

# Implementing a Business Intelligence System for Small and Medium-sized Enterprises

Go Muan Sang, Lai Xu, and Paul de Vrieze

Faculty of Science and Technology, Bournemouth University  
Poole, Dorset, BH12 5BB, UK  
{gsang, lxu, pdvrieze}@bournemouth.ac.uk

## Abstract

Over the years, Business Intelligence (BI) systems have become critically important to organizations due to the increasing fierce competition, the vast amount of daily generated data and the complexity of how to manage collected data. Business intelligence systems empower organizations to gain insights and to understand a clearer view of their vast data, business and customers, which help to make better decisions and hence produce better results and increase profit. BI refers to a collection of an organization's resources such as tools, technologies, applications, systems and databases which enable organizations to manage insights of their business data, activities and performance in order to make better decision. However the majority of existing BI systems, target and support large organizations, and the small and medium-sized organizations (SMEs) are mostly overlooked due to lack of substantial finance. The paper elaborates the considerations for implementing BI systems for SMEs. Some new trends such as cloud BI solutions, open BI sources solutions are reviewed. The paper finally provides for the implementation of Business Intelligence system for a SME, the purpose and constraints of the system are detailed.

Keywords: Business Intelligence (BI), Small and Medium-sized Enterprise (SME), Decision Support Systems, Business IT Alignment

## 1.0 Introduction

Today, businesses collect enormous amounts of data from their daily activities [1

Papers [2, 1] explain that BI is an enterprise architecture which includes the integrated collection of operations as well as decision support applications and databases that gives the business users easy access to their business informatio



Secondly, integrating data from different sources, applications and systems

Upon the outcome of the requirements and analysis phase, appropriate BI technologies need to be selected to maximize the success and delivery of requirements and expectations, prototyping is used in analysing the functional deliverables [16]. This process also includes technical architecture, data models such as dimensional models, and application design based on the requirements [13].



Figure2: BI Life Cycle (Adapted from [16])

### 3.0 Aspect of BI Technology

### 3.2 Open Source

The term open source software is defined by the Open Source Organization as “software that can be freely used, changed, and shared (in modified or unmodified form) by anyone”. An individual or organization can use open software by modifying the original sources or features to meet their needs free of charge. However it must be under the licenses which comply with the Open Source Definition.

One major distinctive advantage to the Open Source Approach is that it is available to organizations in which they can implement it in accordance with their goals, rather than a proprietary software vendor [

Advantage	Disadvantage
<ul style="list-style-type: none"><li>• Free to edit or modify</li><li>• Open source community provides a certain level of support and help</li><li>• Free to deploy some of commercial BIs such as Jasper, Panto, etc with a limited version</li></ul>	<ul style="list-style-type: none"><li>• Required IT expertise if change or</li></ul>



Insurance Group Z is an insurer of household gadgets and appliances based in UK. It is formed of two partner companies: A and B. Company A primarily insures household appliances whereas Company B covers both gadgets and appliances with affordable and competitive prices. Group Z currently has insured 8,000 customers. Both company A and B currently have two types of insurance policies, i.e. single product insurance policy and multi-product insurance policy. Both types of the insurance policies currently cover accidental, electronic and mechanical damages, loss and theft cover for over 50 products of appliances and gadgets. The current maximum number of covered product on a policy is 18 products

Company B is solely online oriented; the website where the customer can set up the policy and can make payment, and the online customer portal where customers can make claims, buy additional items, and download related policy documents. On the other hand, the sales of insurance product for Company A is internal oriented where the sales and retention teams dial existing and potential customers through the internal campaigns. Prospective customer leads are supplied by external parties on a daily basis in real time.

Insurance Group Z primarily uses over six SQL Server 2008 R databases storing for customer, policy, claim, payment and marketing data. Each database has APIs consumed by the company's systems such as CRM, Sales, Claims, Reports, etc. In addition, MySQL database is used for campaign dialler and call recording. However, these databases are not designed or optimized for BI, reports or related ad hoc queries. Thus this makes it difficult for business users to gain insights of business performance, customers and growth in efficient ways.

## 4.1 BI Application

### 4.1.1 Management Supported System

A management focused reporting system is designed and built, enabling the provision of information for business users and the addition of new reports as needed. A reporting database is used for storing raw and fact data as required. The primary purpose is for fast implementation and scaling due to no data warehouse.

### 4.1.2 Vicidial

Vicidial (Open Source Dialler) is used for the majority of the sales campaign

the Analyst to see what kind of data from a specific provider is generating more sales than another provider.

#### 4.1.4 RStudio with R

SMEs requires a new approach in order to manage insights of the businesses by implementing a BI solution, as various reasons discovered in the paper such as vendors targeted large enterprises, the capability of complex resources and finance. Hence some technology solutions were overviewed, and such as cloud based or SQL Server BI solution is most promising to meet SMEs' requirements.

Overall, it is the challenge for organizations, SME or Large, to discover new ideas and processes, define strategy and implement the findings into BI capability competition grows, and market and customer demands increase. Most of all, BI is the ultimate asset and tool, which will enable organizations to manage insights of their business and make better decisions.

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