

CHAPTER SIX

Business Intelligence and Value-Based Management

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By Jerzy Surma (A Business Expert Press Book)



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CHAPTER 6

Business Intelligence and Value-Based Management

6.1. The Role of Information Capital in Enhancing the Value of an Enterprise

The various technologies and applications of business intelligence (BI) described earlier all have the potential to enhance the value of an enterprise. However, this value is often only potential value and is therefore hard to quantify. In this chapter, this problem will be investigated at length by examining value-based management¹ and the current trends in management. Studies of the relationship between the use of business decision support systems and the value of an enterprise are quite complex, as information assets are intangible. This issue merits special attention because the proper selection and application of innovative technologies may considerably enhance the value of an enterprise.

6.1.1. *Intangible Assets*

Tangible assets, such as financial resources, can be easily identified. They are the basis of financial analysis and are commonly accepted in determining the value of an enterprise. However, recent developments in business practices have led to an increased interest in determining the value of intangible assets. That is also how Robert Kaplan and Peter Norton's balanced scorecard concept emerged.² Business decision support systems are a part of information capital, which in turn is intangible. According to Kaplan and Norton, intangible assets fall into three categories that are essential for the realization of a company's strategy:

1. *Human capital.* Skills, abilities, and knowledge of employees.
2. *Organizational capital.* Organizational culture, quality of leadership, people's adjustment to strategic tasks, and their ability to share knowledge with others.
3. *Information capital.*

These resources are connected to the company's strategy by a strategy map (see Figure 6.1), and they belong to the learning and development perspective in the balanced scorecard. The realization of a strategy is supposed to enhance the value of an enterprise. A widely used method of determining the value of a company in the financial perspective is to work out its economic value added (EVA).³ The strategy map, as an attempt to represent the sources of value in the enterprise, is an extension of the value chain concept from chapter 3. There are a few vital differences between determining the value of intangibles and tangible and financial assets:⁴

- *Indirect value creation.* Intangibles seldom have direct influence on financial results. They usually influence the finance of an enterprise by a complex chain of cause-and-effect relationships.⁵ For instance, information capital has an impact on the decisive internal processes from the angle of creating value for customers, reducing the costs of realizing processes, or both. As a result, income growth, the reduction of operational costs, or both translate directly into the value of an enterprise, which is monitored by certain financial indicators grouped in the financial perspective.
- *Potential value.* The value of intangibles is potential—that is, it can be used to create the value of a company, but the investment itself in those assets does not make the value grow. Investment in intangibles that support internal processes but do not increase revenue from customers may even generate unexpected costs and reduce the value of the company.
- *Integration.* Intangibles hardly ever create value themselves, so they have to be integrated with other assets from the same perspective. For example, investments in information technology (IT) bring results only if they are integrated with training and suitable motivational programs for employees.⁶

- *Time.* The potential value chain generated by intangibles is strongly time dependent. The primary competitive advantage gained by the implementation of an innovative IT system may be rapidly lost if the competition imitates it. If intangibles are not properly managed, they may become outdated very fast, and that may have a negative influence on the value of an enterprise. The classic example is the implementation of an electronic ordering system by American Hospitals Supply, which initially generated superb financial results. However, after a few years, due to obsolete technology and the lack of modernization, it reduced the company's market position and hindered its development.⁷

6.1.2. Information Capital

Attitudes toward the use of IT such as BI in enterprises vary from an enthusiasm for IT to disappointment and harsh criticism. IT has become so ubiquitous that the services and products it produces have become almost invisible. An even stronger charge against IT is the argument that we are witnessing the twilight of the strategic value of IT systems.⁸ Among

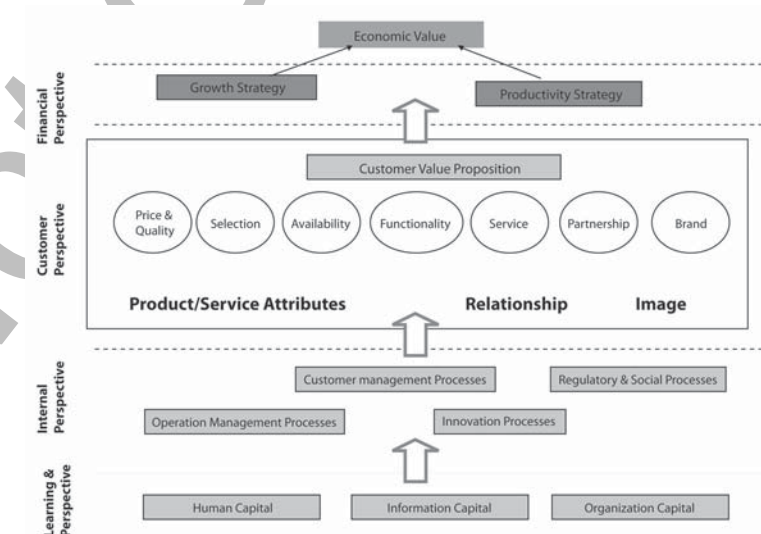


Figure 6.1. Role of intangibles in the strategy map.

Source: Based on Kaplan and Norton (2004).

such critical voices, Lester Thurow's reflection⁹ seems to be particularly important, despite being somewhat overstated: "There are single cases, where new technologies contributed to production growth and reduction of costs. However, when it comes to more general statements, there is no unambiguous evidence that new technologies enhanced productivity and profitability." Such a firm conclusion is based on situations in which IT systems are implemented without being clearly linked to enhancing the value of the company. Having said this, it should be stressed that the failure to implement IT technologies properly does not automatically imply that they have no influence on the competitive advantage of a company. Instead, we should pay attention to the revolutionary impact of IT on the contemporary economy. Such criticism seems to emphasize how difficult it is to select, implement, and keep appropriate IT solutions up and running. The recent rapid development of IT systems implies countless classifications and attempts at their synthesis. Kaplan and Norton suggested the division of information capital, as is shown in Table 6.1. IT infrastructure allows for the application of two basic kinds of programs: transactional and analytical systems. Both can be the basis of transformation applications, which determine the business model of the company. Analytical applications—that is, BI systems—are information capital.

Case Study 6.1 shows a strategic map for a chain store.

Table 6.1. Information Capital

Category	Description
Transformation applications	Systems that modify and determine the business model of the enterprise.
Analytical applications	Systems that promote analysis, interpretation, and sharing of information and knowledge: business intelligence system.
Transactional systems	Systems making repeatable transactions that support the company's core business processes. The most popular examples in this group are IT management systems, ERP, or customer account banking systems. Technologically, such systems are constructed by database management systems and application servers, which ensure security and cohesion of online transaction processing (OLTP).
Technological infrastructure	Technologies (such as computer hardware and software), network infrastructure, and adequate security and quality standards, etc. They are necessary to use and keep IT applications up and running.

Source: Based on Kaplan and Norton (2004).

Case Study 6.1

Here is a fragment of the strategy map for the chain store ALFA (see figure 6.2), which was devised from the company's strategy (see Case Study 1.1), which includes the following:

- *From the perspective of learning and growth*, implementation of the managerial dashboard and application of data-mining methods
- *From the perspective of internal processes*, improvement of logistics processes, merchandising optimization, and cost control

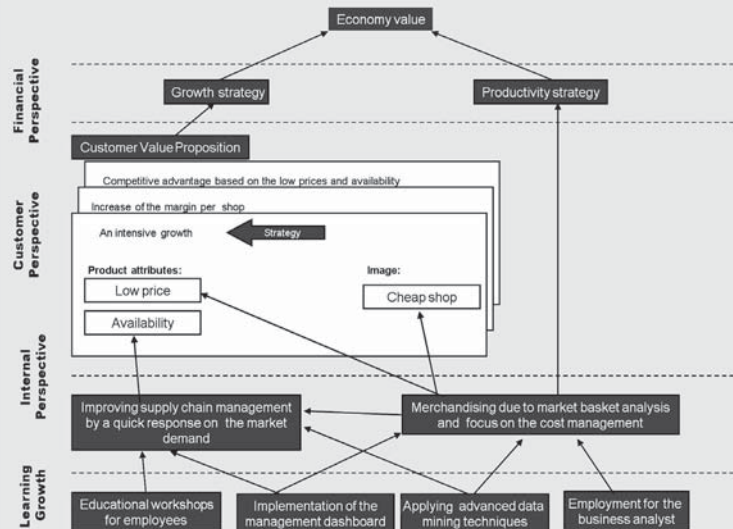


Figure 6.2. The ALFA chain store strategy map

Source: author.

6.2. Implementation Methodology

As mentioned before, even the most technologically sophisticated BI alone will not enhance the value of the company alone. It is crucial to connect it with the internal business processes of the company (see Figure 6.3) and take into account the organizational context and the human factor.¹⁰ The implementation methodology of a BI system should then meet the following conditions:

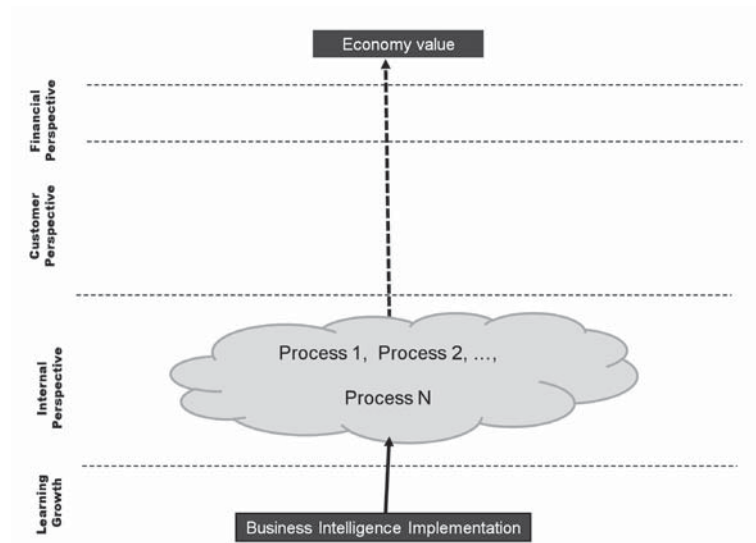


Figure 6.3. Indirect enhancement of value by implementing BI.

Source: author.

1. In the context of indirect and potential enhancement of value, it should employ business process reengineering¹¹ and should have a positive influence on the value of the company.¹²
2. As for the human capital and organizational context, it should relate to change management.

Meeting these conditions (see Figure 6.4) is a prerequisite for the successful implementation of a BI project. If you want to show the relationship

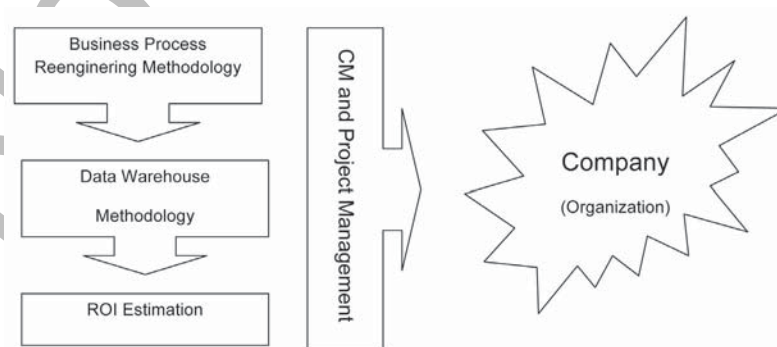


Figure 6.4. Holistic approach for the methodology of BI implementation.

Source: author.

to the economic value of the company, it is vital to adapt the whole to the strategy of the company and draw up clear-cut guidelines on the estimation of return on investment (ROI).¹³ It should consist of two stages:

- Stage 1: Analysis (see Figure 6.5)
 - Phase 1: Reference to the strategy
 - Phases 2–3: Business processes reengineering
 - Phase 4: Recommendations
- Stage 2: Implementation (see Figure 6.6)
 - Phases 5–6: Implementation of recommendations
 - Phases 7–8: Use and analysis of ROI

The link between stages 1 and 2 (from phases 4 to 6) is the management board strategic decision to implement the BI solutions devised by reengineering of the business processes. In most cases, it will be the

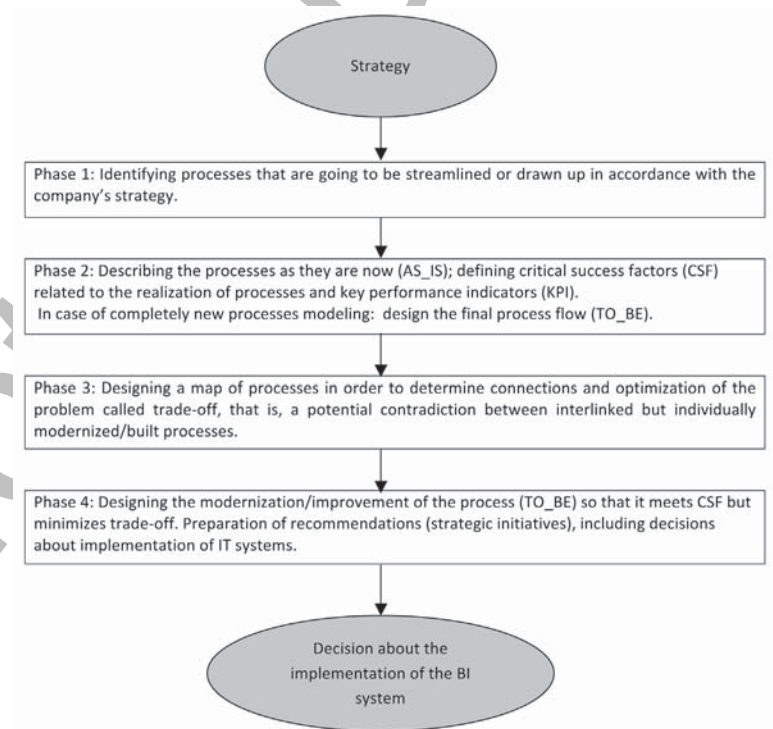


Figure 6.5. Stage 1: Analysis—referring to strategy and process reengineering.

Source: author.

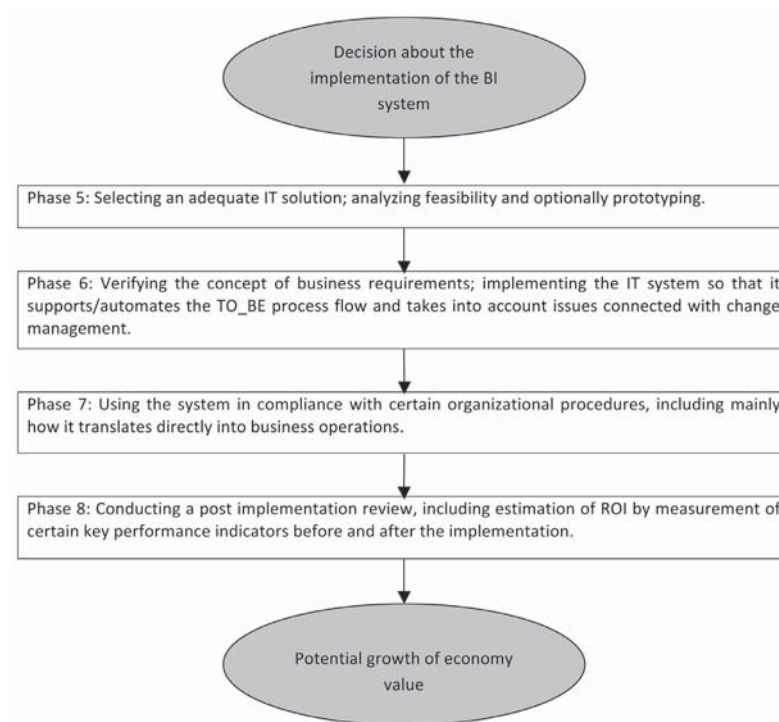


Figure 6.6. Stage 2: Implementation and use of the system.

Source: author.

implementation based on the data warehouse approach, as described in chapter 2. A review of the most common methods for implementing data warehouses can be found in O'Donnell's¹⁴ and Adelman and Moss's¹⁵ studies. The classic example is the SAS Rapid Methodology¹⁶ (see Figure 6.7). 6.8 shows how the results of the reengineering of business processes are transferred from the PROMET BPR methodology (from stage 1; see Figure 6.5) to the SAS Rapid Methodology (to stage 2; see Figure 6.6). If the system is designed to provide managerial information through online analytical processing (OLAP) tools, the integration is based on the following chain of connections:

strategy → processes → critical success factors (CSFs) → key performance indicators¹⁷ → implementation of the managerial information system

If the implementation of the strategic initiative requires the use of advanced data-mining techniques, then for phase 6 (see Figure 6.6)

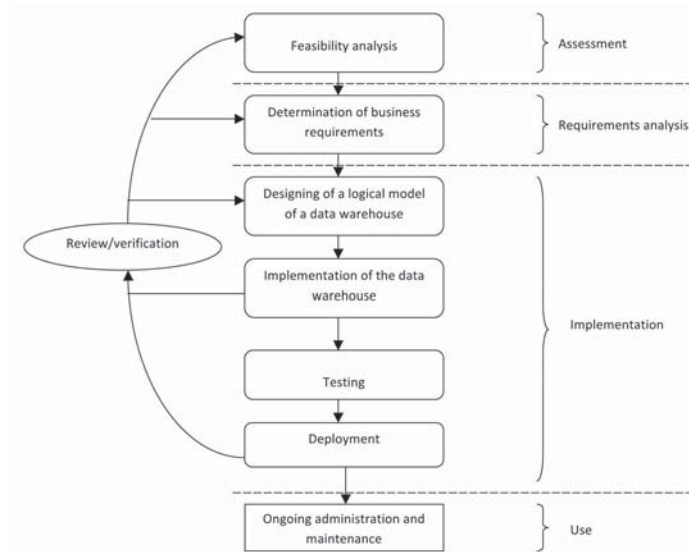


Figure 6.7. Stages of data warehouse designing.

Source: Based on SAS (2000).

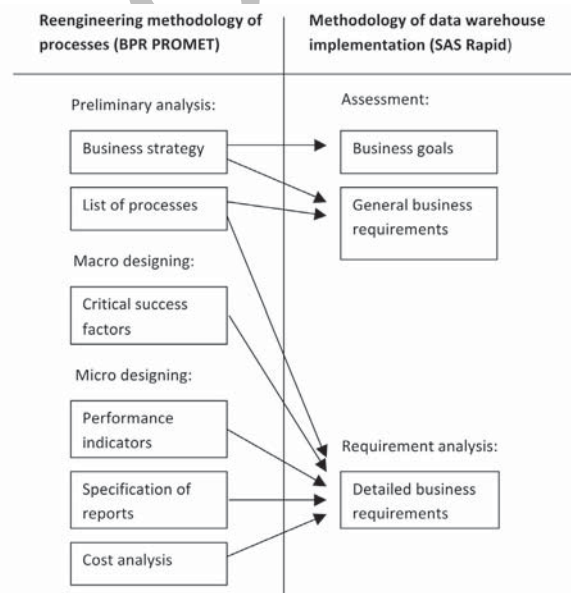


Figure 6.8. Linkage between the reengineering methodology of processes and the implementation methodology (PROMET BPR versus SAS Rapid Methodology).

Source: author.

you will have to use of the specialized methodology of data-mining methods (i.e., the cross-industry standard process for data mining, or CRISP-DM).¹⁸ The transformation process from data in a data warehouse to potentially useful knowledge produced by means of CRISP-DM is shown in Figure 6.9 (see also chapter 4). It should be stressed that the aforementioned methodology (from reference to the strategy of the company to the evaluation of business profits from the BI implementation) is the most appropriate if the company has a clear-cut strategy. In such a strategy, business processes are identified first, and then the most suitable recommendations for BI application are matched to them. However, in practice, companies usually do not have a clear strategy for IT development, and investment decisions are made ad hoc, based on the principle “let’s implement system x in department y .”¹⁹

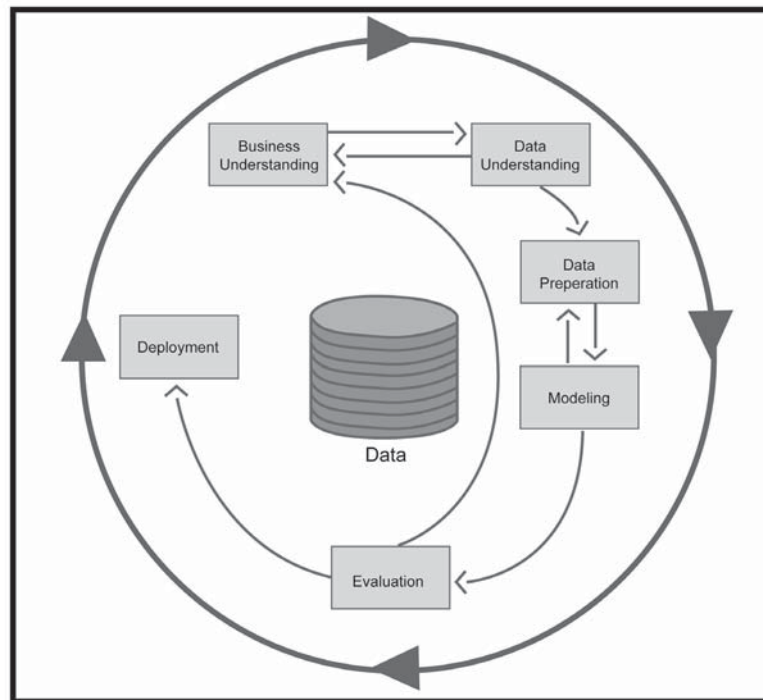


Figure 6.9. Phases of the CRISP-DM process model.

Source: <http://www.crisp-dm.org/Process/index.htm>

6.3. Levels of Support of Business Processes

IT systems support business processes by means of the following levels (see also chapter 3):²⁰

- *Automation.* The process already exists, but it is automated, and parameters such as cost, time, and optionally quality and flexibility are improved.
- *Improvement.* The process already exists, but it is improved.
- *New process.* The process did not exist before.

Each level of support will be discussed in the context of the previously mentioned four standard critical success factors (CSFs): time (duration), cost, quality, and flexibility (see chapter 3).

6.3.1. Automation

Automation of a business process decreases duration and improves the quality of generated products. For an illustration of the effect of automation on reporting activities (in controlling process), see the description in Table 6.2 and the summary of business benefits in Table 6.3.

Examples of critical success factors for the automation of reporting are quicker reporting and its high value, which are measured by the following indicators, respectively: delivery time of the report and the number of errors (see Figure 6.10). Improvement of both indicators can be directly used to estimate the reduction of costs, which along with the implementation cost can serve as the basis for the financial assessment of this investment. However, from the businesses' point of view, the automation of the

Table 6.2. Example: Automation of the process.

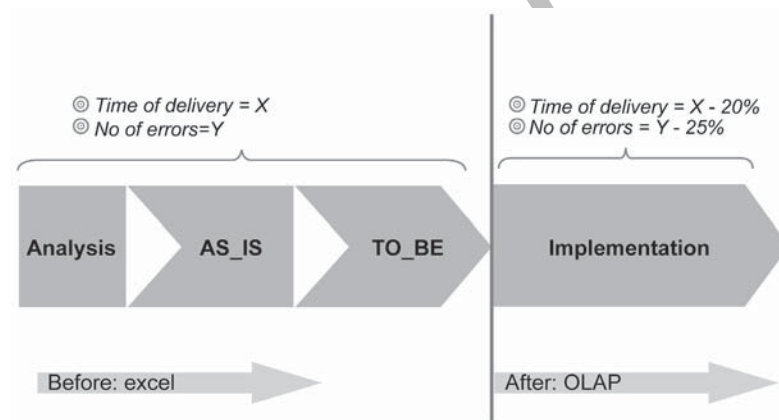
Process	Automation of the sales results reporting in the controlling process
Sector	Distribution and trade
Description	Implementation of the online analytical processing (OLAP) reporting system, which uses data warehouses and replaces manually generated Excel reports. Table 6.3 shows potential benefits from transition from AS_IS (Excel) to improvement TO_BE (OLAP tools).

Source: author.

Table 6.3. Business Profits From the Automation of Reporting Processes

Process CSF	Potential profit
Cost	Less people involved in preparing the report → reduction of costs
Quality	Less errors, higher quality of data, more thorough drill-down analysis, better visualization → • More comprehensive knowledge about the business issue → potential influence on income growth • Avoidance of time-consuming error correction → reduction of costs
Time	Much less time spent on preparing the report → • Earlier knowledge about business events, more time for the analysis, or both → potential influence on income growth • Reduction of costs

Source: author.

**Figure 6.10. Example: Measurement of the automation of report preparation.**

Source: author.

business process is the most obvious, but simultaneously the most dubious, way of using IT technologies. And then “the application of IT technology implies the automation of the process and consequently leads to its greater promptness. Automation of the process is the lowest level of change that can be accomplished through IT application.”²¹ The ROI can be controversially long, particularly if the implementation was costly, whereas the value added may seem to be hardly perceptible. Illustrative of this kind of BI application is the implementation of reporting systems in compliance with international accounting standards. In large corporations, the preparation of consolidated reports is likely to be such a time-consuming and

onerous task that the automation itself of such a process, which allows for the reduction of the human capital involved and improvement of the quality of reports, should be a rational justification for the implementation.

6.3.2. Improvement

The improvement of a business process consists of the modification of either the process itself or the manner in which the tasks are performed. As a result, the process becomes more effective. Unlike the automation of the process, where generally the process and its products remain unchanged, in the case of improvement, the end result of the streamlined process can be much better. As the example of the OLAP system shows, the proper use of a new reporting system can also serve as an example of improvement, such as when a manager takes advantage of the analytical capacity that gives him a deeper understanding of business events (see Table 6.4). Another example of the improvement of a process is the modernization of the planning process (see the description in Table 6.5 and summary of business benefits in Table 6.6).

Table 6.4. Business Benefits From Improvement of the Sales Analysis Process

Process CSF	Potential benefit
Flexibility	Possibility to generate queries ad hoc and nonstandard analyses → • Additional knowledge about business events → potential influence on income growth • Quick preparation of additional report (e.g., by drilling down and rolling up) → reduction of costs

Source: author.

Table 6.5. Example: Improvement of the Process

Process	Improvement of the process of planning demand
Sector	Production and sales of fast-moving consumer goods
Description	Implementation of the system generating support for the process of sales forecasting (demand planning) by means of econometric forecasting techniques Table 6.6 shows the potential benefits from the transition from AS_IS (forecasting based on intuition and experience) to improved process TO_BE (making use of results of an econometric model)

Source: author.

Table 6.6. Business From Improvement of the Process of Demand Planning

Process CSF	Potential benefit
Cost	No direct reduction of the cost of planning the process
Quality	More precise forecasting → • Long production cycles → reduction of production costs • Less stores → reduction of storage costs • Minimization of out-of-stock items → income growth
Time	Much less time spent on generating a forecast → potential income growth
Flexibility	The taking into account of additional factors (e.g., promotions, modified past data) → reduction of costs, potential income growth, or both

Source: author.

The improvement of business processes is the most common way in which BI supports the management of a company to potentially enhance its value. In fact, almost all the examples of its application shown in chapter 3 (Tables 3.15, 3.16, 3.17, 3.18) and chapter 4 (e.g., Table 4.6) are related to the improvement of processes.

6.3.3. New Process

Innovation in an enterprise—that is, the implementation of cutting-edge IT solutions—may demand a new business process that will fit into the company's existing internal processes. Usually, this process does not exist yet because it cannot function effectively without IT systems. This is typical of IT-driven processes, the existence of which depends on IT. Let us consider this issue by examining the example of the implementation of a marketing campaign management system (see description in Table 6.7).

As opposed to automation and improvement, in this case, you cannot show the difference between AS_IS and TO_BE because AS_IS does not exist when you create a new process (see Figure 6.4). Therefore, it is not possible to directly show the reduction of costs. Instead, the whole investment analysis focuses on an estimation of potential income growth. Here investments are usually connected with the implementation of transformation applications. Let us additionally consider the example of using market basket analysis (see Figure 6.11) to show the estimation of ROI. You carry

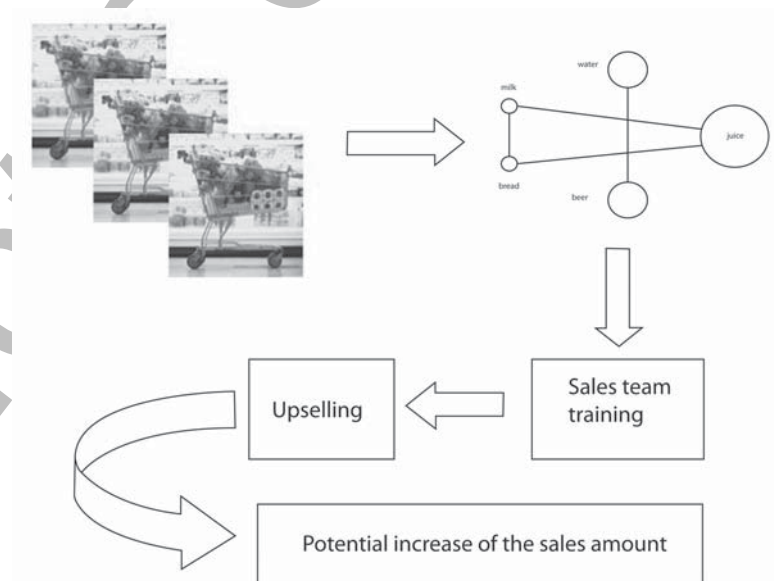
Table 6.7. Example: New process.

Process	Marketing campaign management system in order to reduce the number of customers who leave to competitors (churn)
Sector	GSM telecommunications
Description	Implementation of the marketing campaign system targeted at customers who are likely to leave and go to their competitors. The identification and offering of the most appropriate service to such customers demand the application of advanced analysis and data-mining techniques on great volumes of data registered in the billing system. This cannot be put into practice without BI tools.

Source: author.

out comparative research—that is, you compare stores in which associations between products in a market basket are analyzed and adequate operations are performed with stores in which such actions have not been taken. You can calculate an average market basket for both the first and second groups and consequently estimate the ROI. This will be further discussed in section 6.4.

Those examples reflect the business process reengineering approach, according to which “the real power of technology is not about improvement

**Figure 6.11. Analysis of the market basket as a new business process.**

Source: author.

of old processes, but about enabling companies to give up old principles and create new ways of doing their work, that is reengineering.”²² That’s why companies are often advised to use the process reference models implemented in IT systems (especially in enterprise resource planning systems) because they reflect the best business practices. These reference models are based on the experiences and knowledge of enterprises that participated in the implementation of earlier versions of the system. This is a kind of natural evolution of change in the organization during the implementation of an IT system, including BI implementation in particular.

6.3.4. Summary

There are three ways in which you can link BI with business processes: automation, improvement, and creation of a new process. It should be stressed that you can link BI with main (output), supporting, and managerial (controlling) processes, as they were defined in chapter 3. The last one plays a crucial role in BI applications, as they may be called metaprocesses, or processes that manage other processes. If you manage processes through key performance indicators (see chapter 3), you seem to naturally use BI tools. Although these days BI is normally used for controlling purposes,²³ the question of the cost of a controlling system versus the benefits of its implementation still needs to be addressed.

6.4. BI Implementation: Estimation of Return on Investment

The relationship between a company’s value and the implementation of an IT system (including a BI system) may be proved if the implementation is interpreted as an investment project. If the potential increase of a company’s value due to an investment project is measured by net present value (NPV), a direct relationship can be observed:

$$\text{NPV} > 0 \rightarrow \text{potential increase of company's value.}$$

We can talk here only about the potential increase of value because a concrete investment project does not exist in a vacuum. Quite the opposite, it shares resources with other processes and coexists with other investment projects. And that’s why the project itself may be successful as an

investment, but at the same time it may lead to losses in other areas (e.g., by key workers being overloaded with work), which result in a decrease in the company's value.

The financial interpretation of BI projects was first thoroughly discussed in an article by Steve and Nancy Williams.²⁴ From a financial point of view, the implementation of IT systems is a material investment, in which both basic and advanced profitability assessment methods can be employed. In practice, only basic methods are used: ROI, payback period, and discount methods, such as net present value, internal ROI, profitability ratio, and discount payback period. The interpretation of NPV is shown in Figure 6.12; the investment cost is in following years compensated by discount cash flows. The main problem with using financial investment assessment methods is the necessity to forecast the effect on the cash flow by a given investment. Such forecasts by definition have a wide margin of error. Positive cash flow can be generated by reducing costs (as in the example of a reporting system), and cash flow is relatively easy to estimate in the case of IT investments. However, cash flow resulting from profit growth (as in the example of a profit forecasting system) is extremely difficult to estimate. The profit growth depends on a combination of many factors that influence it at the same time. It is a highly complex issue to formally single out which of those factors increased profit and measure their share in the profit growth.

Another problem is an attempt to formalize factors that cannot be measured. As the example of an OLAP system shows (see Table 6.4), the accurate use of a new reporting system may give a manager a deeper

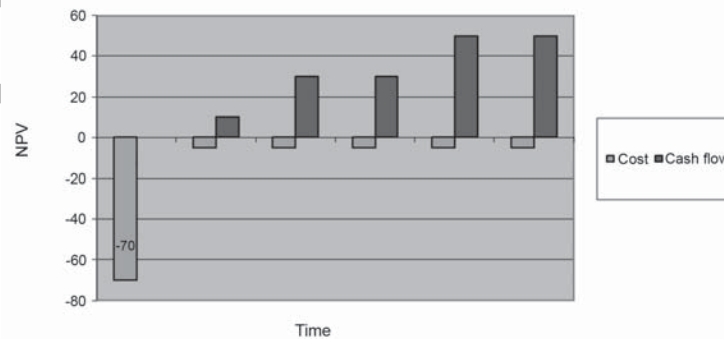


Figure 6.12. Calculation of NPV.

Source: author.

business insight. Let us assume that a sales manager finds out the next day rather than one week later about an unexpected growth in sales of a given product. Are we able to estimate the value of such information obtained a few days earlier? If adequate operations are performed, we may reduce so-called lost sales. And here the problem emerges of how we can measure the value of information. Let us consider the most vital problems that have an influence on the value that is attached to information:

1. *Amount.* The classic measurement of the amount stems from information theory (Claude Shannon's definition) and is based on entropy, which is of no use in business applications. In economic terms, the amount of information (value) should refer to practical value based on the extent to which it can satisfy human needs or to exchange value, that is, the possibility to exchange information for other goods.
2. *Accessibility.* The value of information decreases when an increasing number of people have access to it.
3. *Credibility of the source.* The value of information depends on the credibility of a provider.
4. *Usability.* The value of the information increases if a recipient can use it for practical purposes.
5. *Quality.* There is a relationship between the value of information and its quality, that is, whether a given message is true and complete.
6. *Context.* Experimental research proves that the subjective value of the information is subject to an endowment effect,²⁵ in which the value of a good in a salesperson's eyes is higher than in a purchaser's eyes.
7. *Life cycle.* The value of information depends on the time within which it is delivered to a user. Outdated information is usually worthless.
8. *Possible applications.* Information is of greater value if the same information can be simultaneously used by different people in an organization in different ways.
9. *Information symmetry or asymmetry.* It is a paradox that unless a purchaser obtains the given information, he or she does not know its content, but when it is revealed, he or she may not be interested in paying for it. It refers to the thesis according to which information

is an experience good, which means that it can be discovered exclusively through use.²⁶

Economic models, which deal with difficult but significant problems, are still in the pipeline; here David Lawrence's monograph is recommended.²⁷

6.5. Change Management and the Role of Human Capital

To measure the NPV, you naturally assume a certain ideal situation in which the implementation of an IT system is chosen wisely and is effectively used in a company. However, in practice, it too often happens that even the most appropriate decisions concerning technological implementation designed to enhance the company's value may turn out to be completely unwise if they are not effectively integrated with business processes, are rejected by users, or both. Technologies have to be accurately employed in order to support a concrete business process and should take into account the human factor; this is change management. As we know, intangibles hardly ever enhance the value of a company by themselves. They usually have to be combined with other assets from the same perspective. Reality often proves this thesis, and adequate change management is fundamental to the successful implementation of IT systems that support management. The implementation of IT systems based on useful project management know-how is now something obvious, but it is not enough to attain the final aim of the enhancement of a company's value. And that's why it is so important to manage change properly. In practice, this issue is usually ignored or treated intuitively without any methodological background. Change management aims to support the systematic human aspects and other critical factors for the success of the project, such as top executive support, team management, assessment of participants, and a proper communication between them. Participants are groups or people from within and without a company who have a direct influence on the project's advance, are under its direct or indirect influence, or both. Table 6.8 shows the tool designed to identify the participants and the relationships between them according to the PROMET Change Management methodology of the IMG company. The issue described in this chapter is combining information capital with

human and organizational capital—that is, the specific psychology of the implementation and use of IT systems. Users should perceive this implementation as added value resulting from the BI tool's usability, prestige, personal development, interest in technology, and so on. This issue may particularly gain importance in the future, when IT systems begin to directly influence managerial decisions.

The proper “immersion” of IT in an organization means the complete symbiosis with human and organization capital in terms of learning and development perspective of the balanced scorecard. In this context it is important to discover adequate CSFs. Here, apart from basic indicators such as quality, time, and cost (see CSF 1–2 in Table 6.9), “soft” indicators emerge concerning business applications and the users' involvement (see CSF 3–4 in Table 6.9).

Finally, it should be stressed that a decision maker should refer to the company's strategy by making use of a strategy map that indirectly connects the investments in IT technologies with the strategic aims of the company. First of all, it is fundamental to understand how the company's

Table 6.8. Tools for Identifying Participants of the Project

Document	Description
List of participants	It describes the roles and functions of participants.
Map of participants	It shows the roles of participants and the relationships between them. It serves also as a system of early warning against potential sources of conflict.
Relationships between participants	It describes what the relationships between the participants on the map are.
Matrix of opportunities and threats	It shows potential threats and opportunities for each of the participants. It should be verified after each stage.
Diagram of project environment	It shows how the participants and other factors, such as resources and other projects, influence the project and contribute to its success.
Communication strategy	It describes the information that must be exchanged between the participants and tools that facilitate it. The main aims of the communication strategy are • well-developed information policies, • involvement of all target groups, • communication tools optimization, • smooth information exchange.

Source: Based on PROMET (1997).

Table 6.9. Demonstration of the CSFs and KPIs for the Implementation and Maintenance of IT Systems

CSF	KPI
1. Proper realization of business requirements	• Percentage of proper realization of user requirements • Results of quality control tests
2. Effective use of budget and accessibility of the system in the accurate time	• Percentage of budget spending relative to project advance (earned value)
3. Understanding and full use by business users	• Ratio of users who work in reality to allocated ones • Number of successfully done trainings • Amount of use of nonstandard functions
4. Satisfaction of end users	• Questionnaire results

Source: author.

value is enhanced, but it also may show competition between departments and this “office politics” may be to the detriment of a department or to the business as a whole. This was previously mentioned as a trade-off problem in classic nonprocess organizations. Real life shows that building an effective strategy map is extremely difficult, particularly in the context of development and internal processes. And that’s why presidents of companies usually follow their intuition when making fundamental and far-reaching decisions, whereas the strategy map and NPV estimations only support strategic business decisions.

6.6. Conclusions

At present, the application of BI systems and their influence on the enhancement of a company’s value are not simply the subject of academic deliberations. These systems are employed in many companies, and in some cases they decide their competitive advantage. Indeed, you can compete by using cutting-edge BI techniques. Thomas Davenport and Jeanne Harris’s book²⁸ summarizes several years of observations and research in that respect in the American market. According to the authors, a company that competes against others by using analysis is an organization that has one or more distinct capacities on which its strategy is based. As a result, it uses advanced analytical techniques of both quantitative and qualitative data

and decision-making systems to support these capacities. A unique example of such an approach is Netflix, a mail-based DVD rental company.²⁹

In conclusion, BI systems can have a positive influence on a company's value by supporting managerial decisions when you reasonably take into account the following factors:

1. Indirect enhancement of a company's value. BI systems are potentially able to generate business value through a complex chain of cause-and-effect relationships, from the learning and development perspective to the financial perspective.
2. Accurate integration of BI systems with business processes. Real life proves that even accurate decisions about implementation of BI systems, which should theoretically enhance a company's value, may turn out to be poor if those systems are not properly integrated with business processes.
3. The human factor and accurate change management. These help to properly combine the technological aspect of implementation with human and organizational capital.
4. Effective selection of key performance indicators, which allows for reliable business processes management and consequently reliable estimation of the ROI.
5. Difficulty with the estimation of the value of managerial information, which is quite often the main value of BI systems. This may result in an underestimation of the ROI if only measurable factors are considered.

The last case study shows a relationship map of the participants in a BI implementation project and some of the project's problems.

Case Study 6.2

A pilot strategic project (initiative), an analysis of a shopping basket, brought excellent results. Consequently, the project was implemented across the whole chain of Alfa stores. However, it met with such strong emotional reactions in the company that a professional change management was required in this area. An external consultancy company devised a map of the key participants of the project (e.g., marketing and sales manager, regional managers) and the relationship between them (see Figure 6.13).

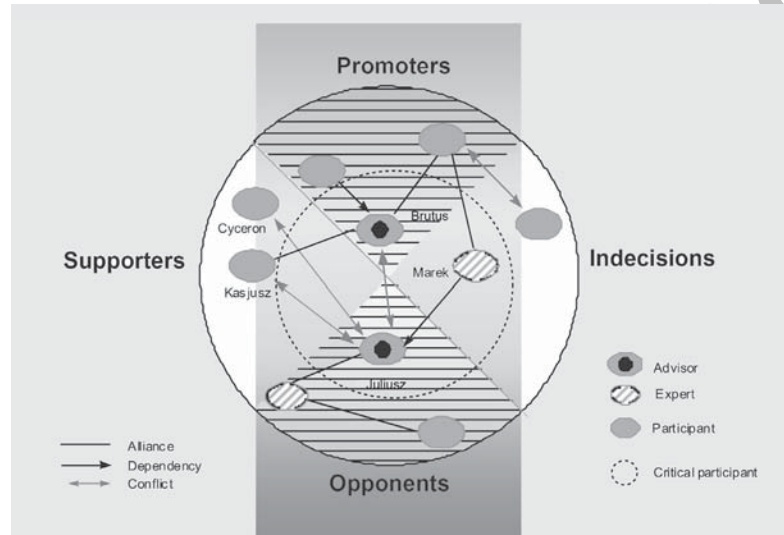


Figure 6.13. The key participants map

Source: PROMET (1997).

As real conflicts and resistance from some managers were discovered, training sessions were conducted and the results of the pilot project were presented. It turned out that some of these doubts stemmed from disbelief that analytical results (association rules) could be translated into the real activities of a store. To address this real threat and to be in line with the project methodology, which requires the integration of the BI system with business processes, a number of changes were made.

This new process aimed to generate additional sales through cashiers' activities, who, having observed the content of a given shopping basket, should offer additional products (see Figure 6.11). The manual for cashiers was prepared so that they would know exactly how to behave. Formally, the whole process was designed in accordance with an event-driven process chain³⁰ (EPC), in which all functions in the process, people who perform the functions, and events were described. One of the main deliverables of the whole process was the manual for the sales staff. In addition, the sales staff was thoroughly trained off-site. During this training, the whole process, including the way the manual was devised and the statistical grounds for it, was presented. Furthermore, a rewards system was introduced to motivate the sales staff to take advantage of the new approach.

Recommended Literature

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- Kohli, R., & Devaraj, S. (2002). *The IT payoff: Measuring the business value of information technology investments*. Upper Saddle River, NJ: Financial Times Press.
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Internet Resources

- Value Based Management Net. <http://www.valuebasedmanagement.net/>
- Project Management Institute. <http://www.pmi.org/>
- Executive Strategy Manager. <http://www.executivestrategymanager.com/>