The Value of Business Intelligence Tools: Aligning Business Intelligence Governance with Corporate Governance

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Abstract— **Software vendors have developed Business Intelligence (BI) tools to provide an in-depth view about an organisation's customers, products and services. Use of BI tools by businesses has grown rapidly and expected to play a vital role in supporting the decision makers at all levels of an organisation. As these tools are becoming critical in the decision making process, it has become not only an information technology concern but also a management concern. Without proper governance it would be impractical to achieve the anticipated benefits that BI tools offer. Therefore, it is important to have a BI governance framework, which is a subset of corporate governance. In addition, proper alignment between corporate governance and BI governance can support staff at different hierarchical levels and ensure optimal value. This paper highlights the importance and business value of BI tools. Corporate governance and BI governance have been defined before outlining the steps for developing a BI governance framework. The alignment between BI governance and corporate governance has also been explored with a recommended model.**

Keywords- Business Intelligence, BI, BI governance, BI tools, Corporate governance, Goal alignment.

I. INTRODUCTION

Business Intelligence (BI) as a concept and as a tool has been widely highlighted in the literature especially in the strategic management discipline as well as the information systems discipline. BI is a process of applying tools and techniques to gather and analyse the data collected from multiple (both internal and external) sources, to create knowledge that helps in decision making [1]. The use of BI tools can also help improve profits by managing organisational corporate performance and gain competitive advantage through consolidation of past victories [2]. Although there are several benefits that BI tools offer, the main reasons for implementing BI include easy-to-use tools for data discovery, availability of industry specific or business context solutions [3] and renewed interest of senior managers.

A survey conducted by Gartner [4] revealed that BI and analytics ranked number one out of top 10 technology priorities by Chief Information Officers around the world. According to another report by Gartner [5], BI tools and other performance management software sales revenue reached about US$12.2b in 2011 compared to US$10.5b in 2010 demonstrating a 16.4% increase. The Gartner report also indicated that this is the fastest growing software sector and sales are expected to grow exponentially in the coming years. Another technology research company International Data Corporation (IDC) predicted that organisations will spend about $1.8 trillion in the same year to acquire BI software [6]. These predictions are further strengthened by the surveys done by The Corporate IT Forum, Morgan Franklin, TechTarget, SnapLogic and InformationWeek, indicating the importance of analytical tools for improvement in overall performance [6] thus prompting the need for BI governance.

BI governance focusses on designing, implementing and making effective use of BI tools to achieve business objectives and increase return on investments [7]. In order to achieve defined objectives, BI governance needs to be aligned with corporate governance. The alignment of corporate strategy and BI is stressed as the vital element in all BI related initiatives. The strategic use of BI is possible through the acquisition, collation, analysis, interpretation and exploitation of information in organisational business domains to support long term goals [8], [9].

BI tools are high-risk/high return projects and these tools are often expensive to implement [10]. The problem is exacerbated as BI tools are often used on an ad hoc basis and are not well implemented due to poor planning [11]. As a result organisations become data rich and information poor [12]. There is a lack of adequate development guidelines or frameworks that can aid in the systematic deployment of BI [13]. Hence to aid BI tools' deployment, it is important that organisations develop their own BI framework, as it helps to map organisational objectives to functional and individual levels

BI implementation failures can lead to loss of competitive advantage and financial instability. Hence, organisations need to adequately define the production, usage, ownership and presentation of information to create valuable BI. To better understand this linkage, this paper has been divided into three parts. Firstly, this paper highlights the importance and business value of BI tools. The paper then details key aspects of corporate governance and BI governance. The steps for developing a BI governance framework have been recommended. The steps can be utilised by organisations to tailor their own BI framework that is unique to their own requirements. Further on, section three also outlines the alignment between BI governance and corporate governance and recommends a model. Finally, the conclusion section summarises the key points, outlines the limitations of this paper and suggests directions for future research.

II. Importance and Business Value of BI Tools

Data and information are considered the most valuable assets in any organisation as they help employees to make decisions with confidence for the future. Huber, Piercy & McKeown [14] pointed out that BI refers to the use of data and information during the decision making process that helps to achieve competitive advantage. Decision makers at management and strategic levels need faster access to more recent, accurate and summarised data about their customers, products, possible demands for products and the market segments to make decisions that can have a long term impact on overall profits. BI tools help to capture data from multiple sources and allow users to analyse it in multiple dimensions. The main objective of BI tools is to convert data into meaningful and valuable information. According to Elbashir, Collier and Davern [15] BI systems offer analytical capabilities to create intelligence for decision making across many business activities. BI tools support managers in finding patterns and meanings in the data that was fed into the data warehouse by the transactional systems, enabling managers to make intelligent decisions [16].

Some of the key benefits of BI include more accuracy in predictions because of validated learning as it helps the user to gain insight into customer data to identify cross-selling and up-selling opportunities, or streamline operations to improve process efficiency and inventory management through understanding future demands for the products and services offered to customers [17]. Other benefits include support in improving operational efficiency, identifying root causes of problems and identifying wasted resources to reduce inventory costs [18]. As BI tools open up opportunities for organisations to improve corporate performance while maintaining competitive advantage, these systems are considered critical and a key part of any corporate strategy.

Employees working in each of the organisational levels namely operational, managerial and strategic, have different informational needs to solve structured, semi-structured and unstructured problems. Although operational level information systems (or transaction processing systems) can be helpful in operational levels, they would not necessarily be able to provide strong support to the decision makers in managerial and strategic levels because of their inability to summarise huge amounts of data resulting from day-to-day transactions [2]. A survey by Thompson [19] suggested that BI tools can help to generate faster and more accurate reporting to support decision making that can lead to improved customer service levels and improved profits. Williams & Williams [20] also pointed out that these tools help to improve both management and operational processes, because of their ability to support managers in planning, organising, leading and controlling. These tools also help in identifying potential customers, customer life-cycle value, fraud and customer attrition rates [21]. According to Williams & Williams [20] "business value of BI lies in its use within management processes which impact operational processes" [pg.3], which again supports the need to align BI tools at all levels of the organisation.

Software vendors such as SAP, Oracle, SAS, IBM, Microsoft and others have developed several BI tools which collect data from existing transactional systems and other sources (both structured and unstructured data) to generate valuable reports. These tools not only provide standardised reports but also allow users to analyse the data in multiple dimensions and carry out what-if scenarios or sensitivity analysis. Providing valuable insight into raw data and creating knowledge can be a challenging task and needs an effective governance framework.

III. Corporate Governance and BI Governance

Governance can be defined as making choices that outline objectives and assigning people with sufficient power and resources to carry out the tasks and verify the outcomes. It also helps align individual behaviour with organisational objectives. In other words, it is about making decisions to achieve goals and aligning behaviour with business goals through empowerment and monitoring. Corporate governance provides direction towards policies, processes, customs and rules that can help control and direct companies towards the achievement of goals [22]. It encapsulates the way companies conduct business and is considered important because it helps to boost the confidence of stakeholders, affects the overall work environment and general well-being of employees [23]. Effective governance can help to improve corporate performance levels and reduce the organisational exposure to risks [22] by allocating financial resources appropriately.

On the other hand, BI governance is crucial in organisations to effectively develop, implement and sustain BI efforts for a longer haul. Gutierrez [24] has defined BI governance from three unique perspectives – as a resource rationalisation exercise, as a series of guidelines and as the definition of roles and responsibilities for different stakeholders. Establishing BI governance will provide organisations a framework through which adequate resources can be channelled towards organisational strategies [24].

Based on the value that BI tools will provide and to ensure that sufficient value is garnered through the use of BI tools, the steps for developing a BI governance framework have been recommended in Figure 1. These steps should support organisations in understanding, designing, implementing and making effective use of BI tools in organisations and most importantly for designing their own BI governance framework.

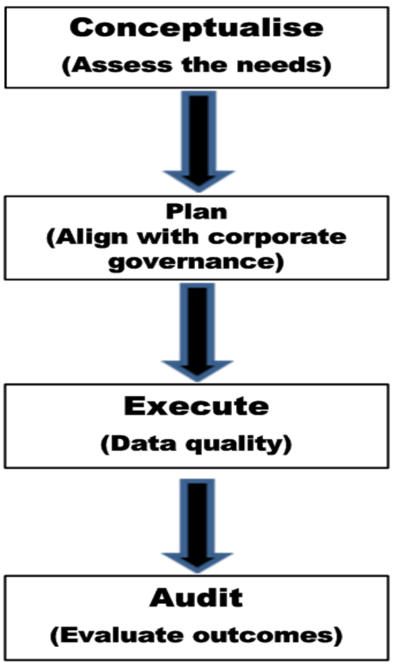

Fig.1 Steps for developing a BI governance framework

The four phases of developing a BI governance framework shown in Figure 1 demonstrate an iterative process, which begins with identifying and conceptualising the need of BI tools in an organisation, supporting business objectives through BI governance and importantly recognizing the organisational stakeholders. The next phase provides action plans to align BI tools at both individual and functional levels. It also provides plans for defining accountability and assigning authority, roles and responsibilities. During the execution phase, several issues relating to data quality (such as the right data standards, architecture and administration) are addressed. Data access, formatting, quality, security and training issues are also addressed in the third phase. In the final phase of auditing, the main focus is on measuring and analysing the outcomes and assessing the value against expectations. If there are any deviations from the intended outcomes or scope for improvement, they are identified and then the cycle begins again.

Implementing BI through a bottom-up approach that focuses more on implementing the technology without completely understanding its use at every level of organisation can lead to failures similar to ones experienced in previous IS projects [25]. This approach may guarantee project completion but may not link BI systems to processes and individuals. Top-down implementation approaches have worked well in past IS projects especially when project managers have vast technical insight and a big-picture perspective [25]. Hence this paper assumes that a similar approach will also work well for BI implementation. Therefore it is important to adopt a top-down approach which clarifies organisational strategies and supports BI at every level.

A BI governance framework can help managers to design and implement effective BI governance that is readily adaptable to an organisation's unique needs. In anticipation that adopting a BI governance framework in organisations will lead to common principles and clear ownership over information, the discussion now focusses on the nexus between BI governance and corporate governance. Tricker [26] has provided four viewpoints of corporate governance. Operationally the focus is on governance structures, processes and practices. Secondly from a relationship perspective, corporate governance specifies the distribution of rights and responsibilities amongst different stakeholders. From a financial perspective, corporate governance focuses on assuring stakeholders a return on investment. Lastly from a societal perspective, it focuses on the impact a company could have on its stakeholders due to its corporate behaviour. Hence in summary corporate governance refers to a set of systems, principles and processes through which a company is governed to ensure adequate financial and social returns.

Since BI implementations act as a strategic driver for organisations to assess and report on business processes [27] that have an impact on corporate governance, it is vital that the alignment between the two is explored. BI tools are an important constituent of a corporate governance strategy, helping enforce policy and measuring performance and adherence to governance directives [28]. Figure 2 provides a model outlining the alignment between a BI governance framework and corporate governance framework.

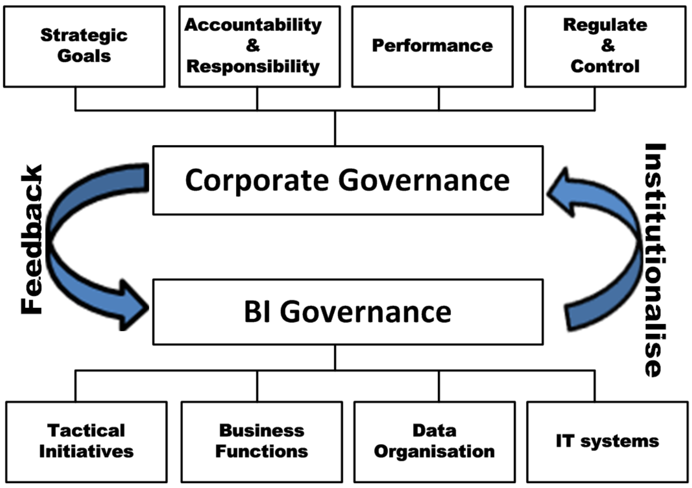

Fig.2 Model for aligning BI governance framework with corporate governance framework

In isolation, the corporate governance framework (figure 2) focusses on establishing strategic goals for an organisation, developing adequate processes and assigning responsibilities to employees, measuring performance and finally regulating and controlling processes to ensure that adequate returns on investment are delivered to the various stakeholders. The BI governance framework, in isolation, also paints an almost similar picture to the corporate governance framework although extensively focussed on the usage of BI tools. The BI framework (figure 2) focusses on developing long term strategic initiatives for the organisation that can help in the use of corporate information, assessing the different business functions and underlying processes. These can benefit from BI tools by organising data to ensure that it is clean and well-structured through the implementation of adequate data standards and architecture and finally by narrowing down the specific IT systems (hardware and software) that will be used for BI.

The corporate governance framework sits on top of the business governance framework so that it can closely align with organisational objectives and ensure that BI goals help in achieving corporate strategies too. Feedback from the corporate governance flows to guide the development and refinement of BI governance. It is also vital that BI governance outcomes are institutionalised into corporate governance and help achieve common strategic goals. Alignment between corporate governance and business governance framework will lead to the ability to work together towards organizational goals ensuring that BI tools deliver what the business actually needs.

Although the BI governance framework provides an approach to implementing BI tools, aligning BI governance with corporate governance can yield more benefits. The benefits of this alignment can be the linking of BI tools at the individual, functional and process levels that support overall business objectives. Ultimately BI governance should complement corporate governance procedures and help in achieving organisational strategic goals. The paper posits that if the steps for developing a BI framework are adopted by organisations and the BI framework is aligned with the corporate framework, BI deployment and usage will be successful with reduced risk levels

IV. Conclusion

Undoubtedly BI tools provide great value to organisations as it enables them to see data from multiple perspectives. BI tools empower organisations to gain insight into new markets, assess demand and suitability of products and services for different market segments and gauge the impact of marketing efforts. However these are only a few of the insights that BI tools can provide as the list could be very exhaustive. Whilst there seems to be a lot of buoyancy and expectation from the BI market, it does not come without the problems faced during BI deployment and also failure to gain expected benefits. In order to maximise the benefits of BI and ensure that it delivers historical, current and predictive views of organisational operations, it is necessary that a BI governance framework is developed. This paper outlined the benefits and the support BI analytical tools offer at different hierarchical levels. Steps for developing a BI governance framework have been recommended. These steps should support organisations in designing, implementing and making effective use of BI tools in organisations. Details relating to the importance of BI governance framework were discussed to offer an in-depth explanation of the benefits in aligning BI governance with corporate governance.

Organisations can utilise the steps for developing a BI governance framework for their own unique needs and further institutionalise it with the corporate governance framework to yield optimal benefits. However the model is not designed to replace any unique approaches that organisations may already have but rather supplement activities within the organisation so that the BI and corporate frameworks work together seamlessly not in isolation from each other. As BI tools provide a unified view of the business (single version of truth) and empowers employees at all levels with an in-depth view, it is important to have alignment between corporate and BI governance.

As with any research there are limitations with this paper. The results of the current study should be interpreted cautiously due to these possible limitations. One of the limitations is that it focussed on overall benefits of BI systems as provided by the existing literature. However assessing the benefits of BI systems based on industry case studies can offer a more in-depth view of the benefits. Although this paper proposed the framework for BI governance and corporate governance alignment, there are future research possibilities for identifying the need for BI governance teams and its role in ensuring BI success. The veracity of the model illustrating the alignment between BI governance framework and corporate governance has not been evaluated against any empirical data, thus its accuracy and utility in organisations remains open to future deliberation.

BI tools sales can be expected to grow rapidly in the coming years as businesses are striving to gain competitive advantage by utilising the data collected from transactional systems. Undoubtedly, BI tools can help businesses to gain insight into the data accumulated over a period of time. However, it would be impractical for organisations to adopt BI tools without clearly understanding the benefits. Therefore it can be concluded that developing an appropriate BI governance framework and further alignment between BI governance and corporate governance can ensure multiple benefits including competitive advantage and higher returns on investment. BI will offer many exciting opportunities for organisations in the future and it is crucial that organisations use a model similar to the one suggested in this paper to guide their efforts.

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