http://www.dukagjinicollege.eu/sq/lajmet-.htmlPaving The Way To Making Better Decisions

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Abstract

The decision-making process is part of a broader subject usually referred to as problem solving, which refers to the process through which individuals try to bridge the gap between the current operating conditions of a system (as is) and the supposedly better conditions to be achieved in the future (to be).

***Key words**: Business Intelligence, Database Management, Decision-making*

A decision is a choice from multiple alternatives, usually made with a fair degree of rationality. Each individual faces on a continual basis decisions that can be more or less important, both in their personal and professional life. In this section, we will focus on decisions made by knowledge workers in public and private enterprises and organizations. These decisions may concern the development of a strategic plan and imply therefore substantial investment choices, the definition of marketing initiatives and related sales predictions, and the design of a production plan that allows the available human and technological resources to be employed in an effective and efficient way.

The decision-making process is part of a broader subject usually referred to as problem solving, which refers to the process through which individuals try to bridge the gap between the current operating conditions of a system (as is) and the supposedly better conditions to be achieved in the future (to be). In general, the transition of a system toward the desired state implies overcoming certain obstacles and is not easy to attain. This forces decision

makers to devise a set of alternative feasible options to achieve the desired goal, and then choose a decision based on a comparison between the advantages and disadvantages of each option. Hence, the decision selected must be put into practice and then verified to determine if it has enabled the planned objectives to be achieved. When this fails to happen, the problem is reconsidered, according to a recursive logic. (*Business intelligence; Carlo Vercellis; 2009*)

Over the years, a number of paradigms to describe the human decision making process have been proposed. Among them, the paradigm proposed by Simon (a Nobel laureate) is widely tested and used. It consists of three phases, i.e., intelligence, design, and choice. Later, another implementation phase to Simon's paradigm is added. In the intelligence phase, a decision maker observes the reality, and establishes an understanding of the problem domain and the associated opportunities. The necessary information pertaining to all aspects of the problem under scrutiny is also collected. In the design phase, the decision criteria and alternatives are developed by using a specific model, with the relevant uncontrollable events identified. The relationships between the decisions, alternatives and events have to be clearly specified and measured. This enables the decision alternatives to be evaluated logically in the next phase, i.e., the choice phase. Besides, actions that best meet the decision criteria are formulated. In the implementation phase, the decision maker needs to re-consider the decision analyses and evaluations, as well as to weigh the consequences of the recommendations. An implementation plan is then developed, with the necessary resources secured. It is now ready to put the implementation plan into action.

Notice that the decision making process is a continuous one within a feedback loop. This means that the decision maker should constantly re-consider and reevaluate the reality and changes in the problem domain. Upon obtaining new information, it is necessary to re-visit one or more, if not all, of the four phases involved. The feedback process allows alterations and improvements on previous decisions to be accomplished, so as to meet the current needs and demands of the problem domain. (*Handbook on decision making; Lakhmi C. Jain & Chee Peng Lim; 2010*)

What drives the desire for a BI program? We are led to believe that proper BI can lead to:

• **Increased profitabilit**; for example, according to financial consultants, in a typical retail bank portfolio, 20% of the accounts contribute profits equaling 200% of the overall return, whereas more than half of the accounts generate losses. Business intelligence can help business clients to evaluate customer lifetime value and short-term profitability expectations and to use this knowledge to distinguish between profitable and nonprofitable customers.

• **Decreased costs**; whether it is improved logistics management, lowered operational costs (such as decreased warehousing and delivery costs), or a decreasing of the investments required to make sales, B I can be used to help evaluate organizational costs.

• **Improved customer relationship management** (CRM)--This is basically a BI application that applies the analysis of aggregated customer information to provide improved customer service responsiveness, to discover cross-sell and up-sell opportunities, and to increase overall customer loyalty.

• **Decreased risk** Applying BI methods to credit data can improve credit risk analysis, whereas analyzing both supplier and consumer activity and reliability can provide insight into how to streamline the supply chain. (*Bussines intelligence the Savy's managers guide, David Loshin; 2003*)

Decision support systems

A decision support system (DSS) is an interactive computer-based application that combines data and mathematical models to help decision makers solve complex problems faced in managing the public and private enterprises and organizations. The term system is often used in everyday language: for instance, we refer to the solar system, the nervous system or the justice system. The entities that we intuitively denominate systems share a common characteristic, which we will adopt as an abstract definition of the notion of system: each of them is made up of a set of components that are in some way connected to each other so as to provide a single collective result and a common purpose.

Every system is characterized by boundaries that separate its internal components from the external environment. A system is said to be open if its boundaries can be crossed in both directions by flows of materials and information.

When such flows are lacking, the system is said to be closed. In general terms, any given system receives specific input flows, carries out an internal transformation process and generates observable output flows.

As can be imagined, this abstract definition of system can be used to describe a broad class of real-world phenomena. For example, the logistic structure of an enterprise is a system that receives as input a set of materials, services and information and returns as output a set of products, services and information. More generally, even an enterprise, taken as a whole or in part, may be represented in its turn as a system, provided the boundaries as well as input and output flows are clearly defined.

In connection with a decision-making process, whose structure will be described in later, it is often necessary to assess the performance of a system. For this purpose, it is appropriate to categorize the evaluation metrics into two main classes: effectiveness and efficiency.

Effectiveness. Effectiveness measurements express the level of conformity of a given system to the objectives for which it was designed. The associated performance indicators are therefore linked to the system output flows, such as production volumes, weekly sales and yield per share.

Efficiency. Efficiency measurements highlight the relationship between input flows used by the system and the corresponding output flows. Efficiency measurements are therefore associated with the quality of the transformation process.

For example, they might express the amount of resources needed to achieve a given sales volume.

Generally speaking, effectiveness metrics indicate whether the right action is being carried out or not, while efficiency metrics show whether the action is being carried out in the best possible way or not.

Since BI is an enterprise-wide evolving environment that is continually improved and enhanced based on feedback from the business community, the system development practices of the past are inadequate and inappropriate.

In the past, systems were never designed or built with integration in mind. Every system had a beginning and an end, and every system was designed to solve only one isolated problem for one set of business people from one line of business. The old "single-swim-lane" development practices were suitable for such static standalone

systems. However, they are not well suited for integrated BI initiatives because the old practices do not include any cross-organizational activities necessary to sustain an enterprise-wide decision-support environment. In the past, crossorganizational activities were not only deemed unnecessary but were also perceived to stand in the way of progress because they slowed down the projects.

For nonintegrated system development, conventional waterfall methodologies are sufficient. They provide enough guidance for planning, building, and implementing stand-alone systems. However, these traditional methodologies do not cover strategic planning, cross-organizational business analysis, or evaluation of new technologies with every project; nor do they embrace the concept of application releases. Traditional methodologies typically start with a functional business need, then concentrate on design and development, and finally end in maintenance.

Since BI applications are cross-organizational initiatives, an enterprise infrastructure must be created to support them. Some infrastructure components may already be in place before the first BI project is launched. Other infrastructure components may have to be developed over time as part of the BI projects. An enterprise infrastructure has two components:

Technical infrastructure, which includes hardware, software, middleware, database management systems, operating systems, network components, meta data repositories, utilities, and so on.

Nontechnical infrastructure, which includes meta data standards, datanaming standards, the enterprise logical data model (evolving), methodologies, guidelines, testing procedures, change-control processes, procedures for issues management and dispute resolution, and so on.

BI decision-support projects are extremely dynamic. Changes to scope, staff, budget, technology, business representatives, and sponsors can severely impact the success of a project. Therefore, project planning must be detailed, and actual progress must be closely watched and reported.

Data analysis

The biggest challenge to all BI decision-support projects is the quality of the source data. Bad habits developed over decades are difficult to break, and the damages resulting from bad habits are very expensive, time

consuming, and tedious to find and correct. In addition, data analysis in the past was confined to the view of one line of business and was never consolidated or reconciled with other views in the organization. This step takes a significant percentage of the time allotted to the entire project schedule.

Application Prototyping

Analysis of the functional deliverables, which used to be called system analysis, is best done through prototyping so it can be combined with application design. New tools and programming languages enable developers to relatively quickly prove or disprove a concept or an idea. Prototyping also allows business people to see the potential and the limits of the technology, which gives them an opportunity to adjust their project requirements and their expectations.

Database Design

One or more BI target databases will store the business data in detailed or aggregated form, depending on the reporting requirements of the business community. Not all reporting requirements are strategic, and not all of them are multidimensional. The database design schemas must match the information access requirements of the business community.

Extract/Transform/Load Design

The ETL process is the most complicated process of the entire BI decision-support project. It is also the least glamorous one. ETL processing windows (batch windows) are typically small, yet the poor quality of the source data usually requires a lot of time to run the transformation and cleansing programs. Finishing the ETL process within the available batch window is a challenge for most organizations.

Application Development

Once the prototyping effort has firmed up the functional requirements, true development of the access and analysis application can begin. Developing the application can be a simple matter of finalizing an operational prototype, or it can be a more involved development effort using different, more robust access and analysis tools. In either case, the front-end application development activities are usually performed in parallel with the activities of back-end ETL development and meta data repository development.

Data Mining

Many organizations do not use their BI decision-support environment to the fullest extent. BI applications are often limited to prewritten reports, some of which are not even new types of reports but replacements of old reports. The real payback comes from the information hidden in the organization's data, which can be discovered only with data mining tools.

Implementation

Once the team has thoroughly tested all components of the BI application, the team rolls out the databases and applications. Training is scheduled for the business staff and other stakeholders who will be using the BI application and the meta data repository. The support functions begin, which includes operating the help desk, maintaining the BI target databases, scheduling and running ETL batch jobs, monitoring performance, and tuning databases. (*Business intelligence roadmap; Larissa T. Moss & Shaku Atre; 2003*)

Because of the differences in production processes across industries and sectors, companies that operate in different industries tend to develop different vocabularies around the core operational processes of the business. For example, although food manufacturers talk of recipes and conversion processes, metal products manufacturers talk of bills of material and machining operations. Different production processes also cause industries to develop different performance measures, such as revenue or cost per ton-mile in the shipping industry or revenue per available room (revpar) in the hotel industry.

In addition to industry differences arising from fundamentally different production processes, industries also vary (Porter, 1980) with respect to the following:

• Economies of scale
• Degree of product differentiation
• Capital requirements
• Switching costs
• Access to distribution channels
• Potential cost advantages independent of scale
• Degree and intensity of competition
• Growth rates

Etc.

These differences between industries impact what BI information is relevant within a given industry and for a given competitor at a given time, thus raising the question posed

earlier: Can we usefully generalize about "how to do BI when treatments for various industries may be so different"? These differences suggest a broader strategic line of inquiry that considers the impact of industry, competition within the industry, and a given company's business design on the BI opportunities for a given company within a given industry. In our view, looking at industry alone is too static because there are different ways of competing within the same industry.

Those methods of competition can change over time as industries themselves evolve and mature and as their customers' needs evolve. More broadly, we try to establish that industries are dynamic, that the ways that companies compete within industries and industry segments are variable and dynamic, and that business designs are variable and dynamic. All those facts point to the conclusion that the way a given company uses BI ought to be customized to its specific circumstances.

That said, industrial economics is industrial economics, and all industries have customers and all companies use inputs and processes to deliver products or services to meet the needs of those customers. Further, the functions within businesses are common, for example, research and development (R&D) or service line development, operations, marketing, sales, finance, human resources, and administration. So although the permutations and combinations of value chain activities are many and although the bases of competition are different within different industries at different stages of industry maturity, it is fair to say that the building blocks with which a given business design is built are common piece parts. Accordingly, what we look at in determining the appropriate BI investments for a given company is the same, even though the optimal BI portfolio for a given company in a given industry will certainly vary. (*The profit impact of business intelligence; Steve and Nancy Williams; 2007*).

If we think of BI as business information and business analysis in support of factbased decisions in the context of business processes that impact profits, it quickly becomes clear that BI is a broad concept. The nature of business information varies along a number of dimensions, including:

- Whether the business information is about current business transactions and status or about transactions that occurred and were closed out in prior months or years

• Whether the business information is about the enterprise as a whole or about subunits of the organization such as strategic business units or functional departments

• Whether the information is about the company or about other entities in the value chain, such as customers and suppliers

• Whether the business information is generated by a company's internal information systems or whether it is obtained from external sources such as market research firms

• Whether the business information is used for management processes, revenuegenerating processes, or operating processes

• Whether the business information is detailed transactional information or summarized information about many transactions

• Whether the business information is intended to be directly accessed by end users or whether it exists as input to simulations and models

• Whether the business information is intended for power users, general users, or executives

• Whether the business information is intended for broad distribution or for more limited role-based use

• Whether the business information must be retained for legal or regulatory compliance purposes

The Main Tool Providers

The primary vendors in today's BI market range from the historical ones that have been in the BI segment for 10-plus years, and some newcomers. Some of the top players and a brief summary of their offerings, and business focus are:

• Microsoft. Analysis Services is a data component for the BI solution. Microsoft is a recent entry into the BI mix. They have relied on a spreadsheet (Excel) as the primary delivery component. They also promote a partner channel to foster the delivery component, and the leading vendor in this category is ProClarity Corporation with their ProClarity product line.

• Oracle. Famously known as the database vendor, they have also offered BI solution with Oracle Express. Again, this has been a traditional spreadsheet delivery mechanism. Express will be discontinued, and BI will be incorporated as part of future database solutions for Oracle.

• Hyperion. Essbase is the flagship product from Hyperion. Essbase information was traditionally accessed via an Excel

spreadsheet with a connection to the Essbase data source. They also have started offering web-based solutions, customer relationship management (CRM), and other horizontal markets.

• Cognos. Powerplay has been the flagship product in the past with strength of delivery in a spreadsheet. But in recent years Cognos has started to offer a wide variety of products to meet a variety of business needs. There are too many to recount here, but they are trying to cover all
the bases from web-based to desktop delivery in spreadsheets and graphical information.

• Applix. iTM1 server is the data component from Applix. In the past they relied on an Excel spreadsheet as the primary delivery component. However, in the past year they have expanded to offer solutions oriented around CRM, planning (financial), and others.

Considering the continous complexity of enterprise management and the necessity to make better decisions, business intelligence has become the main tool with which managers are trying to find the solutions that they need to solve the maze of enterprise problems. Yes, it is true that some of the main tools for business intelligence , such those from Oracle and Microsoft, are a bit expensive; however, the majority of large enterprises with huge profits have no issue in dealing with that. These tools make way for a faster and better decision-making, something that enterprises have strived to do many years ago when these tools were missing.

Today, competition is huge, consumer requirements always on the rise, and that makes the future hard to predict. This is the main reason why managers will use business intelligence in their path to success.

Conclusion

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