Strategic Business Analytics and Alternative Solutions from Decision Making Perspective

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Abstract
In today's digital world, Entrepreneurs make strategic decisions every day. Changes in technology, changes in organizational priorities, macroeconomic changes, and growth of global information capacity have been influenced substantial changes in decision making process. This paper refines the deep influence of the strategic busness analytics factors and the influence mechanism of these factors on the strategic decision making to optimize data gathering, analysis methodologies and enhance the alternative solutions to make decisions based on the optimal solution.

Keywords:
Decision Making; Strategic Business Analytics; Alternative Solutions Analysis; Information Systems Components.

1. Introduction

The ability to extract and present information in a meaningful way is vital to business success. Regardless of where they sit, Entrepreneurs need the ability to transform data into actionable insight. Executives need aggregated data that captures a complete view of the company and its operations if they are to measure performance and respond proactively to changes in the marketplace and the industry. Managers, teams, and individuals need the ability to find, share, and use information from across all areas of the business to perform tasks effectively and monitor business operations. We focus here on a new and different perspective to analyze sufficient information to give to the decision maker. In this paper we illuminate a new and different perspective to analyze sufficient information to enhance decision making process. We analyze factors like software, hardware, people that have been used to gather and analyze needed information. We have to realize that we are working on more than one level of information, and the rise in the level means less in terms of quantity, and more in terms of importance. So we will work to ensure containment of the top level for each data that must be transformed to become the way to best decision.

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2. Factors Analysis Method

In this Method, the components of information systems are the essential factors and will be analyzed to produce information which will be used in making the decision, while the software is used to analyze hardware, data and people. It will be analyzed to determine the validity and the effectiveness of the Results. We cannot ignore the amount of information that can result by using this method, while striving to provide the right amount to make the best decision. This amount of information may result in difficulties in process and extraction and due to the need to organize the information we use two types of data, Date-Time Data and Location Data as a separated factors. The new additional part on this method is considering the need of analysis to the 6 items (see Fig. 1):

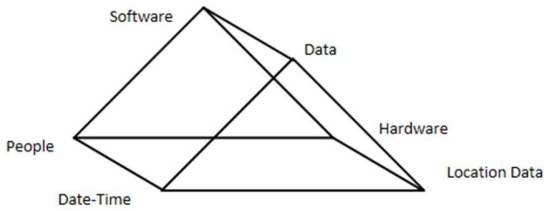

Figure. 1: 6 Factors Analysis Method Items Framework

2.1 Software Analysis

Software is the soul by which we use to manage, control and monitoring performance of the hardware. It is used to solve the complex calculations and processes the data to extract valuable information to facilitate our future.

What we are discussing here is how the software should be analyzed and provide information about the software and not only used in the analysis, and usually we get this information as a result of questions that will be answered and contribute to the measurement of the amount of the software validity to work.

2.2 Software as a Tool

Any Application-based service is using a software, as long as this application is used software will be involved in the process. To clarify this let's assume that you need to book a ticket for a travel from London to Paris. The application that enable you to book it online is a software involved in the process, the application that enable the Airline Employee to trace your ticket and process it is a software, and so on… there are also application that we use to collect, store and analyze the data to give us insight about the traffic which we further use to make of decisions. So the question here: What is the software we use book a ticket online?

2.3 Software as Analysis Item

When we discuss software as a tool, we are not concerning about software we use to book a ticket, to pay online or to receive emails, our concern is about the software we use to analyse software that is mentioned above, software that is used by analysts, managers and decision makers. Here's the difference between both of them, To clarify this let's assume a company will make a decision that allow people to buy a product only online, so what we focus about here is not the software users will use to buy products, but the software that analysts are using to gather, store, process, and retrieve information as reports to give to managers. So the question here: What is the software we use to analyse?

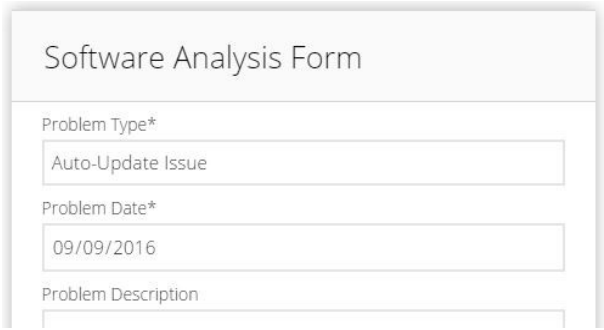

Figure. 2: Framework supporting application: Software Analysis Form

2.4 Hardware Analysis

Hardware consists of everything in the physical layer of the information system. For example, hardware can include servers, workstations, networks, telecommunications equipment, fiber-optic cables, mobile devices, scanners, digital capture devices, and other technology-based infrastructure. As new technologies emerge, manufacturers race to market the innovations and reap the rewards [3]. It is the body of the system, which includes the collection of physical elements that are linked together made up the main base of the system. Hardware analysis which includes performance measurement, processing speed and mobility capabilities produces a vital information that helps in entire system stability. However, hardware issues don't involve directly in the analytical considerations.

2.5 Hardware as a Physical Layer

Starting from its definition, The Hardware is the base that software is using to be run. We use this term to describe the tangible materials that we use to control, manage and process instructions of programs. To clarify this let's assume that people can only buy a product online, machines will be used to order this product either it is a PC or smartphone, time of servers to respond requests, number of servers in the network and number of requests could be handled per second, and so on... So the question here: What tools will be used by whom the decision will affect?

2.6 Hardware as Analysis Item

On the other hand, The Hardware consists of very important information that should be included into analysis stage about components used to analyze the applications, servers, networks and telecommunications used. By Analyzing, we get information about the environment of gathering and processing data. To clarify this let's assume a company will make a decision that allow people to buy a product only online, so what we focus about here is information about the performance of machines that will be used to gather, store, process and retrieve data rather than information about hardware will be used by people to order this product. So the question here: What I should use to make my decision?

Figure. 3: Framework supporting application: Hardware Analysis Form

3. People and Data Analysis

Stakeholders, Managers, Analysts and operations users are example of people of various parts of the organization that are involved into the information system, those people are making decisions either uncertainty or regular basis decisions. Involving teams in decision making improves the quality of decisions most of the times [6], being efficient for the organization to generate and evaluate different alternatives of problems solving [7]. Sometimes the democratic decisions are not able to be made because of minority domination or time pressure [8].

The core here is to analyze people who make decisions and apply those decisions.

3.1 People as a System Component

There is no doubt that the people is one of the most important pillars of any information system, if not the most important which be relied on to deal with the unexpected and instantaneous changes, and to manage information systems to facilitate our life. People in traditional analysis cycle are the key that analyze, and make decisions, so who control the system, give orders, store and retrieve data and manage information is one of people who are an information system component. So the question here: Who are the people who book a ticket for us, check the tickets, and so on...?

3.2 People as Analysis Item

On the other hand, if we will focus on people as an analysis item that will highlight the required characteristics of anyone who is doing simple task that affect the decision making process. To clarify this let's assume a company will make a decision if they will be able to sell kind of vehicles across a new country, so rather than concern about who will buy them, we will focus on who gathering data, who analyze it. Certifications, qualifications and training he had before making this task either it is a gathering data, analyzing it or making the decisions.

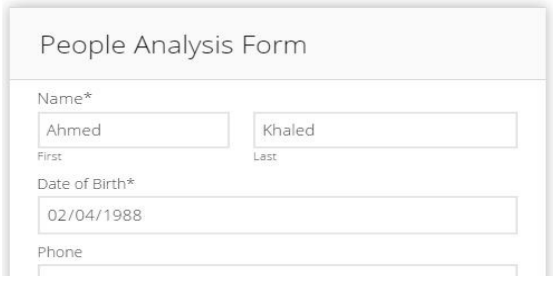

Figure. 4: Framework supporting application: People Analysis Form

So the question here:Who are the people gathering data, analyzing it, reporting information and who also are making the decisions?

3.3 Data Analysis

Data is the raw material that an information system transforms into useful information. An information system can store data in various locations, called tables. By linking the tables, the system can extract specific information. Today, a big data is what we are dealing with and According to [9], Big Data should be defined at any point in time as data whose size forces us to look beyond the tried and true methods that are prevalent at that time, whereas for [10] Big Data refers to enormous amounts of unstructured data produced by high-performance applications falling in a wide and heterogeneous family of application scenarios.

Data Analysis is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense and recap, and evaluate data, but the concentration will be on the analysis of data of the cumulative decisions that are made in the past. We will analyze similar problems of the past in addition to the analysis of solutions that have been put forward at that time. Not only this, but also analyze the way that has been followed to determine the appropriate solution and also analysis of the solution chosen, then analysis of the applicability of this solution if the same problem emerged of the present or the future. Will it be the appropriate solution to be applied? Or that there will be a need to change the method of selecting the best solution and then change the solution.

3.4 Data as Raw Values

Set of raw values are gathered together from different ways and by different tools, data is what we can be called. We cannot make a decision without data although the data might not help directly before processing it, but no data means nothing to be processed and no information will be available to make a decision. To clarify what we mean by data as raw values let's assume that a bank need to classify the most values to be withdrawn, to put them to its ATMs to facility and accelerate the client process, so for each client a report will include the amount of money, number of transactions. So they can determine values should be programmed like 100 $, 500 $ and 1000 $ instead of 100 $, 200 $ and 300 $. The question here: what is the data gathered from resources?

3.5 Data as Analysis Item

Our vision of things are different when you have a different vision perspective; as well as data. What we mean here is the data extraction, in addition to the search for data that we collect and analyze it, we should collect and analyze data on the sources of data and resources that collect data. To clarify that let's use the same prior example, a bank need to classify the most values to be withdrawn, to put them to its ATMs to facility and accelerate the client process. So we are looking for data about ATMs itself, how many transactions succeeded, failed or banned and amount of money per each transaction and what the percentage of amount of money withdrawn for the total amount. The question here: What is the data provided about resources?

Figure. 5: Framework supporting application: Data Analysis Form

4. Date-Time and Location Data Analysis

As all types of data, Time-based data is vital to decision maker as some decision could be valid for 1 days, 1 year, 100 year … and those kind of data will be analyzed. To clarify this let's assume that a company need to sell a product so the time of advertisements in Paris will be different than in Dubai, simply how long buyers can see the advertisement, will they be at home, in streets, at work, summer or winter and so on… so the goal here is to include Date-Time data inside the analysis cycle. The question here: When will this decision be happened?

4.1 Date-Time as Analysis Item

The difference here is that Date-Time data will not concern about the Time of decision, instead it will be concern about when the analysis will be occurred the day while analysis will be processed. To clarify this let's assume that a company need to sell a product in Paris so what I concern about here when are the decision makers will make their decisions, 10th Feb, 1st May, 30th Dec and so on … so the goal here is to include the time when the analysis is occurred. The question here: when analysis should be processed?

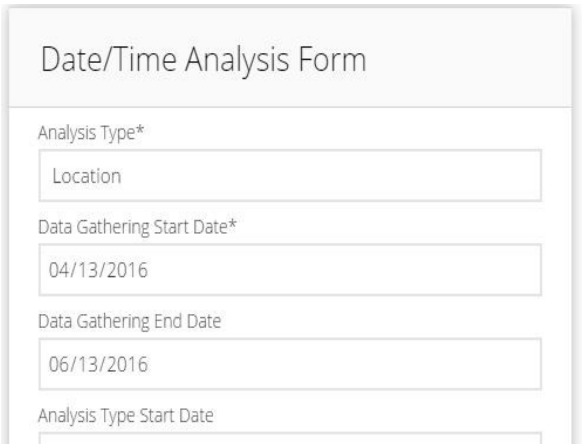

Figure. 6: Framework supporting application: Date-Time Analysis Form

4.2 Location Data Analysis

As all types of data, location-based data is vital to decision maker as some decision could be based on specific country, city or distract and those kind of data will be analyzed. To clarify this let's assume that a company need to sell a product so the advertisements in Paris will be different than in Dubai, the language, style, media used [TV, Streets…], and so on… so the goal here is to include market or location data inside the analysis cycle. The question here: Where will this decision be happened?

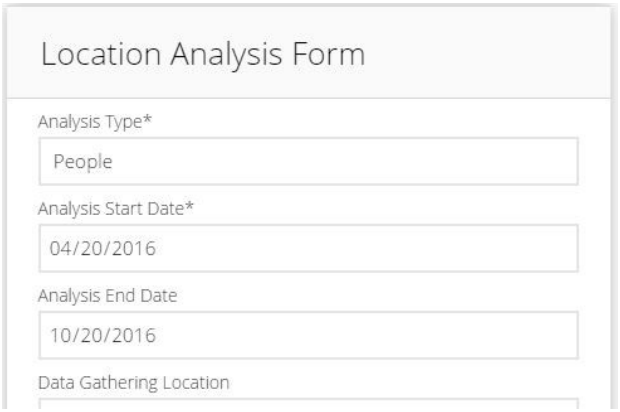

Figure. 7: Framework supporting application: Location Analysis Form

4.3 Location as Analysis Item

The difference here is that location will not concern about the location of decision, instead it will be concern about where the analysis will be occurred the surrounding environment while analysis will be. To clarify this let's assume that a company need to sell a product in Paris so what I concern about here where are the decision makers while they making decisions, California, London, Moscow and so on … so the goal here is to include the location where the analysis is occurred. The question here: Where analysis should be processed?

5. A Framework of Application

The proposed framework is meant for designing and developing applications supporting strategic business analytics based on many methods determined by decision maker, it might be a fixed number, random number or using of dynamic fuzzy logic [11].

Steps to run application:

(1) Decision maker will set minimum and maximum value for each factor by default minimum is equal to 0 and maximum is equal to 100.
(2) According to method used, application will determine factor total accuracy.
(3) Application will calculate the decision impact accuracy of all six factors.
(4) Total accuracy risk will formulate "Decision Accuracy Result" chart, providing the decision maker with graph describe the total accuracy of analysis and the risk of making a decision based on gathered and analyzed information.
(5) Accuracy of each factor will be formulated by the equation of Total Factor Accuracy (TFA) divided by the number of rows (FR) have been inserted against this factor. **Accuracy of Factor = (TFA / FR) / 100.**
(6) The class diagram for the base data model, which should be extended to include data for the particular application being developed with the framework (see Fig. 8)
(7) The accuracy result chart is formulate based on the input data provided by the used methods (see Fig. 11).

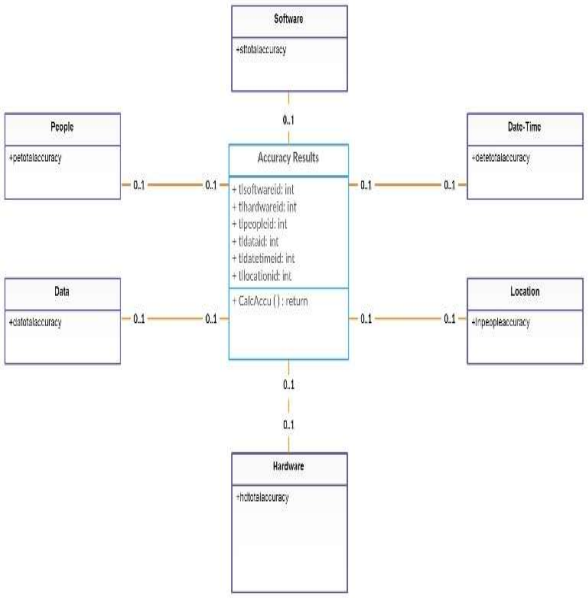

Figure. 8: Framework supporting application: class diagram

Table 1: Framework supporting application, data table

Factor	Rows	Factor Accuracy (FA)	Avg. Factor Accuracy
Software	1	20	(20/1) = 20
	2	10	(30/2) = 15
Factor Accuracy			**15 %**
Hardware	1	30	(30/1) = 30
	2	30	(60/2) = 30
	3	30	(90/3) = 30
Factor Accuracy			**30 %**
People	1	60	(60/1) = 60
	2	90	(150/2) = 75
Factor Accuracy			**75 %**
Data	1	5	(5/1) = 5
Factor Accuracy			**5 %**
Date-Time	1	0	0
Factor Accuracy			**0 %**
Location	1	100	(100/1) = 100
Factor Accuracy			**100 %**
Total Impact Results			**225**

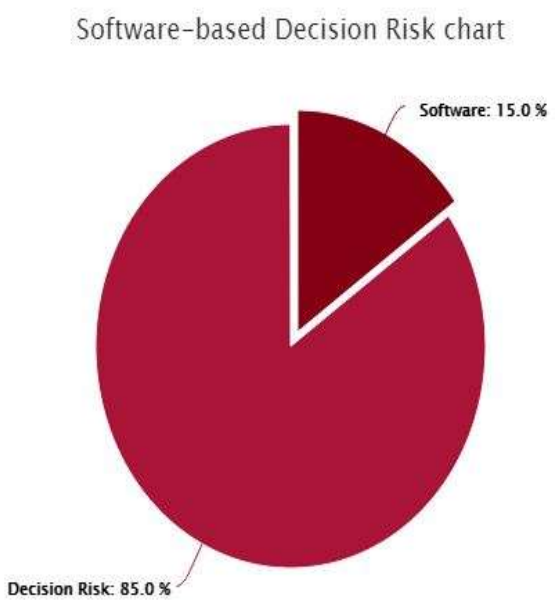

Figure. 9: Framework supporting application: Software Analysis chart

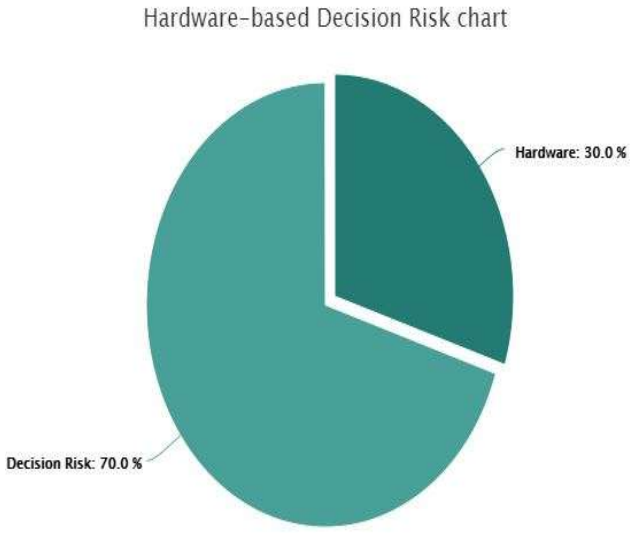

Figure. 10: Framework supporting application: Hardware Analysis chart

6. For any item, Total item impact will be Total Accuracy of Avg. Factor Result / Total Impact Results.

7.

For Software, Total Accuracy of Avg. Total Result = 15 / Total Impact Results=225=.06666.

So the percentage of impact will be .06666 * 100 = 6.7 %

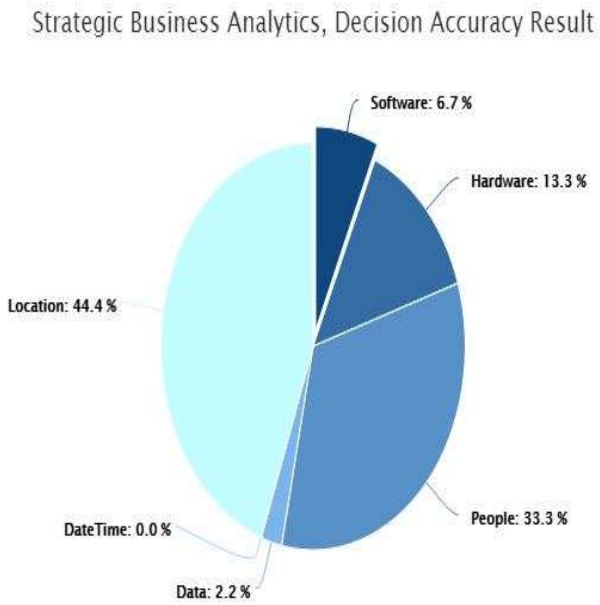

Figure. 11: Framework supporting application: items Impact chart

8. Conclusion

Current decision making process is focusing on gathered and analyzed data, without considering the information team, analysis team or applications used to do that. In this work, we propose a new and different perspective to make a better decision, we propose to go one step further by taking advantage of not only the traditional perspective of gathering and analyzing information but also enhanced level of information about software, hardware, data and people that are traditionally used in decision making process as well. Although this method may cause in a huge amount of information about things that decisions will be made for, and information about everything will be used to gather and analyze information to decision makers, but they can determine the reliability of information as well as the risk of making this decision based on the given information.

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