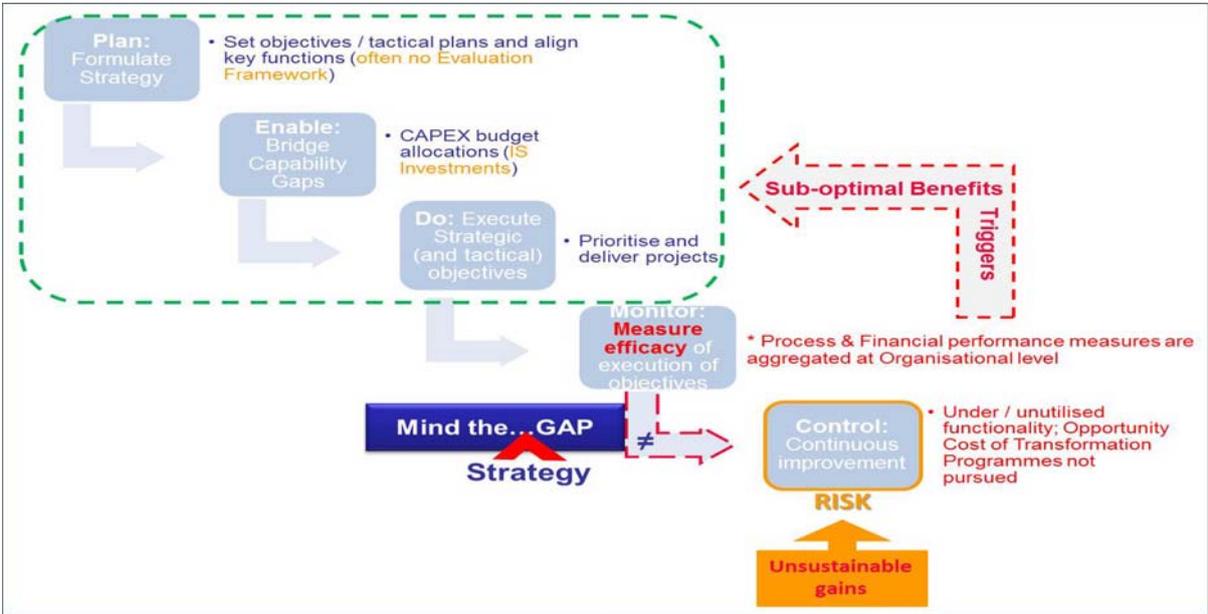
5. Literature Gap Analysis

The preceding discussion of findings from a review of literature was intended to contextualise and promote a common understanding of the challenges in evaluating Business Benefits of IS Investments.

It is clear from the above discussion that the realisation of business benefits of IS Investments is not risk-free. It was found that while the usage of IS plays a key role in determining the business benefits of IS Investments, those benefits must necessarily accrue not just when IT usage comes into play but also its capabilities and resources, and in the appropriate mix for the required business benefits to be realised. This is further made complex by the plethora of evaluation theories and the lack of consensus around their application amongst academicians, leaving practitioners without clear guidelines on 'how-to' conduct evaluation of IS Investments on aggregated Business Benefits (Kumar, 2004; Ravichandran & Lertwongsatien, 2005; Thomas, 2010; Ward & Daniel, 2012).

The failure to operationalize evaluation approaches indicates that IS's contribution to the attainment of business objectives would remain unquantified and unquantifiable in practice, due to an inability to apply theoretical frameworks to assist with disaggregation functions. As this does not allow for effective evaluation and efficient IS Investment decision-making, the unintended consequences of IS Investments would be unabated, as business continued risking uninformed follow-on investment decisions that result in sub-optimal benefit triggers. The above analysis is demonstrated in Figure 3, below.

Figure 3: Business Benefits Evaluation Impact – analysis the gap



Indeed, Ravichandran & Lertwongsatien's observation that "Investing in IT is not a necessary and sufficient condition for improving (organisational) performance, since IT investments might be wasted" (2005, p. 240), continues to prove true. Table 1 in Section 4.3, further highlighted that unless concerted efforts to continuously improve and implement practical evaluation approaches to demonstrate the positive impact of IS on Business Benefits

(alignment achievement), the perception of IS as a business cost rather than an investment will continue to proliferate, leading back to the 'productivity paradox' bubble.

This study is intended to contribute to an improved understanding of the challenges of evaluating IS Investments contribution to Business Benefits, and in turn, to organisational performance, thus reducing the gap uncovered in this survey of literature.

6. Conclusion

To have success in Business / IS alignment efforts requires evaluation know-'how'. As the review of literature followed an inductive approach, three key dimensions emerged which are presented in Figure 1, section 4. These comprised the need for categorising IS Investment types to realise optimal value in IS form their usage; the need for the categorisation and disaggregation of benefits in order to attribute their individual values to Information Systems; and lastly, the need to identify the most optimal combination of contingent evaluation approaches based on the complex array of benefits and the contexts within which they are evaluated.

A possible shortcoming of this study could be considered its reliance on secondary data sources from previously published theoretical bodies of work, but for the argument that secondary sources are generally acceptable as a source of data (Strauss and Corbin, 1998 cited in Mukwasi and Seymour, 2012). Amongst the published works, there was a technical document and some on-line resources which were referenced as part of this study, however these can be considered to have been validated by the extensive list of published resources consulted (Trochim, 2006).

As the review of literature forms part of an on-going study whose objective it is to validate these findings using a case study approach (Yin, 2003), any remaining concerns, should be addressed in subsequent findings following case study completion. This study aims to contribute to an improved understanding of the value of IS Investments in generating Business Benefits that meet organisational objectives and organisational performance. This will be achieved by advancing theory on how to conduct effective IS Investment evaluation across all anticipated business benefits, hard, soft or strategic, using holistic evaluation methods.

7. References

- Bush, M., Lederer, A. L., Li, X., Palmisano, J., & Rao, S., (2009), "The Alignment of Information Systems with Organisational Objectives and Strategies in Health Care", *International Journal of Medical Informatics*, 78(7), 446-456.
- Chang, J. C-J., & King, W. R., (2003), "Measuring the performance of information systems: A Functional Scorecard", *Journal of Management Information Systems*, 22(1), 85-115.
- Chang, R. Y., & De Young, P., (1995), Measuring organizational improvement impact: a practical guide to successfully linking organizational improvement measures, California: Jossey-Bass Pfeiffer.
- Cline, M. K., & Guynes, S. C., (2001), "The Impact of Information Technology Investment on Enterprise Performance: A Case Study", *Information Systems Management*, Fall edition.
- Cronk, M. C., & Fitzgerald, E. P., (1999), "Understanding "IS Business Value": Derivation of Dimensions", *Logistics Information Management*, 12(1), 40-49.

-
- Crossland, M., (2010), "How Business Intelligence is Adding Value, Unpublished Technical Report, University of Cape Town.
- Dobson, P. J., (1999), "Approaches to Theory Use in Interpretive Case Studies – a Critical Realist Perspective", Paper presented at the 1999 Proc. 10th Australasian Conference on Information Systems, Retrieved from March 2014 from UCT Seminar.
- Giaglis, G. M., Mylonopoulos, N., & Doukidis, G. I., (1999), "The ISSUE Methodology for Quantifying Benefits from Information Systems", *Logistics Information Management*, 12(1-2), 1-2.
- Gomez, R., & Pather, S., (2012), "The ICT Evaluation: Are We Asking the Right Questions?" *The Electronic Journal on Information Systems in Developing Countries*, 50(5), 1-14.
- Janulaitis, V., (2013), "Top 10 issues for CIOs in 2014", Retrieved April 13, 2014, from <http://blog.e-janco.com/2013/12/09/top-10-issues-cios-2014/>
- Kyobe, M., (2008), "Evaluating Information Security within SMEs engaged in E-commerce in South Africa", Institute for Small Business & Entrepreneurship, 5-7 November 2008, 1-16.
- Larsen, M. A., & Myers, M D., (1999), "When Success Turns into Failure: A Package-driven Business Process Re-engineering Project in the Financial Services Industry", *Journal of Strategic Information Systems*, 8(1999), 395-417.
- Li, D., Huang, W. W., Luftman, J. & Sha, W., (2010), "Key Issues in Information Systems Management: An empirical investigation from a Developing Country's Perspective", *Journal of Global Information Management (JGIM)*, 18(4), 19-35.
- Lin, C., & Pervan, G., (1991), A Review of IS/IT Investment Evaluation and Benefits Management Issues, problems and Processes, In W, Van Grembergen (Eds.), Information Technology Evaluation Methods and Management, Idea Group Publishing, 2-24.
- Luftman, J., & Zadeh, H. S., (2011), "Key Information Technology and Management Issues 2010-11: An international Study", *Journal of Information Technology*, 26(3), 193-204.
- Luftman J., Zadeh H. S., Derksen, B., Santana M., Rigoni, E. H., & Huang, Z., (2012), "Key Information Technology and Management Issues 2011-2012: An international Study", *Journal of Information Technology*, 27(3), 198-212.
- Luftman, J., Zadeh, H. S., Derksen, B., Santana, M., Rigoni, E. H., & Huang, Z. D., (2013), "Key Information Technology and Management Issues 2012–2013: An international Study", *Journal of Information Technology*, 28(4), 354-366.
- McKay, J., & Marshall, P., (2001), The IT Evaluation and Benefits Management Lifecycle, In W. Van Grembergen (Eds.), Information Technology Evaluation Methods and Management (pp. p.), Idea Group Publishing, 44-56.
- McDowell, R., & Simon, W. L., (2004), In Search of Business Value: Ensuring a Return on Your Technology Investment, Select Books.
- Mukwasi, C.M., & Seymour, L.F., (2012), "Enterprise Resource Planning Business Case Considerations: A Review for Small and Medium-Sized Enterprises", *Journal of Innovation Management in Small & Medium Enterprises*, 2012(2012), 1-15.
- Ram, K. L., (2004), "A framework for assessing the business value of information technology infrastructures", *Journal of Management Information Systems*, 21(2), 11-32.
- Ravichandran, T., & Lertwongsatien, C., (2005), "Effect of Information Systems Resources and Capabilities on Firm Performance: A Resource-Based Perspective", *Journal of Management Information Systems*, 21 (4), 237-276.

-
- Serafeimidis, V., (2001), A Review of Research Issues in Evaluation of Information Systems, In W. Van Grembergen (Eds.), Information Technology Evaluation Methods and Management, Idea Group Publishing, 58-77.
- Singh, A., & Harmon, G., (2003), "Measuring profitability impacts of information technology: Use of risk adjusted measures", *The American Society for Information Science and Technology*, 40(1), 95-100.
- Smith, H. A., McKeen, J. D., & Singh, S, (2007), Developing Information Technology Strategy for Business Value, *Journal of Information Technology Management*, 28(1), 49-58.
- Strassmann, P. A., (1998), Alignment is the Delivery of the Required Results, *Cutter IT Journal*, (8), Retrieved April 13, 2014, from <http://www.strassmann.com/pubs/alignment/>
- Sue, P., & Perez, A., (2006), IT Strategy and Business Strategy: A Path to Alignment, Chartwell Inc. Presentation, Retrieved March 6, 2014, from <http://www.irmac.ca/0506/IRMAC%20Presentation%2020060221.pdf>
- Thomas, V.G., (2010), The Case for Better Evaluation Theory: Comments on Miller, Kirkhart and Smith, *American Journal of Evaluation*, 31, p.414-417, Retrieved May 6, 2014, from <http://aje.sagepub.com/>
- Thorp, J., (2001), A Benefits Realisation Approach to IT Investments, In W. Van Grembergen (Eds.), *Information Technology Evaluation Methods and Management* (pp. p. 25-43), London: Idea Group Publishing.
- Trochim, W. M., (2006), *The Research Methods Knowledge Base*, (2nd ed), Retrieved April 23, 2014, from <http://www.socialresearchmethods.net/kb/>
- Walsham, G., (2006), Doing Interpretive Research, *European Journal of Information Systems*, 15, 320-330.
- Ward, J., & Daniel, E., (2012), *Benefits Management: How to Increase Business Value of Your IT Projects* (2nd ed.), Cornwall: John Wiley & Sons.
- Webster, J., & Watson, R.T., (2002), "Analyzing the Past to Prepare for the Future: Writing a Literature Review", *MIS Quarterly*, 26(2), 13-23.
- Yin, R. K., (2003), *Case study research: Design and Methods*, (5TH ed.), London: Sage Publications.