

THE EMERGENCE OF BIG DATA

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BIG DATA FOR SMALL BUSINESS A PRACTICAL APPROACH



“Business Intelligence (BI) has become a strategic initiative and is now recognized by business and technology leaders as instrumental in driving business effectiveness and innovation” <http://www.gartner.com/newsroom/id/500680>. Companies that have been successful in BI implementations have seen their investments in BI generate increases in revenue and produce cost savings equivalent to 100% return on investment (ROI).

Lila Rao-Graham

Many organisational BI initiatives struggle through a myriad of technology platforms, reporting tools and localized data sources that not only fail to deliver consistent information that can drive value-added and timely executives decision-making, but also expose the business to weakness in terms of data security, data access, data quality, and data scalability. In particular, the Small and Medium Size Enterprises (SMEs) that typify indigenous Caribbean organisations are often challenged by the complexity and resource requirements of traditional BI solutions. The design and implementing of the classical data warehouse architecture has proven to be technically and financially daunting for the average small business.

The emergence of Big Data in recent years, fuelled by the dramatically increased volume, variety and velocity of data being generated from sources such as eCommerce, social media, mobile phones and smart devices, has amplified the complexity and demands on Business Intelligence systems. The sheer volume of the datasets in this Big Data world, is increasingly beyond the capacity of traditional BI software tools to capture, store, manage and analyse.

Does this mean that the potential operational efficiency improvements, customer intimacy, and competitive benefits associated with business intelligence and big data analytics have become even more inaccessible to small businesses that are limited by resource and expertise constraints? Fortunately the availability of a rapidly maturing range of open source technology platforms such as Hadoop and MongoDB and Cloud computing services such as Cloudera (<http://www.cloudera.com/>) have made Big Data Analytics accessible and affordable to even the smallest organisations. Small business innovators can now access and use the most advanced Big Data technologies for a modest monthly expense, to give themselves a fighting chance in the increasingly global competitive landscape, where Sangster's Bookstore in Kingston, Jamaica must contend with the Amazons and Googles of the world.

However access to the technology is only the first step but is not sufficient to harness the benefits of big data and business

intelligence. SMEs need a systematic yet practical approach that allows them to rapidly assess baseline capabilities and discover value-adding opportunities for charting their own customized roadmap towards realizing the strategic benefits of business intelligence.

PROPOSED APPROACH

Through recent qualitative research and experimentation, we have developed a systematic, agile approach to BI implementation that is applicable to forward thinking SMEs, enabling them to evaluate the strategic potential of Business Intelligence for their organisations. This approach (see Figure 1) consists of four main steps and has as its output one or more high-impact proof-of-concept analytics applications, and a strategic BI roadmap:

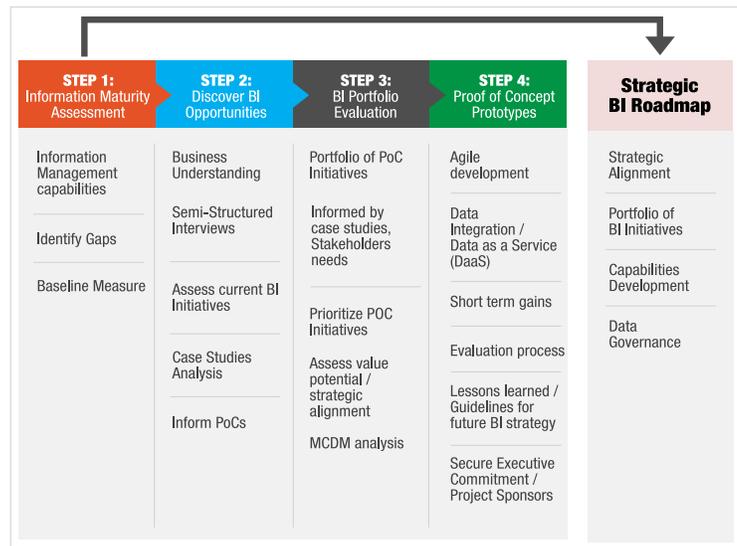


Figure 1 - Agile Approach for Strategic Business Intelligence

STEPS 1 & 2: INFORMATION MATURITY ASSESSMENT / BI OPPORTUNITY DISCOVERY

Many organisations make significant investments in vendor-specified BI tools without realizing any meaningful returns on these investments. This is often due to gaps in the information maturity

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(or readiness) of the business that inhibits the ability to effectively deploy and exploit BI tools and technologies. SME business leaders can ill afford the waste of already scarce financial and human resources on such adventures. Therefore, the foundation steps in this prescribed approach involves Information Maturity Assessment and BI Opportunity Discovery. The IM Assessment is based on a ►►

customized instrument that enables SMEs to baseline and benchmark their Information Management capabilities as the setting within which BI initiatives are conceptualized, developed and deployed, in order to deliver real business value to the organisation.

This maturity assessment examines six domains: *People/Organisation, Policy, Technology, Compliance, Measurement and Process/Practice*, in order to provide

SMEs have an opportunity to combine agility with their natural flexibility as a distinctive competitive advantage that typically eludes larger organisations confined by more formal structures and bureaucracy.

a business-wide assessment of the BI readiness of the organisation.

Although the IM assessment was designed to be typically self-administered for larger organisations, most SMEs are unlikely to have specialists in the various domains that the tool measures and therefore require external facilitation. The assessment is therefore conducted in parallel with semi-structured interviewing of the key business stakeholders as part of the Step 2 - *BI Opportunity Discovery*.

Step 2 provides a thorough understanding of the nature of the organisation's business, assessing any existing BI or data-driven initiatives. The information garnered at this stage is used to inform a set of BI Proof of Concepts (PoCs). As SMEs will likely have more generalist knowledge than specialist expertise, the ability of the facilitator (interviewer) to integrate the understanding of the business context with knowledge of industry-relevant, best-practice BI case studies and expertise in a broad range of BI application possibilities, is key to discovering the high-impact BI opportunities for the SME. The information garnered from these combined steps one and two, is used to develop a portfolio of BI Proof of Concepts Initiatives (PoCs).

STEP 3: BI PORTFOLIO EVALUATION

Once this portfolio of initiatives is created, given the likelihood of limited resources, there is a need to prioritize these initiatives by assessing the value impact of each. It may be the case that some of the PoCs are essential pre-requisites to overall BI effectiveness, but most will be discretionary based on business context and priority ranking. To maximize the engagement and buy-in of the SME business stakeholders in the overall BI initiative, a workshop is usually conducted to disseminate the findings from the IM assessment and stakeholder

interviews, discuss the value opportunities, and employ group decision-making techniques to reach consensus on the subset of BI POC initiatives to be implemented for the organisation.

STEP 4: PROOF OF CONCEPT PROTOTYPES

The selected PoC prototypes are developed, based on the available resources and appetite of the business. The ability to rapidly mobilize and deploy analytics PoC initiatives requires a flexible platform for connecting to heterogeneous, non-conventional sources of data to experiment, prototype, evaluate the various initiatives and better control the scope, cost, and timeline of their implementation/evaluation. This approach is quite different from the design-intensive classical Data Warehouse Architecture and several available open source platforms provide the requisite flexibility and enabling functionality such as "Data Virtualization" and "Data as a Service".

The PoC prototypes provide a practical demonstration of the value opportunities of BI for the business and the requisite time and resources required to realize these gains. Once the business decision-makers sign-off on the demonstrated outcomes, the working prototypes then require moderate incremental development effort for the accelerated deployment of high-impact production BI applications.

STRATEGIC BUSINESS INTELLIGENCE ROADMAP

In addition to the POC prototypes, this prescribed approach provides the business decision-makers with a strategic BI roadmap with a full portfolio of initiatives customized for the business, and designed in such a way, that the organisation can plan execution incrementally and in the correct sequence, based on its own capacity for change, without overcommitting financial or human resources.

LESSONS LEARNED

Based on our evaluation of this prescribed approach to Agile BI, in different organisational contexts in Jamaica, we believe the following factors are critical to the success of strategic BI for SMEs:

1. The Information Maturity Assessment is a key foundational step for understanding the business context, discovering high-impact

BI opportunities and mitigating the risk of misallocated initiatives and resources.

2. The use of rapid prototypes to demonstrate the business value of BI, is essential for SME business owners concerned about investing limited resources in BI initiatives without a good understanding of the value it can provide and the effort that will be required.
3. The use of Open Source software provides the benefits of reduced lead-time, cost, time-to-value and, importantly, increased opportunity for experimentation. These are important attributes for SMEs for whom agility, flexibility and a willingness to experiment are assets in competing with larger more bureaucratic organisations.
4. It is important to identify a high-level champion within the organisation to provide business context and facilitate executive stakeholder engagement.
5. Data quality is critical to BI success. Therefore, a formal data quality process must be a part of the BI roadmap.

CONCLUSION

We have referred to this approach as Agile, because it offers a flexible, participatory and iterative approach that allows small business managers to experiment with short term gains and evaluate the longer-term strategic opportunity for BI. However, there is another aspect of Agility to be considered. For SMEs to survive and compete globally with larger, more well-resourced organisations, then *Business Agility*- "the capacity of firms to sense and respond readily to a dynamic environment"- is an essential capability. SMEs have an opportunity to combine agility with their natural flexibility as a distinctive competitive advantage that typically eludes larger organisations confined by more formal structures and bureaucracy. Recent history is replete with evidence of smaller, more agile organisations that have leveraged Business Analytics to outcompete and overtake larger incumbents. Notable examples include: Netflix vs Blockbuster and Amazon vs Barnes & Noble

Organisations seeking to deploy Enterprise level BI, need an effective means of assessing the current state and maturity of their information management practices and to identify and address critical gaps that could present barriers and inhibit the desired returns on, and success of BI Investments. The prescribed methodology provides an approach that is amenable to, though not limited to SMEs. ■

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