

# The Effects of Using Business Intelligence Systems by Start-Up Companies: A Case Study

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**Abstract:** The rapid increase in data volumes in companies has meant that momentous and comprehensive information gathering is barely possible by manual means. Business intelligence solutions may be the way here. They provide tools to assist with the collection, integration, storage, editing, and analysis of existing data. While almost only large companies were interested in this topic a few years ago, it has meanwhile also become necessary for start-ups. Thus, the market for business intelligence has been growing for years. This article focuses on the potentials of using BI in start-ups. First, the providers of BI solutions for start-ups and the opportunities that exist for implementing BI systems in start-ups will be examined. Then the extent to which BI has prevailed, the areas in which the techniques of BI are used and the purpose BI has in start-ups will be shown. Finally, the success factors for BI projects in start-ups are considered.

**Index Terms - Business Intelligence, BI, BI-Projects, Market-Analysis, Decision-Making, Start-Ups, Algorithm, Design, Performance.**

## I. INTRODUCTION

With increasing globalization of markets, fierce competition, and the increasing speed of changes in market conditions and customer needs, all companies face new challenges. In the long run, only the companies who can adapt to these conditions and respond flexibly and quickly to changes while at the same time keeping their costs under control will be able to assert themselves. However, an exact knowledge of the current corporate and market situation is indispensable for this. To ensure this and to provide management with the information needed in their planning and decision-making, sophisticated systems are used. Today, the term Business Intelligence (BI) has become established both in practice and in research. BI describes approaches such as collecting, storing, processing, analysing and presenting company data.

In recent years, Business Intelligence has become one of the top topics in the international IT market. A few years ago, almost only large companies and corporations showed interest, but now this topic has become increasingly attractive for start-up companies. One reason for this is that BI software has become increasingly cheaper and more affordable for many start-ups. For example, the BI market is flooded by software vendors (such as SAP, Oracle, IBM, SAS, Microsoft, and open source vendors) that are specific to start-ups. On the other hand, increasing competitive pressure and the requirement to be able to rely on reliable information quickly and at all times ensure strong demand.

Against this background, the aim of this paper is to demonstrate the use of business intelligence in start-ups and to give an overview of the providers of business intelligence solutions that are suitable for start-up companies.

## II. BUSINESS INTELLIGENCE

According to Forrester Research, business intelligence is “a set of methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information used to enable more effective strategic, tactical, and operational insights and decision-making.”<sup>[1]</sup>

Business intelligence (BI) comprises the strategies and technologies used by enterprises for the data analysis of business information.<sup>[2]</sup> BI technologies provide historical, current and predictive views of business operations. Common functions of business intelligence technologies include reporting, online analytical processing, analytics, data mining, process mining, complex event processing, business performance management, benchmarking, text mining, predictive analytics and prescriptive analytics. BI technologies can handle large amounts of structured and sometimes unstructured data to help identify, develop and otherwise create new strategic business opportunities. They aim to allow for the easy interpretation of these big data. Identifying new opportunities and implementing an effective strategy based on insights can provide businesses with a competitive market advantage and long-term stability.<sup>[3]</sup>

In this paper, the following processes will be distinguished in BI architecture:

- Data gathering
- Data storage
- Knowledge management

Data collection is the process of gathering and measuring information on targeted variables in an established system, which then enables one to answer relevant questions and evaluate outcomes. The goal for all data collection is to capture quality evidence that allows analysis to lead to the formulation of convincing and credible answers to the questions that have been posed. Data storage is the recording (storing) of information (data) in a storage medium. Phonographic recording, magnetic tape, and optical discs, hard disk drives, thumb drives, etc. are all examples of storage media. In BI Data Warehouse and Data Marts are used. Knowledge management (KM) is the process of creating, sharing, using and managing the knowledge and information of an organization.<sup>[4]</sup> It refers to a multidisciplinary approach to achieving organizational objectives by making the best use of knowledge.<sup>[5]</sup>

## III. OBJECTIVES AND REQUIREMENTS

In business, it is important to have sufficient, high-quality information and KPIs (key performance indicators) as the basis for decisions. Using Business Intelligence has three main objectives: -

- Improvement of decision basis

- Increasing the transparency of corporate actions
- Demonstrate the relationships between solitary information

Almost every business can benefit from the use of business intelligence, but the right conditions to successfully implement business intelligence are not always present. It's not just about the technical prerequisites, but also questions of corporate culture and the way in which business intelligence is approached. Essentially, the three requirements for BI can be represented as follows:

- Willingness to question and challenge things existing for a long time
- Unconventional thinking
- Management attention

#### IV. BUSINESS INTELLIGENCE PROVIDERS FOR START-UPS

Large Providers: SAP, Oracle, IBM, SAS, Microsoft.

Open-source Vendors: Jaspersoft, Pentaho, Jedox, SpagoBI.

In addition to the five large providers, start-up companies like to deal with open-source vendors, such as Jaspersoft and SpagoBI, because they negotiate at eye level, have advantages in terms of local presence and support or know-how for certain tasks or industries. It can be said that the providers of open source BI solutions for start-ups are well represented. In addition to a free version, they also offer a commercial version of their software, which can often be purchased cheaper than that of the significant providers.

#### V. USE OF BUSINESS INTELLIGENCE IN START-UPS

BI systems are used in start-ups for access to up-to-date and reliable data at all times. Be it inventory management, financial accounting or storage costs, BI helps to visualize data and to plan well. Especially for start-ups, BI systems offer a huge competitive advantage. Without a BI system, the development of a report requires enormous effort: tons of numbers are extracted from Excel spreadsheets, billing systems, and other programs. This goes through the hands of various employees. Such a procedure not only costs valuable working time, but it also carries the risk of transmission errors. If a systematic BI solution is used instead, the data is extracted and handled fully automatically. This significantly reduces both the risk of errors and saves human resources. In start-ups, where individual employees often manage several areas of responsibility, this means a considerable relief.

Business intelligence is used in start-ups mainly by controlling (89 percent), followed by management (70 percent) and sales (57 percent). As shown in the following figure.

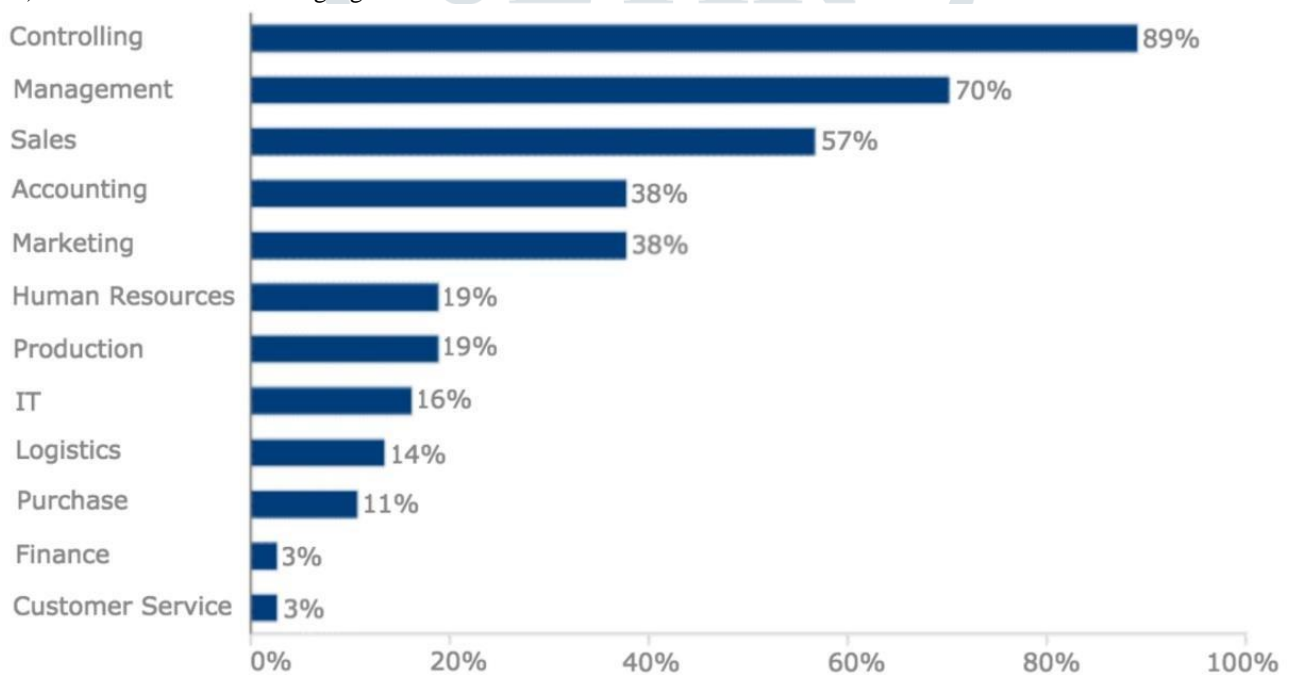
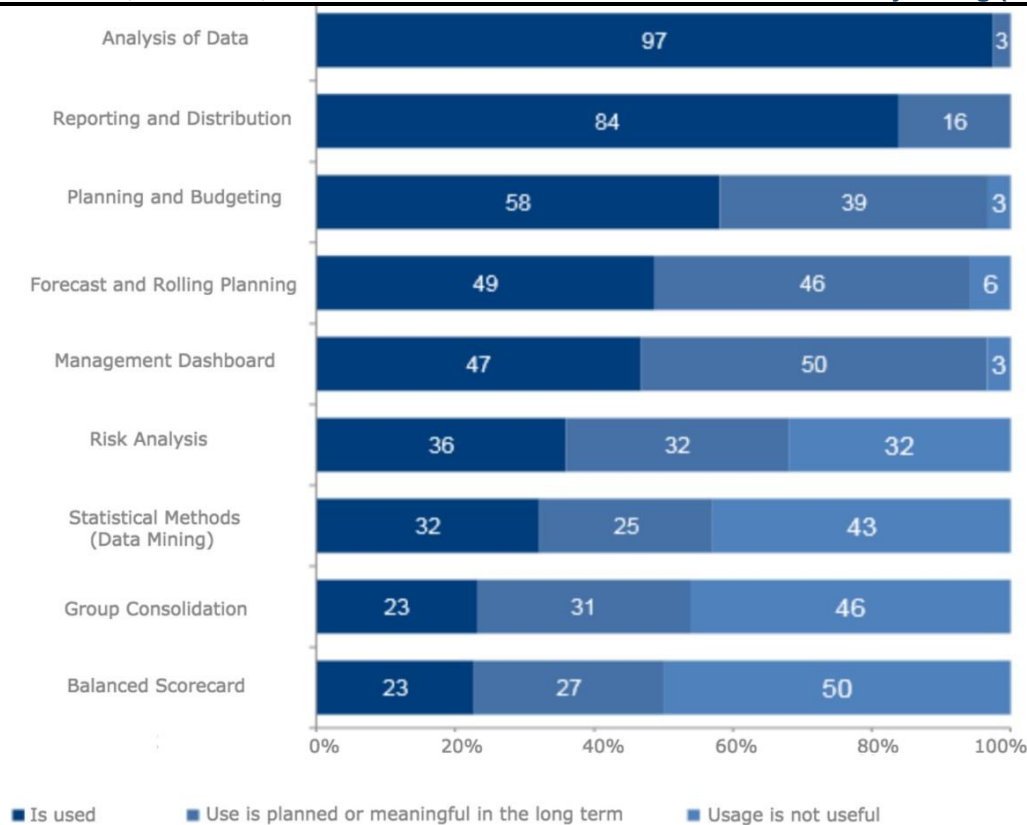


Figure 1: Application Areas of BI in Start-Ups<sup>[6]</sup>

The areas of application of BI in start-ups show that they still tend to be used in classic departments. Controlling, as central processing, business data reporting, and planning entity uses BI software to support these tasks. Management uses BI data to extract decision-relevant information. Sales use BI primarily for customer-related analysis.

Almost all start-up companies use business intelligence in data analytics (97 percent), 84 percent focus on report generation and distribution, 58 percent on planning and budgeting, and 49 percent on forecasting and rolling planning. However, more than half (60 percent) of the start-up companies plan to introduce improved management dashboards in the future. 46 percent want to invest more in forecasting and 39 percent in revised planning.

The following figure shows the most common of the purpose of BI in start-ups.

Figure 2: Usage purpose of BI in Start-Ups<sup>[6]</sup>

## VI. RESULTS AND CONCLUSIONS

Business Intelligence is a relevant tool for successful management as well as start-ups. The BI systems convert the ever-increasing amounts of data of the individual operative systems into usable information. The BI tools for analysis and evaluation of the central database support the daily work of the executives and provide the basis for strategic decisions. Furthermore, the results of BI also serve the current company analysis. This can streamline business processes, improve customer and partner relationships, reduce costs, minimize risks, shorten processes, and gain competitive advantage.

The market for business intelligence has evolved steadily in recent years and is also heavily dominated by the most important and well-known providers such as SAP, Oracle, IBM, SAS and Microsoft. Also, some open-source vendors are gaining popularity. A rough market investigation shows that start-up companies like to buy open sources software vendors. It is anticipated that the adoption of BI solutions at start-up companies will continue to increase in the future, and thus more references from users will be available. As a result, BI applications will become more important and play an even more grave role in start-ups, as the demands continue to increase.

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