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OKAN ÜNİVERSİTESİ

INSTITUTE OF SOCIAL SCIENCES

ANALYTIC COMPETITION

Mehmet Noyan AYDIN

THESIS

FOR THE DEGREE OF

MASTER OF BUSINESS ADMINISTRATION

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ABSTRACT

ANALYTIC COMPETITION

When competitive powers of countries and organizations were mentioned in the past, concepts like wealth of natural resource, abundance of energy were used. Most points like afore mentioned concepts which could be considered as advantage of competitiveness in the past, today have lost significance. Information has become the petrol of this century that we are living through. Consequently the organizations and the nations which can refine this petrol using statistical and quantitative methods, will differentiate themselves from the others and will steal a march on the competition.

In the first two chapters of the thesis, what analytical competitiveness is, how it can be used, the advantages taken from its application, common characteristics of the analytical competitive companies and analytical competitiveness stages have been examined. Explaining the evaluation system that is needed by the companies which stay the course of becoming analytical competitors in order to evaluate on which stage they are, the skills that have to be possessed for each stage are mentioned.

In the third chapter of the thesis, under Analytical Delta factors it has been conducted regarding to how the data should be prepared for the organizations, which kind of data will provide the company the advantage for competition, what is meant with qualitative data, what kind of a leadership is needed by the organization in becoming an analytical competitor and common characteristics of analytical leaders, how the goals for becoming distinct in competition will be determined, from which sources the analysts that are the human resources needed by the company in this respect, can be obtained and how they can be retained.

In the fourth chapter exemplifying the skills which are obligatory to become an analytical competitor and corroborating with applications, it has been tried to set a course for the

establishments which will follow this path. And in the last part thesis has been ended by sharing the predictions related to the future of analytical competitiveness.

Keywords: Analytical, data, competitiveness, organizations.
Date: June, 2014

ÖZET

ANALYTIC COMPETITION

Geçmişte ülkelerin ve organizasyonların rekabet gücünden bahsedilirken ölçek ekonomisi, doğal kaynak zenginliği, enerji bolluğu gibi kavramlar kullanılırdı. Eskiden rekabet avantajı olarak gösterilebilecek üstte saydıklarımız gibi pek çok husus bugün önemini yitirmiş durumdadır. İçinde bulunduğumuz bu yüzyılın petrolü bilgi olmuştur. Dolayısıyla istatistiki ve nicel metotları kullanarak bu petrolü işleyebilen organizasyonlar ve uluslar kendilerini diğerlerinden farklılaştıracak ve rekabette bir adım öne geçecektir.

Tezin ilk iki bölümünde genel olarak analitik rekabetin ne olduğu, ne şekilde kullanılabileceği, kullanımının bize sağlayacağı avantajlar, analitik rekabetçi firmaların ortak özellikleri ve analitik rekabet basamakları incelenmiş. Analitik rekabetçi olma yolunda ilerleyen firmaların hangi aşamada olduklarını ölçebilmeleri için ihtiyaç duydukları değerlendirme sistemi açıklanarak her bir basamakta sahip olunması gereken yeteneklerden bahsedilmiştir. Tezin üçüncü bölümünde Analitik Delta faktörleri altında organizasyonlara datanın ne şekilde hazırlanması gerektiği, hangi tip dataların firmaya rekabet avantajı sağlayacağı, kaliteli data denilince neyin kast edildiği, organizasyonun analitik rekabetçi olmaya giden yolda nasıl bir liderliğe ihtiyaç duyduğu ve analitik liderlerin ortak özellikleri, rekabette farklılaşma için hedeflerin nasıl belirleneceği ve organizasyonların bu yolda ihtiyaç duyduğu insan kaynağı olan analistleri hangi kaynaklardan elde edebileceği ve nasıl elde tutacağına ilişkin yol gösterilmiş. Dördüncü bölümde Analitik rekabetçi firma olmak için gereken yetenekler örneklendirilerek ve uygulamalarla desteklenerek bu yolu izleyecek kurumlar için bir yol haritası oluşturulmaya çalışılmıştır. Son kısımda da analitik rekabetin geleceğine ilişkin ön görüler paylaşılarak tez bitirilmiştir.

Keywords: Analitik, data, rekabet, organizasyonlar.

Date: Haziran, 2014

LIST OF ABREVATIONS

BI : Business Intelligence

BICC : Business Intelligence and Competency Center

CEO : Chief Executive Officer

CIO : Chief Information Officer

CoE : Center of Excellence

CRM : Customer Relationship Management

EDI : Electronic Data Interchange

EDW : Enterprise Data warehouse

ERP : Enterprise Resource Planning

GPA : Grade Point Average

HR : Human Resource

IM : Information Management

IT : Information Technology

MBA : Master of Business Administration

MDM : Master Data Management

MPP : Massive Parallel Processing

OLAP : Online Analytical Processing System

OLTP : Online Transaction Processing

Pilab : People&Innovation Lab

POS : Point of Sales

ROI : Return of Investment

SQL : Structured Query Language

SMP : Symmetric Multiprocessing

TCO : Total Cost of Ownership

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ACCESS

Netflix has made a billion dollar business out of nothing in a period shorter than 10 years using analytics in order to create an algorithm which will predict customers' film choices ideally and to optimize the whole business processes and has buried Blockbuster which has 3 billion dollar annual profit and branches more than 3600 around America, in dusty pages of history. Instead of opening mega clubs just like its competitors Harrah's entertainment has developed its strategy based on customers' loyalty and satisfaction using analytics in order to analyze many variables such as customers' demographics, game playing frequencies and habits. And Global concrete Monster, Cemex has become distinct in the subject of supplying ready-mixed concrete in shortest periods using analytics in order to optimize supply-chain and this has given the company big advantage in pricing in comparison with its customers. American soccer team New England Patriots has succeeded using analytics in order to choose the most correct players.

The common characteristic of the above mentioned industry leading companies is that they put analytics in the center of the company's strategy. Alright then what is analytics? Analytics is to direct organization's steps and decisions using findings obtained from data analysis by statistical and quantitative methods, management mentality based upon the truths and explanatory and anticipatory models.

To enable the use of analytics which is a subset of business intelligence and is defined as the methodologies used to understand and measure data and performance, the organization needs the hardware which has the capacity to carry out these processes, software packages that will carry out necessary analysis, and data processing skills which will help conditioning and combining the data coming from different sources. However, it is not only hardware, software and data processing skills differentiating the companies but human factor also makes difference. Smart analyzers who will explain the meaning of the findings obtained from analysts, employees who will perform suggestions and the managers who will make decisions according to acquired findings.

When all of the above mentioned come together, they provide to the company long-term sustainable competitive advantage. Moreover, most of the competitive elements existing before have lost validity nowadays. For instance, companies from varying sectors offer similar products and services and for this reason it has been becoming more and more difficult to differentiate our products. Think about similar smart phones, tens of brands have been contesting for market share. Similarly again companies manufacture these products using identical technologies, we all know that same processors, graphics processing units and similar operating systems exist in almost all of these phones. Apart from these, geographic location which can be considered as an important competitive element for the past has lost significance in present-day data and audio networks and the world which becomes smoother day by day. It also has reduced the importance of location in global competitiveness. For example, for production lots of companies have headed towards the countries where labor force is cheap. Pre-existing monopolies have mostly been imbedded in history due to treaties of commerce and newly developed technologies are rapidly duplicated by the competitors. For this reason to manage our business in the most effective and fruitful way seems like the last competitive element remains in our hands, analytics.

Moreover, the studies of the institutes like Accenture and specialists like Thomas Davenport and Jeanne G. Harris shows us that the industry leading companies use analytical methodology more sophisticatedly and prevalently in comparison with the others in their sectors. In addition to this, whereas retailers such as Tesco and Albert Heijn use analytics for customer loyalty programs and providing customers maximum availability keeping inventory amount at minimum level, Google use it to choose the most correct candidate and Marriott International use it in order to determine room prices in the most correct way. Analytics is the key of high performance business processes that can be used to enhance almost all of the business processes.

In addition to this, whereas some industries (finance, retail, transportation companies) are more susceptible for analytical competitiveness due their data producing structures, other may have the need of more extensive work because of their structures based on tastes and human affairs. But in time, you can expect the use of analytics to find a place in the industries which are

assumed as impossible to perform analytics. Some of those are wine producer E. & J. Gallo and Styleseek in business of fashion which are cited throughout the thesis. As a result whereas analytics is not a strategy single handedly, to use analytics to improve performance and efficiency in competitive business processes constitutes competitive strategy.

In this context, throughout the thesis the skills necessary for being an analytical competitor organization have been listed and instantiated and it has been tried to determine a road map for the companies that want to become analytical competitors. While in the first part of the thesis what analytics is, history of analytics and the advantages of being analytical for the company have been touched upon, in the second part four characteristics shared by the companies which are the most sophisticated and successful companies in their own sectors have been referred and the levels of analytical competitiveness that can be used with the aim of measuring on which stage analytical competitive companies are, have been narrated. In the third part, examining individually pieces of the puzzle which is bound for being an analytical competitive company and comprises of data which we call analytical delta, enterprise, leadership, target and analysts, what has to be done in each subject to increase the analytical capacities of the organizations has been detailed and instantiated. In the fourth part, analytical applications have been given a seat and applications related to web data and human resource analytics which are among extensive usage areas of analytics, have been detailed. In the last and fifth part, predictions have been made related to the difficulties and opportunities that may be encountered by analytical competitive companies in the future.

1. CHAPTER – A CLOSER LOOK TO ANALYTICS

1.1. ANALYTICS

Once a decade business world finds a new and attractive term to describe how it contributes to management and decision making processes by analyzing possessed data. Whereas in 70's this label was decision making support system and emphasizing the effect of data in decision making, in 80's it took the name manager informing systems and emphasized that the managers had made decisions according to the results obtained by these data. In late 80's it had begun to skid into more technical terms and took the name OLAP (online analytical processing system). Today it has been observed that concept of business intelligence has become widespread and started to rise. Whereas business intelligence includes data access, reporting and analytics, analytics which is a subset of business intelligence, give answers to questions which are generally more valuable and require more initiative. Throughout the thesis when I say analytics I will be mentioning the explanatory and anticipation providing models obtained by data analysis with statistical and quantitative methods and management mentality[1] based on measurable facts occurring by the usage of these models.

We also should not forget that, high analytical skills require specializing in data management. Information is only valuable when it is combined correctly and made available. In brief analytical methods reckon upon data management skills of our organization.

If we want to make better and more correct decisions and do acts serving for the benefits of our company in the direction of these decisions, we should integrate analytics to business transaction and use analytics in order to enhance performance upon key functions which we consider as necessary for the operation of our business. As well as using analytics to generate fully automated decision making mechanisms, we can use it as an

[1] Thomas H. Davenport, International Institute for Analytics, (2012), Enterprise Analytics: Optimize Performance, Process, and Decisions through Big Data, FT Press, New Jersey, USA, p.9.

input which makes decision making easier. The statement "The unexamined life isn't worth living" of Socrates can be adopted as "The unexamined decision isn't worth making" [2] in the world of present day analytical competitiveness which is reliant to mathematical analysis.

In the graph below, we can see the skills related to business intelligence and after which point its subdomain analytics starts and at what rate it gives advantage to the company.

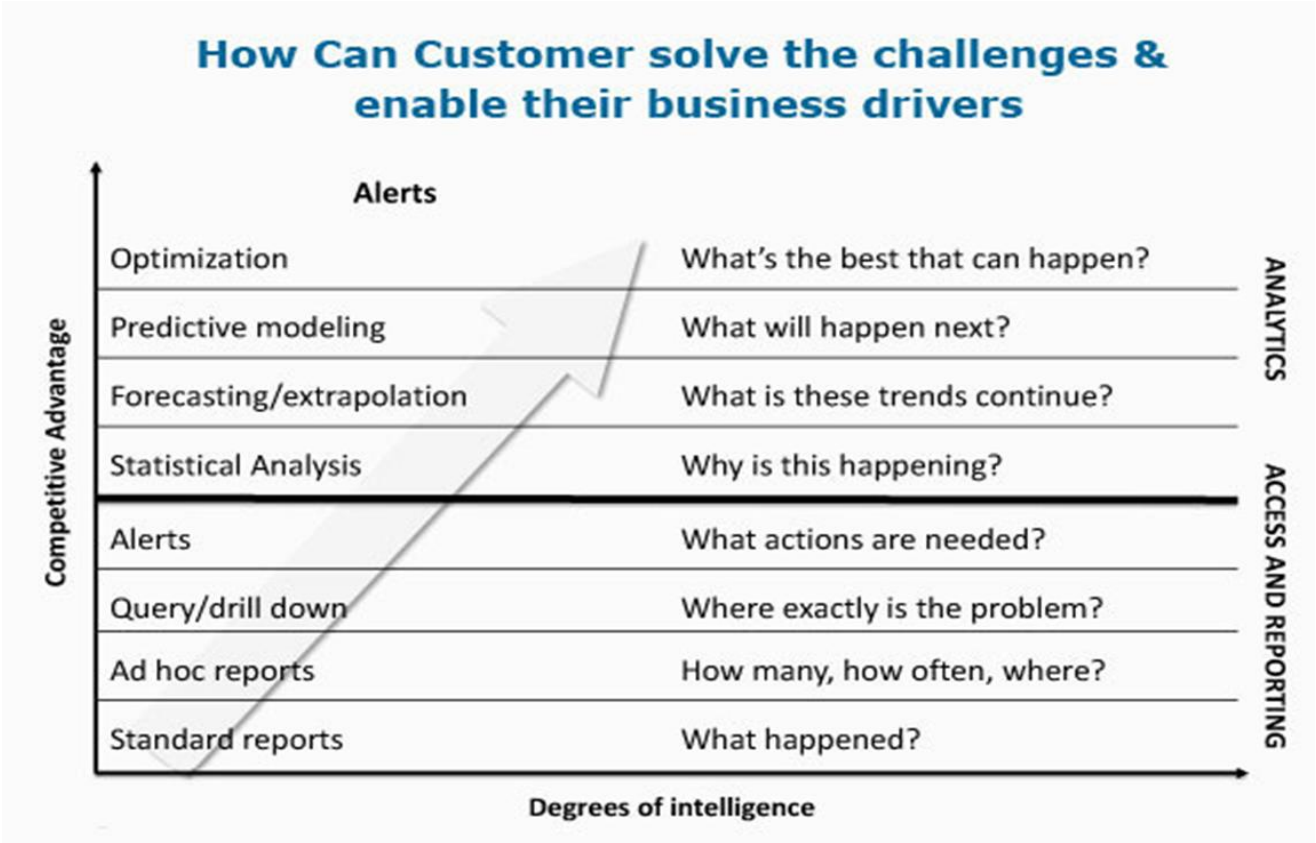


Figure 1.1. Degrees of BI and competitive advantage

Source: Thomas H. Davenport, Jeanne G. Harris; "Competing on Analytics", Harvard Business Press, 2007, s.8

[2] Thomas H. Davenport, Jeanne G. Harris, Robert Morison, (2010), Analytics at Work: Smarter Decisions, Better Results, Harvard Business School Press, Boston, USA, p.2.

1.2. HISTORY OF ANALYTICS

In today's world of analytics, companies are trying to give better service to their customers by analyzing and classifying the incredible amount of data obtained by enterprise resource planning (ERP), point- of – sales (POS), web sites, and other sources and to catch competitive advantage by giving services with the higher added values. At the same time managers are seeking for new funds to differentiate and develop their products and they are searching for new and different ways to use computer systems in management. Business intelligence softwares can make more complex analysis than the usual and the hardware producers offer more rapid and optimized solutions than usual to manage data in big amounts.

However, first use of computer systems in decision making support systems has become possible with putting IBM mainframe 360 and other mainframe computer systems in use with appropriate price and performance in 1965 and at first they have been used in recurring businesses and limited business lines which require usage of intense data like production and document management. According to Peter Keen and Charles Stabell who are among pioneers in decision making support systems, origins of this system hinge upon theoretical studies[3] of decision making in organizations that were carried out in Carnigie Tech in late 1950's and interactive computer system studies[4] which were carried out in the early 1960s. and according to some others it has developed out of exigency coming out as a result of limited time for decision making and big data that has to be processed by centralized control in operations in 2nd World War when army's computer systems were not been developed in a sense as we know now[5].

Due to the fact that software packages produced by SAS Institution and SPSS made statistical analysis available for researchers and businessmen in 1970's, statistical analysis had gained popularity and Decision Making Support Systems had evolved to Administer

[3] Peter G. W. Keen, Michael S. Scott Morton, (1978), Decision Support Systems: An organizational Perspective, Addison-Wesley

[4] WEB_1, (2003), Power D.J. ,A Brief History of Decision Support Systems http://dssresources.com/history/dsshistoryv28.html, 1/1/2014

[5] Main Van Crevekl, (1985), Command in War II, Vad University Press, p 1-2

Support System. The aim of these systems is to enable senior executives to report and track the performance of the company but due to administrators who are relatively unfamiliar with technology, it had never found a complete extensive usage area.

Because of the fact that data used in Administer Support Systems is relatively small and used to provide answers for only some questions (performance report and performance tracking) they could not fulfill the needs of data processing which has increased in the recent past and have left their places to the data focused systems which we call OLAP.

As for today business intelligence term which contains data collecting from the lowest level of the company to the highest, data management, reporting, decision making and all of analytical techniques, has been used.

1.3. BENEFITS OF BEING ANALYTICAL

- Analytics is the compass of the administrator in his kitbag, it helps to find his directions in hard times and it is his master, administrator can predict the changes in economy and the market by making decisions based upon the truths with its support.
- It helps the administrator to understand what works or not in reality. Basis of analytics is "test and learn". By doing statistical modeling after testing, it provides to understand whether the success is random, or it has grown out of other factors, or else it is a success which has been obtained as a result of the decisions made. We can see how much our decisions have taken us to our goals.
- Leverage previous investments in IT and information to get more insights, faster execution, and more business value in many business processes.[6]
- Whereas lowering the costs it enhances the efficiency. While we see with optimization techniques how we can better perform a business like aforementioned and how we can create the highest value, with predictive models we can predict

[6]Thomas H. Davenport, Jeanne G. Harris, Robert Morison, (2010), Analytics at Work: Smarter Decisions, Better Results, Harvard Business School Press, Boston, USA, p.4

economical changes and contractions in the market. Thus it becomes possible to improve service and production quality while trimming the sails.

- Each company determines the risks related to elements such as production processes, market conditions, and taxes and in the case that these identified risks occur, the company makes evaluations related to the cost burden of the institution. Analytics provides us to define more efficient metrics, to carry out more precise risk assessment and as a result to perform more efficient risk management.
- The more we widen our sample set, the more precise result we obtain from our statistical model. Today in conjunction with obtaining skills that can process analytical capacities and huge amount of data, understanding the behavioral patterns of the customers has become easier together with larger sample sets and changes in the market have become more precisely predictable.
- Analytical systems providing us to make decisions using logic and data, enable us or forthcoming administrators and specialists working in the field of operational efficiency to understand the logic of business and to improve decision making system.

1.4. APPROPRIATENESS OF ANALYTICAL DECISIONS

In today's world of analytics in which the customers want quick response to their demands as soon as possible by interacting with the company at anytime and anywhere they wish, it is required that companies should make snap decisions and should aim at maximum profitability together with customer loyalty by differentiating their decisions for each of their customers. Maybe before, strategic plans and important decisions were made once a month, today they can be overnight or instant decisions in some cases.

Adjustment made on product price, product specifications, services offered together with product and many more decisions have been made and put into practice as soon as possible to keep competitive advantage. As Jay Forrester who is the first one to research the use of computers in decision making, indicated in his book Industrial Dynamics

"Management decisions based only on mental models are inferior to decisions derived from computer models that can represent complex relationships and predict outcomes that the human mind can't" [7]

Shortly, decisions based on facts obtained by the analysis of available data in accordance with the limitations, have been righter than the decisions made relying on emotions, predictions, and beliefs of the administrator. It is possible to make the most beneficial decisions for the company in many cases by using analytics approach as we mentioned above and using this approach in different departments is possible, too.

However, there are also the situations in which it is not possible to use analytics approach or analytics approach should not be applied. These can be listed as below:

1. When there is not enough time to make decision

Decision time of a policeman for deciding to shoot/not to shoot a suspect as indicated in the book Blink[8] of Malcom Gladwell or estimation time of firefighters to estimate when and which parts of a burning building would fall down indicated in the book Source of Power[9] of Gary Klein can be exemplified.

2. Never experienced before

If a case have not experienced before then to collect data about this case becomes harder. Indeed, in such cases by preparing little tests with the approach of "test and learn" which is the basis of analytics approach, we can learn whether our idea works or not. But it might not always be possible to test. For example, CEO of Amazon, Jeff Bezos was aware of that he was in the need of both a huge infrastructure investment and translating too many books but he trusted his instincts and this feature had gained popularity at short notice[10]. As well in an interview he gave to Wired he had indicated that this feature created a difference

[7]Jay Wright Forrester, (1961), Industrial Dynamics, Massachusetts Institute of Technology Press
[8]Malcolm Gladwell, (2007), Blink: The Power of Thinking Without Thinking, Little Brown, New York, America
[9]Garry Klein, (1999), Sources of Power : How People Make Decisions ,MIT Press, 1999
[10]Alan Deutschman, (2004), Inside the Mind of Jeff Bezos, Fast Company

of 9% among similar books in the sales[11]. Similarly again Mike Linton who is the chief marketing officer of BestBuy had mentioned in an interview[12] that they sold Paul McCartney CD's with concert tour discount. Because that this had never been tried before, they didn't have the opportunity to test and they had acted with instincts.

3. The past misleads

All of the mathematical analyses are based on some assumptions and cases such that we cannot predict the future by looking at the past, may occur. For these cases the name "black swan" [13] which is indicated in the book Fooled by Randomness published on 2001 and written by Nassim Nicholas Taleb, is used. For instance, rise of internet, Hitler, the September 11 attacks which could not been predicted even in science fictions are some of the examples. In such cases companies cannot use decision making algorithms which they had used before. For example in a country of which economy will collapse after the big expected Istanbul earthquake it will be a false step for the banks to give credit relying on credit score methods that they have used before.

4. Administrator is enormously experienced.

In some cases administrator's experience is sufficient to make decision swiftly analyzing the data he possesses. For example, when you put up your house for sale, the real estate agent on the corner that has been making real estate purchase and sales in Bakirkoy region for 20 years, will price out quickly and recommend a price at arm's length. Therapy sessions of therapist Dr. John Gottsman who Malcolm Gladwell mentioned in Blink, performed with countless couples for 40 years have effect on his right guesses regarding to whether the marriage continues or ends.

5. The cases that variables cannot be measured

[11] WEB_2, (2005), Chris Anderson, The Zen of Jeff Bezos, http://www.wired.com/wired/archive/13.01/bezos.html , 1/5/2014

[12] Thomas H. Davenport, Jeanne G. Harris, Robert Morison, (2010), Analytics at Work: Smarter Decisions, Better Results, Harvard Business School Press, Boston, USA, p.11

[13] WEB_3, Wikipedia contributors, Black Swan Theory, http://en.wikipedia.org/wiki/Black_swan_theory, 1/5/2014

Sometimes to make decision using analytical methods can be hard because inputs impressing decision making are multifarious and too many or not measurable. Mate selection is a good example. Although we have a human type and certain characteristics in mind we usually prefer to find the right person with our instincts, fashion can similarly be exemplified, it is hard to predict which color and style will be popular that season.

There exist analytics approach for many things that we consider as we cannot measure analytically. For example, there are eHarmony which helps to choose the best match according to test results and pembepanjur.com used in our country or the companies pursuing analytical approaches directed to a variable which cannot be measured such as taste and considered unexpected and independently of analytics. For example, in an industry such as wine in which it is hard to predict customers' choices and totally related to taste and instincts, today top wine producer E. & J. Gallo has been offering the best taste recipes[14] which he obtains as a result of chemical analyses by inspecting agriculture fields and customers' buying behaviors with analytical methods.

1.5. WHY ANALYTICAL COMPETITION?

When we today enter into a market it is possible to see hundreds of shampoos on cosmetics section, it is not different than this for many products. In today's world which a lot of companies compete using same technologies in more than one industry, to operate all departments of our company with highest-performance and to get the highest efficiency and benefit from the works done have seemed to be the last discriminating point remained.

Many cases that could be shown as an advantage of competition in the past, have lost importance or validity for today's global companies. For example, protective regulations have lost efficiency due to liberal policies and treaties made with trade associations such as European Union, there has been a few monopolies left and remained monopolies have been stuck in certain industries. Geographic advantages have been gradually loosing significance. Certified technologies are being copied quickly. When we look at to the recent past ongoing patent conflicts between Samsung and Apple have set

[14] David Darlington; The Chemistry of a 90+ Wine, Newyork Times Sunday Magazine, August 7, 2005

examples and to put signature to innovations and inventions which will result in a whole change of industry or at least shaking of it has become harder day by day. Under these circumstances, the only remaining weapon of the companies to gain competitive advantage is to run their business in a way to provide the highest benefit and efficiency and to obtain the highest profitability that they can get from business processes by making reasonable decisions.

Analytics approach can be used to support almost every business processes, but in order to be competitive organizations need to choose a subject which will differentiate their business and make it much better than the others and lead themselves to success. This chosen subject may be directed to their operating or decision making system.

For instance, as well as we can choose the most profitable and preferred customers by analyzing customer and consumer habits using analytics to enhance work performance, a company in finance sector can use it to find the customers who have the lowest risk of repayment and to minimize its risk. Moreover, it becomes possible with the effective use of analytics that the companies in service sector try to keep their customers that have the highest possibility to leave the service by providing them different offerings as a result of customers' feedback analyses and make customer focused pricing and product/service offerings examining customers' purchasing habits and frequencies.

Similarly again, it becomes possible to keep the inventory we have at the lowest level while providing the customers to find the products always on shelves by using analytics in supply chain.

In other hand, operational business processes of our company might not be much different than the other companies. It is still possible to choose the best location for our company's new branches to be opened and to analyze much better merger and acquisitions with the use of analytics in decision making systems.

Shortly analytical organizations are the companies which use the extensive data they have for statistical and quantitative analyses in order to gain competitive advantage and to be the best in one or more fields which they choose as business skills and make decisions

according to the data they obtain. Though analytics alone do not present a strategy, enhancing chosen skills by using analytical methodology absolutely constitutes competitive advantage for the company. Throughout this thesis we are going to check up on the companies that use analytical methodology at enterprise level such as Harrah's entertainment, Netflix, Capital One and try to understand how they get ahead in the competition.

2. CHAPTER – OUTLOOK ON ANALYTICS

2.1. COMMON CHARACTERISTICS OF ANALYTICAL COMPETITIVE COMPANIES

Analytical competitive companies are the companies which get competitive advantage by systematically applying analytical methodology to their decision making and business transaction systems as we mentioned before.

When we look through the companies which consider analytical competitiveness as a part of their corporate strategy, we can see that the companies which are the most sophisticated and successful companies in their own sectors share these four characteristics:

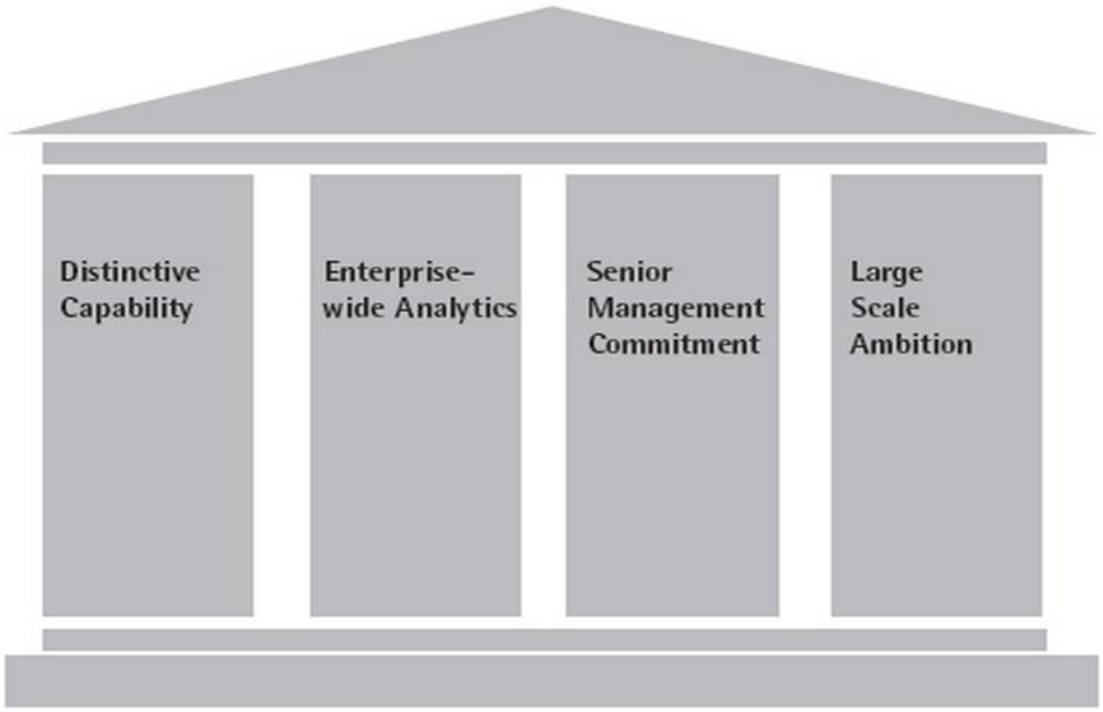


Figure 2.1. Analytical capability pyramid

Source:

http://www.accenture.com/SiteCollectionImages/Unexpired_Pull1/Research_and_Insights/analyticalcapability_la2.jpg

2.1.1. To support a strategic and distinctive property

Distinctive property means that the organization shows a different approach in at least one subject and differentiates from its competitors and succeeds in its business segment by using this property. Without this concentration analytics can not move beyond being a tool used in different departments and can not be considered as a strategic advantage.

Briefly, analytics should support one or more functions on which the company strategize for company to get competitive advantage. As well as changing in accordance with industry and organization these functions can vary as supply chain, customer loyalty, pricing and income management, customer services and human resources.

For example, Netflix operating in online media streaming industry, has build up its strategy on predicting the best customers' tastes of movies, offering movies in accordance with users' tastes[15] and delivering DVDs ordered by supply chain in the fastest way in regard to customers' advantageousness. Harrah's entertainment describes its strategy as enhancing customer loyalty and giving customers the best service instead of opening mega clubs like its competitors. Today Total Rewards program which is offered by Harrah's entertainment to its customers, has been considered to be the best among customer loyalty programs in entertainment industry and were granted The Master of Enterprise Loyalty Award by Colloquy[16]. On the other hand Marriott International has built up its strategy on enhancing product availability by predicting customers' behaviors at micro-market level and increasing the incomes by maximizing the prices, in short has built it up on income management.[17] Whereas the field on which Wal-Mart concentrates is supply chain, in

[15] WEB_4, (2013), Tom Vanderbilt, The Science Behind the Netflix Algorithms That Decide What You'll Watch Next, http://www.wired.com/2013/08/qq_netflix-algorithm , 1/6/2014

[16] WEB_5,(2013),Colloquy magazine, The Winner: Caesars Entertainment, http://www.colloquy.com/article_view.asp?xd=10745 , 1/6/2014

[17] Cross, R., (1997) , Revenue Management: Hard-Core Tactics for Market Domination., New York, NY: Broadway Books

industries such as professional sports teams and software companies in which human is the most important value to concentrate on human resources analytics can create difference.

Of course not every company has a distinctive property of its own. For example, it is hard to understand at first sight for an outsider looking in what kind of a differentiating policy X brand car of ABC Holding that made the decision to pull out of European market until 2015 (company name and car brand are not given due to ethical reasons) follows and what it does better. And it is not possible to be considered as analytical competitors for the companies which can not succeed to be differentiated obviously from its competitors in any case.

Apart from that, it may not be possible to apply analytics directly to the main field in which some business lines want to become distinct. For instance, we can exemplify some sectors such as fashion industry which depends on tastes, and it is not possible to predict what is going to be in fashion each year or such as executive search industry in which not only skills but also human relations are important in choosing and the decisions made are mostly intuitional and predicated on experiences and the facts obtained as a result of numeric data analysis do not have a tangible meaning and recommendations such as management consulting are based on the experiences owned. However there is still analytical potential even in these industries. For instance, Tyler Spalding, graduated from MIT Sloan School of Management, had seen fashion industry as a basic data problem and thinking that analytics could be applied to style choosing he had built Styleseek website. Styleseek is basically a website for advice which was formed intending to help the people who are interested in fashion in choosing right cloth in right time by using the data and the algorithm which they continuously develop. Tyler had narrated what Styleseek exactly does as below in the interview he had with MIT editor Renee Boucher Ferguson:

We’re a new kind of e-commerce personalization platform. Ninety-nine percent of existing e-commerce recommendations are done very inefficiently on a variety of levels. They generally take really, really big data sets and extract patterns and match keywords. What we’ve created is analogous to a Pandora-like system. Each product is mapped by human style experts across a variety of universal characteristics. So we can literally

compare a T-shirt and a couch and actually understand the differences in style and what each person likes.[18]

As you can see even in farthest industries to analytics potentials of analytics have been discovered day by day and analytically competitive companies have been transforming their industries in time. As a natural consequence, companies has been studying on new measuring systems and metrics directed to the business lines in which they compete. For example, institutions operating in finance industry to estimate credibility have been using FICO score which is based on an algorithm developed by Fair Isaac Corporation in 1989. Main inputs of this algorithm can be summarized as customer's payment history, current amount in dept, credit history duration, types of the credits used and the amount of new loan to be taken.

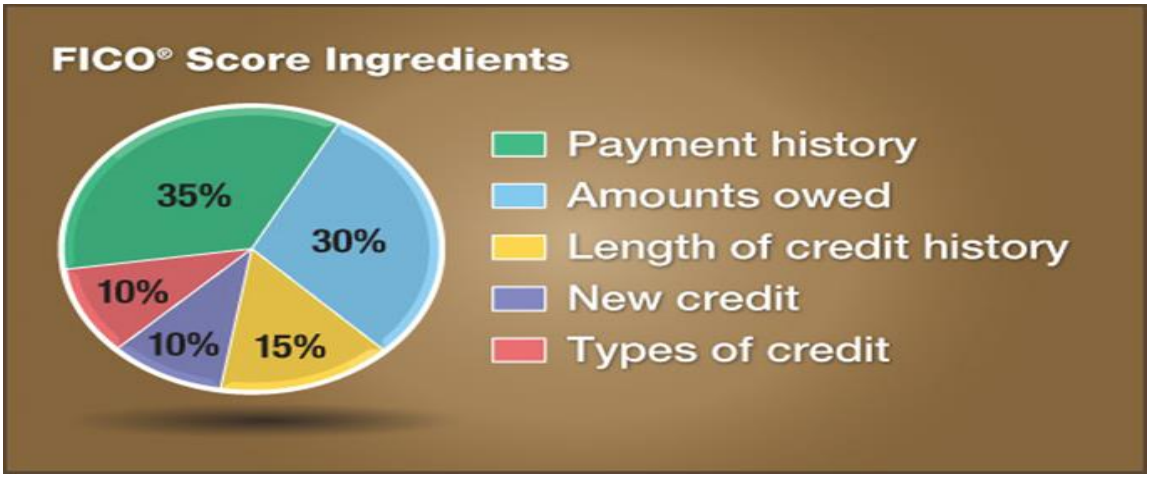


Figure 2.2. FICO score elements

Source: http://www.scoreinfo.org/

Customers of FICO score that varies between 300 and 850 and finds area of use by finance industry, have many objections and think that it is not fair enough. Because of the

[18] WEB_6, (2013), Renee Boucher Ferguson, How Analytics is Giving Fashion a Makeover, http://sloanreview.mit.edu/article/how-analytics-is-giving-fashion-a-makeover , 6/29/2014

fact that it evaluates all financial movements in the last 7 years equally and this makes it impossible for the people who bankrupted or had financial difficulty in the past to get bank load or at least to get it with reasonable bank rates customers complain besides some financial institutions which are monopolies in the sector feel uncomfortable with the system and they think that it does not precisely reflect the reality. As a result of this with the cooperation of TransUnion, Esperia and Equifax VantageScore[19] has been founded as a competitor of FICO and its model that predicates on 6 metric together with the fact that it bases on financial movements of the customers in the last 24 months, have been kindly by its customers.

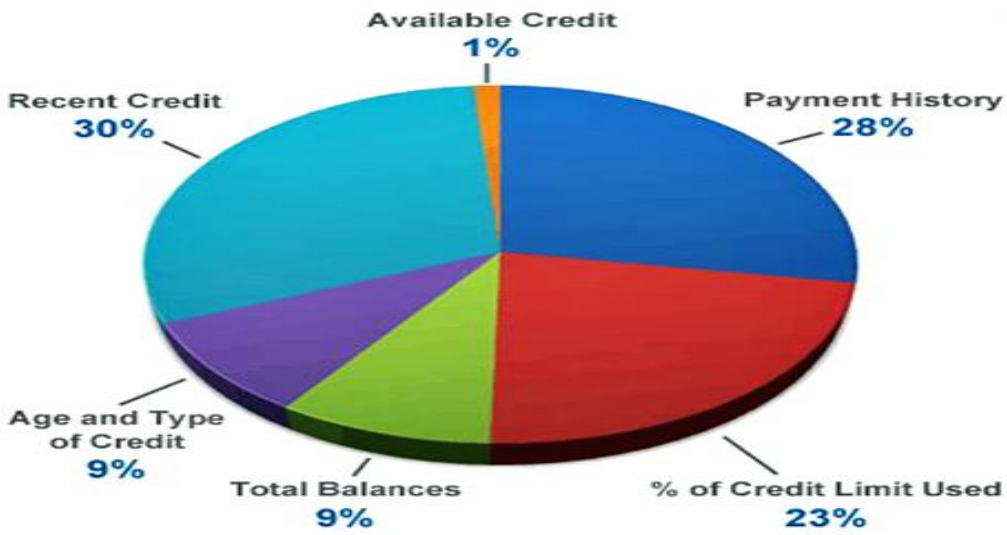


Figure 2.3. Vantage score elements

Source: https://www.lexingtonlaw.com/blog/credit-score/vantagescore.html

In addition to analytics methodology based on the use of new metrics such as above mentioned VantageScore and reinterpretation of existing metrics, it is a frequently

[19] WEB_7, Vantage Score, http://www.vantagescore.com/, 3/12/2014

encountered case that existing metrics find new areas of use for themselves in other industries. For example, Progressive which operates in insurance business had found that FICO scores are not only related with whether customers make payments or not but it is related also with the probability of making a car crash for customers. For this reason it has seen no harm to offer low insurance amounts to the customers whose FICO scores are low. Moreover this approach has been gaining acceptance by almost all of car insurance companies. Clarence Smith who has been working as a former assistant vice-president in Conning&Co that has been serving to insurance companies in the subject of wealth management, says "A consumer with bad credit is going to pay 20 to 50 percent more in auto insurance premiums than a person who has good credit"[20]. In addition to these it is thought that credits scores will be used by health insurance companies and it will be possible to take out a health policy for the customers with high credit scores without the necessity of high cost physical examinations. [21]

Shortly, analytical competitive companies choose a field of first priority and use it for competition. After a company once adopts analytics approach and starts to use test and learn approach, to stop the spread of analytics approach in other fields becomes impossible. For example, while prior competitive field of Harrah's entertainment which operates in entertainment sector was customer loyalty, in the course of time it started use analytics for pricing and determining the placement of slot machines in casinos.

2.1.2. Enterprise – wide Analytics

In the past analytics approach of the companies was usually personal or at the level of department, the most important reason for this to continue as the same in many companies is that the departments which use intensely or concentrate quantitative values such as quality, marketing and pricing, have adopted the analytics approach in development processes of the companies in time. In such cases analytics usually stays in spreadsheets in computers of the users. Even it is a good thing for analytics to be used personally by the

[20]WEB_8, Christopher Cruise, How credit scores affect insurance rates, http://www.bankrate.com/brm/news/insurance/credit-scores1.asp, 1/10/2014

[21]WEB_9, Freescore.com, Who want to know your credit score?, http://www.freescore.com/your-credit-score.aspx, 1/10/2014

workers in order to analyze and make decision, because that the probability of including data errors for these documents is high and there is the probability of creating more than one truth in the company, it mostly doesn't seem possible to be used by the companies which try to find only one truth in order to generate an analytical approach that appeals to whole company.

Analytical competitive companies and organizations can not bank on analytical activities made by only one certain group or activities of departments which are dispersed in the company. To process data in way that information supports critical and competitive functions, information should help to gain insight into the business in a way constituting only one truth and it should lead better decisions at last.

For example, in aforementioned Harrah's entertainment company in transforming the company into an analytical competitor, CEO Gary Loveman had primarily provided that the managers of all casinos gave reports to him and made sure that programs related to customer relations had operated in the same way in all of the casinos. Before Gary's intervention each property was like a fiefdom, managed by feudal lords with occasional interruptions from the king or the queen who passed through town. Each property has its own P&L and its own resource stream, and the notion that you would take a customer and encourage them to do their gaming at other properties was not common practice.[22]

It is not enough for the companies only to merge data, to gather analysts or to form a company-wide IT platform in order to generate an enterprise wide perspective, the main concern is to change this data's limited and scrappy perspectives fed by the needs, the fears and the subjects remaining on the agenda of the company-wide managers with an individual and holistic perspective. Because, companies which can not look to data from a broad perspective, can not estimate which performance factors lead to the projected growth and profitability, how they can be effective by estimating changing market conditions or how a rise in customer loyalty effects profitability, among which chains and products marketing budgets should be distributed and how.

[22] Rajiv Lal and Patricia Matrone Carrolo, (2002), Harrah's Entertainment,Inc. Case 9-502-011,Harvard Business School, Boston, USA, p.6

Enterprise level management requires the data and the analyses to be able to be used and necessary interest to be shown in data management for analyses with data to be carried out effectively and efficiently. It should be known that it will be hard to recoup if the data which will carry the company through is wrong and not extensive.

What is meant with enterprise management may differ in organizations. Whereas it is the management of data and the procedures carried out by only a central IT group and installing related software for the application of this data by the departments for some organizations, it is to form a central analytical group that will support administrators in analysis and decision making for the others. When examining the subject from a it specialist's view, name of this central analytical group is BICC(Business Intelligence and Competency Center) and it is defined as a cross-functional organizational team that has defined tasks, roles, responsibilities and processes for supporting and promoting the effective use of Business Intelligence (BI) across an organization[23].

2.1.3. Senior Management Commitment

Adopting of analytical competition by organizations requires changes in skills of the workers, culture, business manner and behavior of the organization. If we were to choose one factor in order to measure how much analytical an organization is, it would be leadership. Because it is not possible for all of these changes to happen accidentally on their own, leaders can lead their employees to change by controlling people, money, and time. When we say leadership and think it as enterprise-wide, absolutely first thing to come into mind is CEO but each of the employees may help organization to be more analytical.

Let's give below some common characteristics of analytical leaders, even there does not exist a leader who has all of these characteristics, leaders who carry these characteristics as much as possible, can be considered more successful.

1. First of all we have to say that they should have good human relations, though it may sound ordinary when we say this, we may say that people who have high analytical skills,

[23]WEB_10, Wikipedia contributors, Business Intelligence Competency Center, http://en.wikipedia.org/wiki/Business_Intelligence_Competency_Center, 1/25/2014

are usually introverted, have difficulty in developing empathy, is ineligible in human relations and choose machines instead of people but a leader is the one who can combine analytical skills with the success in human relations.

2. Analytical leaders should be the people who always compress for more data and more analyses. The most basic characteristic of an analytical leader is that he relies on data and analyses in decision making. For this reason he should encourage his employees who come to him and make suggestion based only on their instincts for collecting more data and convince them about that it is necessary for them to make suggestions based on correlation analysis or other statistical analyses. CEO of Sara Lee Bakery Group Barry Beracha who has a signboard in his room on which "In God we trust; all others bring data" is written, can be a good example for this subject.

3. Analytical leaders are the people who take people with high analytical intelligence into service and show them respect as required. They are the leaders who take more phd's and mba's that are experts in the field of analytics into their business and provide them working conditions they require, applaud them for their works and succeed in motivating them diversely. They are aware of that employed people are the ones who will shape company's future and determined the place of company in the future.

4. A leader who wants to lead his workers to analytics, by using analytical methodology in his own decisions and analyses he performs, he should encourage and inspire his workers.

5. Leader should also be a teacher. As well as he can teach analytical techniques directly, sometimes he should provide his co-workers to increase their capacities by motivating them only in the subject of more carefully thinking and decision making.

Of course analytical tendency of the leader has great contribution in success. It enhances company's analytical tendency and effects its mentality as well. And he contributes to development by guiding brain storming in company regarding to analytics and making IT investments. It should not be forgotten that an analytical transformation of a company takes long time.

2.1.4. Large Scale Ambition

Last parameter to use for describing analytical competitive companies is the results that they are dying for to obtain. If our goal is not defined, corporate and noble, it is not possible for our projects and goals to make us accomplish our objectives and to do this permanently and sustainably[24].Analytical competitive companies, at least the ones I've read up to now have always seen analytics as the way leading to company's future and an important element of its strategy, and they have not abstained from taking risk for this cause.

When we look at the past, the decisions made by analytical competitive companies may seem wise and rational but by the date they were applied, they were radical decisions for their industry. For example, When Netflix were founded by Red Hasting in 1997, Blockbuster whom competitor it planned to be, had available annual profit of 3 billion dollars, thousands of stores all across America and the world. Besides it was not the only company in this sector.[25] Moreover analysts of Wallstreet had tagged Netflix as "a worthless piece of crap"[26] because that they thought Netflix could not compete with the companies like Blockbuster, Wal-Mart, Google, Microsoft. Well then, how could a man who had nothing in hand more than the idea of operating video rental stores with a membership system like sports halls do and marketing approach just like any other net based company, be that much successful in the sector and if we're to move one step forward how could he cook Blockbuster's goose? The answer to this question is that Netflix had seen analytics as an inseparable part of company's strategy and had made decisions according to analytical parameters and gained competitive advantage.

When we look to the example of Capital One, they had tried to sell their analytical approach which they called information-based strategy to all timely known credit card companies but only Signed Bank had drawn close to change its strategy in this direction

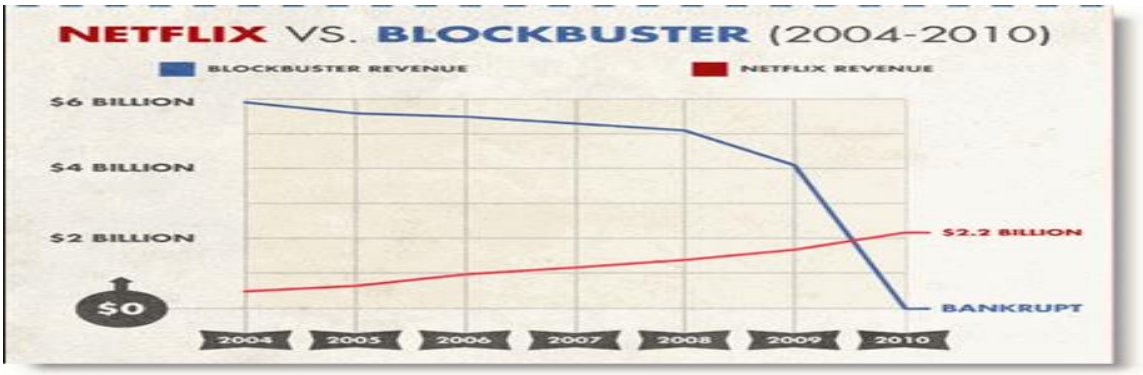
[24]Halil Aksu, (2013), Big Data ve Diğer Yeni Trendler, Pusula Yayıncılık, Istanbul, Turkey, p.5-6
[25] Stephen Gandel, (2010), How Blockbuster Failed at Failing, Time, 10/11/2010
[26] WEB_11, Bill Halal, How Netflix Beat Blockbuster: An Exemplar of Emerging Technologies, ,25/1/2014

and to carry out its credit card transactions over this idea and when considered it had faced up to risk its future.[27]

Undoubtedly that, not all the works in order to be analytical competitor have succeeded. Area and size of obtained results are related with how big effort had been spent. Whereas the results of slowly and tactical use of analytics are small, the companies that build their strategy and competition on analytics have become more successful. Well then, for who, for what? In fact the most efficient method to Measure Company's analytical tendency is to look at its total income, profit, customer's loyalty and value of its shares.

Although there are many examples I want to mention a few here. For instance, American airways which applied analytics to the field of pricing strategy, had visibly increased profitability of the company in 1980's and by means of ticket price optimization it had 1.2 billion dollar profit in 3 years. This situation was enough to go its competitors such as People Express out of the play[28].

While its competitor Blockbuster had made a loss of 518 million dollars and get into dept. of 1 billion dollars as by the year 2010, Netflix which has almost 16 million subscribers today, in 2010 had made a profit of 116 million dollars and had succeeded to increase its stock prices which was 11 dollars in 2005 up to 363 dollars by the date on which this thesis is written.[29]



[27] Thomas H. Davenport, Jeanne G. Harris, (2007), Competing on Analytics, Harvard Business Press, Boston, USA, s.33.
[28] Barry C. Smith, Dirk P. Gunther, B. Venkateshwara Rao, and Richard M. Ratliff,(2001), E-Commerce and Operations Research in Airline Planning, Marketing, and Distribution, Interfaces, p.37-55
[29] Cecilia Kang, (2011), Is Dish Network's new sidekick it's secret weapon?, Washington Post, 24/4/2011

Figure 2.4. Netflix vs Blockbuster revenue

Source: http://go-digital.net/blog/wp-content/uploads/2011/02/netflix-vs-blockbuster-revenues.gif

2.2. Analytical Competition Levels

As we mentioned above, in today's global competitive world the companies are not interested to find answers to what happened in the past or why but they are more concerned about what is going on today and what may happen in the future. According to the research[30] which was carried out by MIT Sloan School of Management Review together with IBM Institute of Business Value in 30 different industries and with the participation of 3000 administrators in more than 100 countries, the companies which use analytics in the best way, have been using analytics two times more in business activities in comparison with their competitors at one level below, and trying to gain advantage by screening the data they have in different ways and maybe the hardest part of this analytical transformation is to change the culture of the company and management. We have listed similar characteristics of analytical competitive companies and given examples of the sectors before. As we know these characteristics it is time to talk about how we can classify organization according to analytical tendencies.

The five stages of analytical competition

[30] Steve LaValle, Eric Lesser, Rebecca Shockley, Michael S. Hopkins and Nina Kruschwitz,(2011), Big Data, Analytics and the Path From Insights to Value, December-February 2011, Vol.52 No.2

Figure 2.5. Analytic competition pyramid

Source: Thomas H. Davenport, Jeanne G. Harris; "Competing on Analytics", Harvard Business Press, 2007, s.35.

5 steps seen on the table shows the stages that an organization has to pass in order to become an analytical competitor. "Analytical competitors" which is on the top represents the companies which have succeeded to go beyond of their desired results related to analytics, usually try to decrease the costs by automatizing and increasing the efficiency in their existing business manners, have integrated analytical competition with their business processes, have absolutely targets serving for a certain goal such as to increase customer loyalty, to make supply chain efficient, to carry out better asset management and to motivate people, to collect high skilled people in the personnel pool, have been approved by CEO in analytical tendency, have adopted fact based management as passion and use analytics to make themselves distinctive. Analytical approach of these companies is company-wide and data has been collected in one general center and has been offered for the use of whole company. Usually they have BICCs that support abovementioned administrators and workers in decision making processes. Generally analytical data is given a seat in reports and presentations presented to company partners and there is an apparent use of analytics inside the organization. Companies such as Capital One, Netflix, Harrah's Entertainment, Google which were given as examples in thesis up to now can be counted among these. Because that these organizations have once succeeded to totally reveal their

analytical capacity they are in the search of new fields which they can apply analytics permanently, but while doing this they do not leave out the field that they differentiate themselves and is their main focused point. Besides these companies see themselves as analytical competitors in both interior working fields that are finance, production, r&d, and human resources and exterior working fields that are customer and supply applications.

"Analytical companies" on the 4th stage are companies that have intense analytical activities. They have the sources like human power and technology which are required in order to become analytical competitors and they use analytics regularly. Their customers may complain about service and quality or the researches they carry out may indicate that they are wasting the resources but these organizations may not response in time because that they can not determine their prior goals in the way they pull to become an analytical competitor or while they have adopted analytical competition in some fields, they may be competing in some other strong fields such as customer relations. It should not be forgotten that all analytical competitive organizations need a field in which they can be rewarded for their effort and gain competitive advantage in comparison to their competitors and they are the best. Otherwise, although CEO and administrators in these organizations support analytical methodology, yet they don't consider it as an inseparable part of company's competition skill or maybe they don't want to compete on these parameters enough. Still the companies on the 4th stage can be analytical competitors with a little effort.

For example, X GSM company which competes in Turkish market, has formed individual customer profile by summarizing the data such as customers' previous term uses, demographic details, active packages, participations in special offers, club and segment information in order to develop its business by understanding its customers' behaviors and thus it has been transiently presenting its customers the offers they need by being triggered from customers' instantaneous behaviors. But they are still indicating that they have been trying to cover a distance in the subject of social media, location and interaction focused campaign[31]. For this reason it can not totally be called as analytical competitive company

[31] Halil Aksu, (2013), Big Data ve Diğer Yeni Trendler, Pusula Yayıncılık, Istanbul, Turkey, p.113

although it has human power and technology which can use analytics. For example, according to this interview I get the result that it competes in services it gives. But it does not yet has a service package which offers more than 2 millions package options that can be customized as company Y provides.

The companies which we call "analytic aspirations" on 3rd Stage are the companies that have understood the importance of analytics, decided to compete but have a long distance in order to be successful for this cause. Two types of companies can be considered on 3rd stage. As one of the most important aforementioned characteristics of analytics oriented companies is administrators' passion and commitment in this direction, first of them is the companies which start working recently but their administrators have vision in this direction. The second is the organizations of which there autonomy functionally between its departments, each department use different analytical solutions for their own needs but can not combine these needs and can not reach a company wide solution.

The insurance company which is one the first 9 names of Turkish Insurance sector, can be given as example for these organizations. In an interview, IT manager of the company, Mr. Hasan said one of our analytical studies is the risk pricing in the branch of automobile insurance and mentioned that they had started to evaluate risk pricing that they were doing looking at vehicle data before (license plate code, vehicle model, year of vehicle model) not only with vehicle data but also with customer and vehicle perspective to the question: "Have rational results that are obtained after analytical studies changed anything?". He also added that currently the company was making use of analytics only in risk evaluation and loss processes and they were working in order to use analytics in other departments[32] .

As you may see, there exist an analytics use which limited with only certain departments, it is yet away from being enterprise wide but Mr. Hasan has touched upon that they were examining different opportunities to use but firstly they required knowledge and experience for this. Here we can understand that company adopts test and learn method, and will progress by proving the value of the business to executives and needs time. As top

[32]Halil Aksu, (2013), Big Data ve Diğer Yeni Trendler, Pusula Yayıncılık, Istanbul, Turkey, p.53-54

management has adopted some methods regarding to risk management and been trying yo progress in this direction I interpret this company as a stage 3 company.

Stage 2 companies are companies that have covered a distance for being analytical but use of analytics can not move forward from being at personal and departmental level. In spite of using analytics in departments that make risk quantification such as actuary and in business of which mathematical measurement is relatively easier such as marketing and production, these companies do not see analytics as a part of the competition strategy. The main difference of these companies from the third stage companies can be summarized such that the administrators on this stage do not have an interest or have limited interest in analytics.

It was the same as this in one of the public corporations that I had worked on project basis. Budget of it department is not enough to buy a complete analytical solution but human resources department was carrying out 360 degrees evaluations and was using analytical methods to form performance report cards. In some departments like strategy department there were some people who work personally at spreadsheets level. But due to bureaucratic structure of corporation, and the facts that the institution was under the control of government and time did not mean money executives did not show enough interest. Despite using same or similar technologies with analytical competitive companies, this type of companies are considered as stage 2 companies because of lacking of top management mentality and adaptation as we mentioned before.

Stage 1 companies which are called Analytical Blind have some desire to become more analytical, but those far they lack the will and skills to do so. They face some substantial barriers both organizational and technical[33]. Shortly yet they are the companies that make effort on installing some software, could not achieve to collect data regarding to business processes in a central point and do not have a lot action except from reporting.

[33] Thomas H. Davenport, Don Cohen, and Al Jacobson, Competing on Analytics, Babson Executive Education, p.4

3. CHAPTER – INCREASING ANALYTICAL CAPACITY

3.1. Analytical Data

When examined the past of the organizations like Marriott, Mars Group, Procter&Gamble which includes multi decadal intense data and analysis or considering companies which were born as analytical competitors like Google, Netflix, BestBuy, amazon, Capital One, increasing their analytical capacities and climbing the competition ladder may seem relatively easy. But it should not be forgotten that these companies have made data analyses, top management support and use of companywide analytics in order to reach the conditions they are in today.

Most of the organizations we see have neither an analytical capacity nor a plan to improve their analytical capacity indeed and as a matter of fact there is not a short cut for the companies that want to become analytical competitors. If we compare being analytic competitor to a big puzzle, it would be understood more easily that there are many particles to complete this puzzle. The most important part of this puzzle is data. Data is the prerequisite for all studies, it should be clear. For instance, data of sold products should include a unique identifier for each of the products (Primary Key), it should reserve product name and product properties without an error. If it is obtained from more than one sources then it should combined in a way to provide the consistency of the data obtained from all sources and to make sense. If there is not sufficient data in the hands of an organization, it should firstly set up the required systems in order to collect the data in its business manners.

If quality of data is not sufficient, it might be more rational to postpone the plan we made for analytical competition. For example, before starting to use analytics for one of the drug companies I have worked, a software had been developed related to drugs represented, doctors visited and expenses done by almost 3000 pharmaceutical representatives and after using it for almost 1 year we could decide that data could get to a position so that it could give us idea about organization’s dynamics when it was examined by analytical methods.

By the way I'd like to point out that there is a special case in the subject that concerns society such as health industry. Today governments support the movement "data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control"[34] that is called open data especially for the researches related to pharmaceutical industry and provide for labeling obtained data such as molecule, drug substance developing, genetic tissue, gender, race, age group and announcing obtained data to public without touching upon company's privacy. Think about this, the fact that everyone makes analyses and experiments on these data can conduce what kind of inventions and improvements in the field of fighting with diseases[35].

Al right than, how can we understand that data is sufficient for analytical models? In fact this is a hard question, although it differs from system to system, analytical director of TripAdvisor website Michael Berry explains how he understands that the data is sufficient for predictive model in one of the examples he gives. When Berry wanted to know the standard bid by travel agency partners for a specific hotel and specific customer, he began computing averages: The first two bids compared to the first three bids compared to the first four bids and so on until he hit a steady plateau at 100,000. If he kept going to 200,000 bids, the average would change, sure, but not enough to matter.[36]

If there is enterprise-wide use of analytics, most of the problems faced related to data management can be solved much easily. Some of you may ask we had started out with a problem related to only one business line, why is enterprise-wide data management necessary? First reason of this can be indicated as most of the big analytical software packages which enhance business performance and analytical competition are in interaction with more than one part of the business. Moreover, for instance, in businesses that require cross department use which needs data related to the business of more than one department

[34] Auer, S. R., Bizer, C.; Kobilarov, G., Lehmann, J., Cyganiak, R., Ives, Z., (2007), DBpedia: A Nucleus for a Web of Open Data. The Semantic Web. Lecture Notes in Computer Science 4825. p. 722

[35] WEB_12, Erika Check Hayden, (2012), Open-data project aims to ease the way for genomic research, Nature.com, http://www.nature.com/news/open-data-project-aims-to-ease-the-way-for-genomic-research-1.10507 ,2/5/2014

[36] WEB_13, Ted O'Brien, (2013), Big Data and Predictive Analytics: When is Enough Data Enough?, http://blog.starbridgepartners.com/2013/10/10/big-data-and-predictive-analytics-when-is-enough-data-enough/#.U7AEWfmSwmx ,2/5/2014

such as correspondence department in which received documents are examined and directed to relevant departments for being answered, reserving data, analysts and technology under a structure like BICS that we mentioned before, will probably prevent waste of resources. Businesses carried out without perspective of enterprise are sentenced to remain as spreadsheets in the computers of many people and little analytical attempts at department level and it will more and more difficult to bring out an attempt which will enhance profitability, share value and produced value of the company from these little attempts. Apart from this in businesses which have critical importance for sustainability of the company such as purchase and selling transactions, the most important thing is not only to response as soon as possible but it is also the accuracy and singularity of information in whole business. And this can be possible only with an enterprise level implementation. In addition to these, enterprise level data management helps all administrators to see whole organization real timely and to watch the competition by accommodating to market conditions.

Organization may have an advanced IT department, and there exist qualified and practicable data in this IT department's hands. But in the end it all comes down to people. The best of intentions can go awry if the goals of the analytics professionals and the end business consumers are not aligned.[37] It is necessary for analytical leader to well determine business priorities and problems and to choose properly the metrics which will be used to measure and if the leaders are not prone to analytical competition and there exist leaders who are allergic to data and build up administration mentality performed by instincts more than data, it will be imaginariness to expect from administrations enough support for analytical transformation. Companies which use analytics in the fields of human resources, financial systems, supply chain, customer relations and business decisions in order to gain direct competitive advantage need a special type of leadership. Senior managers of these companies do not only devote themselves to succeed in analytical projects but they are also stick to management based on quantitative reality with passion. Long term goal of these

[37] Michael Minelli, Michele Chambers, Ambiga Dhiraj, (2013),Big Data Big Analytics: Emerging Business İntelligence and Analytical Trends for Today's Businesses, Wiley, p.127

managers is not only to use analytics to perform in useful fields but also to become more analytical in decision making types and systems.

Even the most analytics-oriented leaders estimate the return of investment before investing related to their analytical projects. In correspondence we have with Luis Fleitas who is the marketing analyst of Targit (www.targit.com) , software solution provider for Axap which is the ERP software of Microsoft, had mentioned that no one make investments to analytical solutions without looking at the variables such as TCO(Total cost of ownership) and ROI(Return of Investment) or seeing their effects on organization by saying no one wants to invest thousands of dollars in a solution that won't give a fair return. Especially CFOs. ROI and TCO are the most basic measures for IT implementations and they represent probably the most straightforward way of understanding a solution's organizational impact. It is really necessary for the company to know primarily on which area to concentrate, where it wants to reach and transfer its limited analytical sources. This is only possible by setting a target. Because it is impossible for organization to be analytical in all aspects as analytical skills are not limitless. For example company strategy of Harrah's entertainment also determines its analytical strategy. Despite play tables and slot machines seem to be main assets of casinos, every one can get these machines so that it becomes harder to compete with the new companies in the sector. For this reason casinos should offer to each of its customers personal experiences or compete by opening new luxurious must-see casinos as we see in Nevada.

Over the last two decades the North American market was dominated by four major gaming empires. Three of those, namely MGM Grand, Caesars, and the Mandalay Group were following the 'must see' property strategy. Contrary to those aforementioned players, Harrah's decided that the huge capital costs of developing these 'glorious' properties did not prove a viable alternative in achieving long-term market growth – instead they chose to develop a core competence around customer loyalty.[38] Moreover, with amendments that America carried into effect in 1990 and were made regarding to province of casinos it had

[38] WEB_14, Peter Klugsberger, (2005), What made Harrahs an Innovation Leader?, http://www.urbino.net/downloadFiles/SI050620_PKlugsberger_Harrahs.pdf, 2/10/2014

enabled Harrah's to understand that it had to make profit with customer relations management and operating current casinos in the most effective way. In order to reach this goal, it had examined available customer data, customers' game playing habits and choices of Harrah's casinos down to the last detail. In order to enhance their business performance analytical competitive companies have to recruit the predictions they have developed by continuously checking data and improve their models. Thus it becomes possible for them to obtain company profitability by reaching their determined goals and get desired growth.

To ask these questions in the subject of determining from which business the company will get the biggest strategic value, will help the administrator in goal setting.

- This is our competing point. When I was running a lunch room in Bayrampaşa before, I tried to differ from others by providing the most qualified product with the best prices.
- Which point we differ from others? For example, whereas differing point for Harrah's is customer loyalty, UPS prefers to specialize in both customer relations and supply chain.
- In which fields can we use analytics in our business? For example; it can be used while offering the best price to the customers of an e-trade website by measuring its competitors' prices too or offering customized special offers for the customer groups about campaigns.
- What is the most important information for our business? For example, for a restaurant stock status and its competitors' prices can be the most important data.

In order to transform their company strategies into tangible operational results analytical competitive companies have to for new measuring metrics and by observing the performance they have to ensure that they transform into operational results.

Finally, analysts that are the last factor of analytical delta have to be mentioned. In the organization analysts are responsible for building up business models necessary for

organization to reach its aforementioned goals, performing necessary enhancement together with the insight obtained by working with data and keeping up-to-date, forming new algorithms by testing data and experiencing, enhancing the present. At the same time, they connect proprietors with technical parts of the organization as intercessors.

Before this part of thesis we have mentioned briefly common characteristics shared by analytical companies and I have touched upon analytical competition stages. Now in the light of analytical delta factors I am going to try to determine a road map by detailing performance factors that are possessed organization wide, how to choose a distinctive property, performance management and strategy applications, what kind of a leader has to be owned as human factor, how to improve analytical skills, how we can form a fact based culture in our organization and required technologic factors and showing what every company on each competition stage should do in order to climb to the next stage. You can see below analytical delta stages.

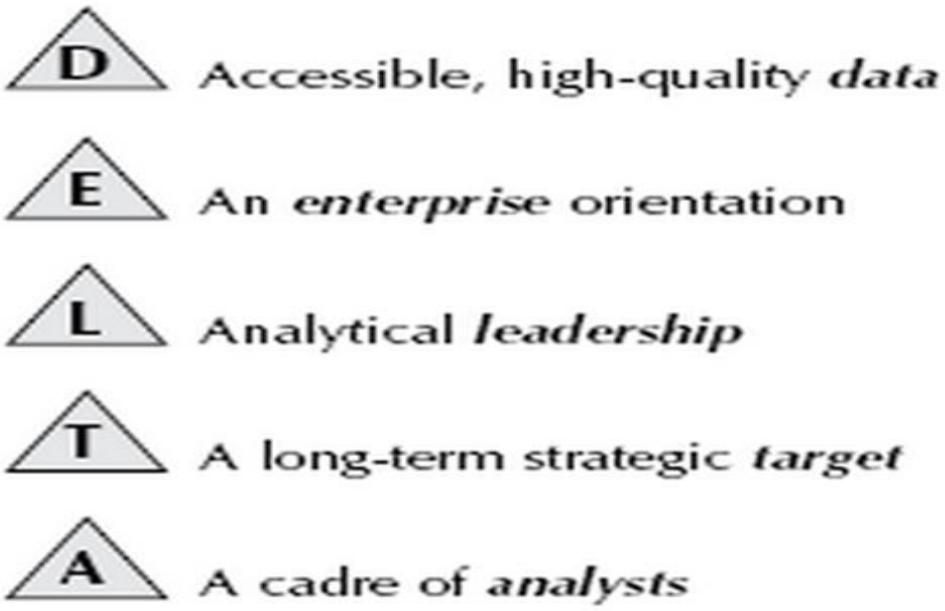


Figure 3.1. Analytical Delta

Source: Strategic Use of Analytics in Government, 2012, <http://semanticommunity.info/Analytics/Strategic_Use_of_Analytics_in_Government>

3.2. Accessible, high quality data

It is not possible for company to be analytical without data to be examined and made inferences from, our first suggestion to the organizations that want to be analytical was to set up the necessary system to collect transactional data and to bring this data up to high quality standards in order to move to upper stages in analytics, data are of high quality if they are fit for their intended uses in operations, decision-making, and planning. Data are fit for use if they are free of defects and possess desired feature[39] and it becomes possible by managing in the best way.

In this part we are going to touch on the data environment required by organizations in order to climb analytical competition stages and take a look at basic data components that are necessary for being stage 5 organization. Beginning from the most basic components which have to be known related to data, we are going to mention respectively, structure of data, what kind of a structure we should use in order to preserve and analyze data, how we can use available data differing from other organizations in the uniqueness of data part and what kind of advantage this provides, how we can unite the data coming from different systems and what we should pay attention to, general quality of data and necessary organization changes to provide this quality, how we will make this data accessible, how we will provide controlling while protecting the privacy of data we have.

3.2.1. Structure: Nature of Data

In computer science, a data structure is a particular way of storing and organizing data in a computer so that it can be used efficiently.[40] Moreover it is important that it determines the analyses that can be performed to your data. Companies use 3 types of structures for the data they will analyze. These can be shown as data clubs, arrays, and non-numeric.

[39] Thomas Redman, (2001), Data Quality: The Field Guide, Digital Press, Boston, USA p.74
[40] Lev Manovich, (2013), Software Takes Command, Bloomsbury Publishing, New York, USA, p.201

Transactions carried out by the business within the day are kept in structures which are composed of tables that we call OLTP (Online Transaction Processing). Today each business has at least one, and in some cases more than one OLTP database. Tables help us to be informed about the business we do, for instance, using the table structure we can find our net profit by comparing the sales of the same period in this year and the previous year and by means of deducting the costs. Also, it provides other useful information such as which of our employees do better job, and which of them remain passive. But it is an uphill work to take out this information from these tables. Even to produce a simple report we need great human power to make necessary calculations. The reason for this is that OLTP database‘s structure with tables is ideal for storing operational data, to analyze data we should use databases which are called

OLAP(Online Analytical Processing) and composed of ideal cubes for data analysis For this reason we transform the data that we get from OLTP database’s structure which is optimized in order to update, remove and add records, by formatting into cube structure which is suitable for OLAP database. Usually users never enter new entries and do editing in OLAP databases and OLAP cubes contain a few united tables. There might be 5 or 20 and sometimes more tables depending on how much we normalize OLTP database. For example, country and year of the sales constitute traditional three dimensional cube structure. But it should not be forgotten that being different from physical world data cubes can contain more than one dimension. A simple cube structure can be seen below:

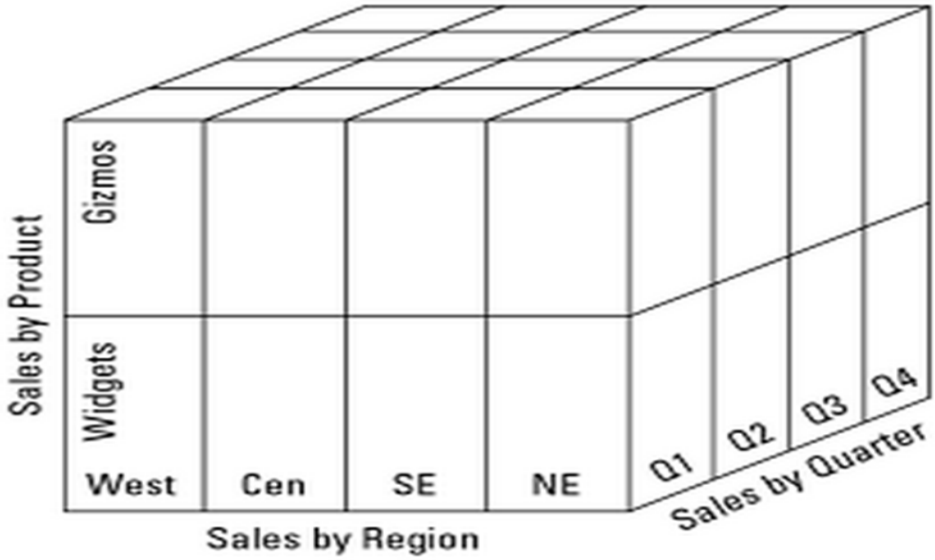


Figure 3.2. Multidimensional BI cube

Source : Swain Scheps, "Business Intelligence for Dummies",John Wiley & Sons , 2008, p.77

Cubes are ideal for slicing data and examining in some certain date range or constituting reports in a way to limit the variables to be examined by separating into smaller cubes. But they are not practical for analytical examinations because the dimensions they contain or in other words the variables are limited with the parameters which are included in the report that will be generated from cube and what the analysts who form the cube can think.

When we come to data arrays we can simply think of spreadsheets. Data arrays also contain rows and columns like spreadsheets. Because that arrays can contain thousands of variables they are ideal to understand data but because that structure of array based databases can be more complicated than traditional OLAP systems it is relatively hard to understand for users who are non-technical and have limited understanding for data structures.

Data type that has not ant format and is not based on traditional numerical data shows the last point on which data analysis is based. This type of data are not in type and structure that we get use to see in databases but today's companies show more interest on this data type day by day. For example, let's assume that you support the idea that was bandied about by motto of Verint which produces speech analytics software, "Nothing can tell you more about your business than the voice of your customers"[41] and think that your company should evaluate tone of voice of the customers which call your call center in order to measure your company's customer satisfaction rates. In this case evaluating tone of voice of customers you ought to record this variable in a certain scale. Similarly, to understand the sensibility of our customers about our company we may want to analyze social media, web sites and blogs, thus we can understand their sensibility and it could become possible to give quick responses rapidly to changing market conditions by understanding customer trends but in this case our warehouse is whole internet. Similarly again, companies gradually show interest to text analytics methods which are directed to their interior networks. Thus it becomes possible to obtain the highest value from available reports, documents, surveys, call center notes, online chat logs, and business writing. For example, by examining service notes regarding to the problems solved within the scope of warranty, it can be determined which piece of the sold product causes problem the most. Thus, a car producer company can determine problematic pieces and interfere without being obliged to deal with big claims of damage or with the lowest loss or may think of working with a different supplier regarding to problematic piece. Another example to give; by examining the writings in "others" part in which people write the things they want to add in the survey regarding the problems of Istanbul, a political party may see that the results are not like what they thought that it would be or may explore that the main source of dissatisfaction is in another subject then they thought of, or may explore new problems as well. I guess these examples are sufficient enough to show how valuable this data with no structure is for the companies. What should not be forgotten is the fact that just like in the works we do for

[41] WEB_15, Verint.com, Speech Analytics: Use the voice of your customer to optimize your business, http://www.verint.com/solutions/enterprise-workforce-optimization/products/speech-analytics/index, 6/20/2014

searching valuable mines in order to reach one gram of mine it is required to decompose solid, similar to mine searching here it is required to examine semantically a great number of data in order to reach a useful data.

Stage 5 analytical organizations are the companies that carry out more than one different project including arrays and cubes we mentioned here and use data with no structure like sound and text or at least test the fields it can use.

3.2.2. Uniqueness

In today's world in which many companies compete in more than one sector, although all the companies seem to understand the importance of data, to understand the importance of data, to see how it will take our company forward, to use it and using data in a way to lead other companies in the sector are quite different. It is inevitable to have similar analytical skills for the companies which improve their skills on same data. For example, data related to what our customers buy from us is the data that is only known by us and not possessed by anyone except from us in the sector. But in order to come to a point in competition we should make another inference from the data we have or we should possess a unique data differing from the data possessed by our competitors. Whereas making different inference from data becomes possible by using new metric, unique data mostly comes from the sources of which our competitors could not think to use before.

As Al Parisian who is CIO of Montana State Fund, said "You are what you eat with regard to data ..." The companies which give importance to data should be attentive to data just like the people who cares for their health. As we mentioned before, unique strategies require unique data and the organizations on stage 5 always seek after this unique data that other organizations do not have and use. There are many ways to reach unique data. First of these is to use a data source which is open to everyone but is not used by other companies in sector in a way to add value to our company. Smaato that was founded in 2005 can be an example for the use of data which has never been used in the sector before. Company provides the opportunity of effective targeting for the ones who give mobile advertisements using demographic details such as age, income, gender, roles in family (mother, father, kid)

which are composed by location details and behaviors of the people provided by Factual.com and geographic patterns such as home address, work address, activity points and behavioral patterns such as likes traveling, service provider in health, the person who wants to buy a car that factual.com shortly gives the name geo-behavioral patterns. Though it is not yet possible to see the results of the study as it has started in 2013, this type of usage has not been used before according to my researches in the sector it is not difficult to predict that it will succeed. Ragnar Kruse, CEO of Smaato summarizes this as "Mobile ad targeting has traditionally been a challenge, but by collaborating with Factual, we are giving advertisers an easier, more intuitive way to reach their target audience"[42]

Again Progressive Insurance can be shown as an example for the use of data which has never been used before in the sector. In 1996 Progressive had started to use aforementioned credit scores for pricing car insurance policies and surprisingly had found out that the relation between customers' accident probability and invoice payment probability was a good finding. Because that other companies in the sector had not used this data for the following four years the company had succeeded to increase its profitability.

But this new metric which provided Progressive to make profit in insurance sector did not remain as a secret for too long. First reason for this is the obligation of noticing regulatory institutions in the sector about according to which parameters the policies are priced. Other reason is that public data like credit score can easily be obtained by other competitive companies. It is still possible to differentiate our company by using data. Companies like Progressive regularly pursue undiscovered new markets and new business methods. For example, in customer group which is composed of motorcycle users and in which accident risk is high and this reflects on policies, as a result of the analyses progressive may see that users that are well educated, professional responsible and older than 30 carry less risk and may draw away by making promotions regarding to this group. Thus in the case of possessing same data with competitors, it becomes possible to leave behind the competitors which perform analyses with traditional methods.

[42] WEB_16, Bill Michells, (2013), Smaato Using Geopulse Audience to Improve Mobile Ad Targeting, http://blog.factual.com/smaato-using-geopulse-audience-to-improve-mobile-ad-targeting, 5/1/2014

To gain competitive advantage by using the data which is formed as a result of company's interior operations and customer relations is much easier as it belongs to company and is unique.

Darden restaurant chains that is the 29th employee in America with respect to company size, is among the pioneers of the concept called casual dining. In 009 financial year it had obtained 6.7 billion dollar income from 1770 restaurants it embodied and served more than 400 million meals. Their Ceo Clarence Otis had stated that this has become possible with analytical approach of the chain. For example, with forecasting application that they use for Olive Garden optimization of the ingredients that is used for each menu has become possible. Thus whereas Darden decreases the overtimes by 40%, it prevents food waste by almost 10%.[43]

For example, a lot of things have changed in 41 years from the day Best Buy had opened its doors to today. While the products have gradually become more sophisticated, decreasing prices have led the customers into a search of opportunity for owning the best and the recent products. Forming new customer segments parallel to this in its 1100 stores dispersed in America, Canada and China, Best Buy has adopted a customer focused vision. As a result of this analyzing the sales and customer demographics they have made arrangement targeting the best customers, and the data of customer loyalty program which they had started in 2003 has become an important data source supporting customer centered understanding. "The company is one of the first to transition from being product-focused to more customer-centric understanding [the consumer's] attitudes and behaviors wants needs and preferences and that drives a lot of their marketing strategy " says Jeff Zabin director-marketing at Fair Isaac a Minneapolis-based firm that helps Best Buy analyze its data and understand customers[44]

According to Zabin, 31% of Best Buy's customers constitute 80% of total income and more important than this 7% of these customers are responsible for 43% of total sales. Just

[43] Chuck Salter, (2009), Why America is Addicted to Olive Garden, Fast Company, July, 2009

[44] WEB_17, Sandra O'Loughlin, Inside Best Buy's Analytics-Based Customer-Centric Marketing Blueprint, Event Marketer, http://www.eventmarketer.com/article/inside-best-buys-analytics-based-customer-centric-marketing-blueprint#.UrkxHvRdXjk, 4/7/2014

for this reason Best Buy has rearranged its stores according to the needs of its elegant customers to whom it makes sales the most.

And sometimes this data which brings competitive advantage to company can be obtained from simple operations if the company can show up its real value. For example, Cisco Systems has been providing technical support for years to the networks of the companies which it sells equipment. Recently the company understood that it can predict network problems that the customers may encounter and necessary upgrades that should be done related to network growth rate by analyzing multidimensionally network configurations obtained from the companies it supports for many products and this kind of analyses have provided the sales of Cisco's products to make progress.

Apart from these, producing new performance metric may provide the company to make better decisions. For example, has determined ration of the sales to paid wages for each of its stores as performance metric thus measuring the ratio of labor force's value to total income has become possible. For instance, let's assume that weekly wage payment of a store is 10.000$ and the sales is 100.000$. This indicates that this company pays 100$ to its workers in order to make 1000$ sales. Wages to sales ratio is 10%. High wages to sales ratios show that workers are underperforming and have difficulty to sell the products. When the ratios decrease it means that the workers are more effective and the company obtains higher profitability. Thus, ratios help to make different management decisions. For example whereas workers showing high wages to sales ratio are laid off, extra working hours, increase in wages and different promotions can be offered to the workers who have low wages to sales ratios. And also if educated employees have low wages to sales ratios this effects recruitment policies of the company.[45]

Analyzing the examples of the abovementioned organizations we can predict that the companies that want be successful in a business line, need to have unique data that will differentiate themselves from their competitors and to analyze data obtained from interior

[45] WEB_18, Dennis Hartman, Wages to Sales Ratio, Chron.com, http://smallbusiness.chron.com/wages-sales-ratio-12713.html, 3/5/2014

processes of the company will be more valuable and even obligatory in the future. Stage 5 companies are the companies which have started to do this.

3.2.3. Integration: How to consolidate it from different sources

Integration and interpretation of the data coming from more than one source have vital importance for the organizations that want to climb the stages of analytical competition. But the systems used in the company like human resources, CRM, order follow –up are usually department based systems which are used in order to meet a certain need.

If we do not count on ERP systems most of the business systems of the company are the systems used on department basis in order to meet a certain need such as production systems, order follow- up, CRM. For this reason, despite ERP systems analytical organizations still have to integrate the data coming from more than one source. For example, Orion which is a Finland oriented medicine and diagnosis test producer, has been doing production, packaging and distribution of pharmaceuticals to worldwide pharmacies, hospitals and clinics. This type of organization as you may appreciate requires integration and management of data which has different roles in the operation and comes from hundreds of different companies. Jari Sappanen who is application technology manager of Orion that is responsible for smooth running of this whole process, explains that after big or small, whole customers send their orders to a correct and effective order follow- up system, operating this system's data together with supply chain, availability of necessary raw materials in production and packaging is optimized.[46] This type of prescriptive analytics skill can only be reached as a result of operating more than one system integratedly.

In addition to the example above, problems encountered by Jack O'Neill which is world wide famous store chain can be touched upon in order to serve as a model of integration

[46] WEB_19, Liaison Case Study, Liaison Technologies Cures Supply Chain Data Headache for Orion, http://liaison.com/docs/case-studies/liaison---orion-eu-integration-and-supplierweb-case-study.pdf?sfvrsn=10, 5/7/2014

problems. As the company which sales hundreds of surfing and skiing equipment with it's great number of producers, thousands of shops and distributors spread to 34 countries since it was opened on California Coast in 1952, do not have a central system to carry out order follow up and because that each of its distributors have their own ERP systems and their own data warehouses and none of these can contact with O'Neill's ERP system, the company has been facing logistics problems. And this effects directly company's customers and it almost becomes impossible to predict that the right product reaches to right customer at the right time. For this reason customers can not always reach to the most popular product groups and the company has been incurring losses. Even worse risk of surplus buying non popular product groups in has been encountered and the product which can not be sold results in increase of the costs. Company's Europe Integration Manager explains this with these words "We rely on pre-sales data to govern the amount of stock that is produced and delivered. We aim for absolutely no overspill, while also ensuring that customer demands are met, so require this data to be as accurate as possible. In our old environment, with no central resource to pull our data together, this was an almost impossible task."[47] O' Neill has solved this problem by forming an electronic data interchange (EDI) platform. It also has found a solution for the relations with its distributors by collecting all stocks and products that are on the sale under one system with only one warehouse and ERP system.

Many organizations need integration as you can see in the abovementioned case studies. Stage 5 analytical competitive companies are the companies who determine the most important data elements for themselves such as product, customer, store location and work non-stop to provide consistency. Thus it is hampered for different results from different departments to come. We all experience that meeting is conducted, different departments sit at the table with their own facts. Whereas according to sales department the value it adds to company is a certain number, according to finance department this values is totally

[47] WEB_20, Liaison Case Study, O'Neill Europe Consolidates its Diverse Range of Applications and Databases onto a Single, Easy-to-Use Platform in Just Two Months., http://liaison.com/docs/case-studies/liaison---oneill-eu-delta-ecs-case-study.pdf?sfvrsn=8, 5/7/2014

different. Sometimes conflicts in customer numbers occur, sometimes there are numerical problems regarding to production. It is probable for whole numbers different departments may have different results. Stage 5 companies are the organizations which provide that the most important variables in organization are singular and perceived the same by all departments.

In order to reach data singularity, instead of setting into work like removing whole data which may last forever and take it out of us, to determine the data that the organization will use for decision making and analysis and to remove objects like customer, product, etc. which are used organization wide, using required data can be a good solutions. This approach is called by organizations as master data management or (MDM) and defined as comprises the processes, governance, policies, standards and tools that consistently defines and manages the critical data of an organization to provide a single point of reference[48]

3.2.4. Quality

Although data quality is important, data in analytical decision making systems do not need a qualified data as simple reporting systems and transactional systems. A calculating analyst can overcome lost data problems by taking statistical examples which do not include lost data. Bad data input is a problem and collecting data coming from different systems constitutes the first part of the job. Before we mentioned that data mostly comes from transactional systems and transactional data has its own special problems. For example, it may possess visitor statistics which raises as a result of the visits of data search boots that we obtain from our websites, and the pages which we can not measure how many times they are visited because that google analytics is not tagged.

The best way to remove bad data is to determine the problems on the point that the data is produced, to understand the reason for bad data to be produced and to prevent it from being produced out of the gate. Although there is a good operating ERP system of

[48]WEB_21, SearchDataManagement, (2010), What is Master Data, TechTarget, http://searchdatamanagement.techtarget.com/definition/master-data-management, 5/7/2014

company, it usually can not block wrong input entered by the workers in front office, thus analyst should search for the source of the problems and it should be provided that the workers understand the importance of correct data in inputs such as customer, product. This may be possible with a system in which the workers that produce perfect data are rewarded.

Stage 5 companies are the companies which are aware of the fact that perfect data do not exist. But they have solved a large part of the data quality problems which can be determined at first sight. The data which is possessed by the company in the fields it catches competitive advantage is in adequate quality. For example, it can be predicted that in Harrah's entertainment they have a high qualified customer database and very few or more than one time inputted customer record as they compete based on customer relations. Stage 5 companies also have action plans and imaginative plans for enhancing data quality. At the same time they have systems for not producing bad data and controlling accuracy of produced data.

Iceland Food ltd. Company can be exemplified for enhancing data quality studies and importance of this. The company which is one of 10 biggest grocery store chain operating in England with its more 700 stores and two digit growth rate creates 1.800 million pound turnover. The company has been using conjunctively customers data that it had collected until mid-1980's for home delivery and direct marketing needs after storing it in local databases and steering through controls such as multiple recording input. But with Iceland Bonus Card which it offered to country wide use in 10th September in 2008, the company both enhanced store performance and found chance to analyze the product bought by the customers. But with Bonus Card offered to use, customer data which had to be examined had increased and quality of data had gained importance. As a result of capturing and cleansing of data of hundreds of thousands card owners and matching of the records in data warehouse with card owners, need of keeping each customer singular, updated and correct has arisen. Thus long waiting lines, delays in home delivery and customer dissatisfaction are prevented.

While IS Director of the company Mark Pearson was talking about the studies he performed in order to enhance data quality he mentioned that notifications to top management related to targeted data quality which is in use have been done regularly and explained that the importance of qualified data has been understood by senior management by saying "The Board recognizes that at Iceland Foods, good customer data improves business performance and they take an interest in data quality as a part of their overall governance duties"[49]

3.2.5. Access

In order to be analyzed data should be accessible. This becomes possible with discrimination of data from transactional systems where it is created and transfer of it to different systems that analysts can access. Stage 5 companies can provide data access with the transfer of data from transactional systems to aforementioned data warehouse systems which are optimized for data inquiry. As data integration is important these companies mostly constitute enterprise data warehouses (EDW). Thus they get the opportunity of feeding more than one units and functions in the company from one point. EDW's include all historical and current data we want to analyze but because that EDW's are the structures which include whole data and as a result of the fact that companies continuously renew themselves, increasing of data stored in this system may cause it to turn into complicated systems that common users can not understand. For this reason sometimes even in 5 stage companies it has been seen that data marts for the use of departments are formed in order to make data accessible. Thus making analyses on a limited data becomes possible. This approach simplifies non-technical users' works in cases where the problem we want to solve can be solved with the data of one department.

[49] WEB_22, Trillium Software, (2010), Case study Iceland Frozen Foods, http://www.trilliumsoftware.com/uploadedFiles/Iceland_Frozen_CS_10_2010.pdf, 5/7/2014

Moreover when we say access speed also is a matter which should be thought in tow. If the company carries out intense analytical studies it needs to head towards software and hardware solutions which are customized for this.

As some companies do not need to make available data accessible or due to company's transaction load because that it is not possible financially they can choose to take sample from their available data and to work on this data. This type of studies of sample may be sufficient for some analyses.

3.2.6. Privacy

3.2.6. Privacy

Analytical competitive companies collect the information which they need for the analyses they perform. This information is usually about the customers and sometimes it may be about employees and partners and this prevents collected information to change hands. Stage 5 companies are respectful to customers' privacy, they have well-defined company privacy policies and privacy of customers' personal details is guaranteed. In agreements they sign and data they collect they always inform customers, without taking permission they do not collect or share personal details. For example, when we call to a call center most of use hear that the company records our speech and will use it later for enhancing service quality. This is the notice given to customer about the data which will be collected. Similarly in most of the software packages for instance in Microsoft's product family it is asked for our permission to send to the company the details related to the use of the program.

Although it is very difficult because that in Europe and America there are many different personal privacy laws for multinational companies, to show respect to industry standards and to the laws of the country where the business operates is not a topic of argument. Even as we mentioned before, for example because that laws in America are more flexible, pharmaceutical companies' marketing departments access more data and for this reason in terms of analytics they are more developed in comparison with their branches in Europe.

Reason of this is that the companies show respect to the laws and sanctions of the country where they run the business.

These companies have arrangements related to the frequency of the contacts with customers to not to bother them. For example, it is hard to say for a company which bothers its customers by sending unnecessary messages that it is a stage 5 analytical competitor. Moreover these are the companies which prefer not pass the line when some of their analytical activities violate personal privacy rights.

Sometimes it is not enough to have an effective privacy policy, stage 5 companies give trainees to its employees who are in contact with the customers about protecting personal details and provide that the details which may harm customers do not come out. For example, Migros offers to its customers different promotions according to their shopping behaviors through Migros Card customer loyalty program. When a women who is aware of this calls the company to ask why the company offers condom promotions to her, even if the customer representative knows that condom were bought from the Card, he may prevent data to come out which may give harm to customer, even may result with the breakdown of marriage by saying that sometimes we give random promotions away.

3.2.7. Governance

In parts which are described up to now we explained data as if it has come to the expected points on its own, we could not mention about human factor that manages data. When we say data governance, we will be mentioning all of the methods and processes performed by human in order to ensure data reliability, data consistency, data quality, standardization of data, integration of data from different sources and accessibility of data, shortly its availability to be analyzed. In order to ensure the data reliability stage 5 analytical competitive companies have authorities who have different responsibility levels in the company thus to come up with a solution for problems related to data and to prevent the problems which may occur become possible. In this part we will touch upon the most important ones among this authorities; decision makers, owners/stewards and analytical data defenders.

Because that decision makers have a say in analytical strategy of the organization, to lead the organization in the right direction, to determine which data elements are important, and which require to be managed collectively and organization wide are their job. As all of the data possessed by the company can not be perfect, if the focus of analytical activities is customer to exemplify senior managers should agree on what customer is all across organization and which characteristic they have. Finally, as they are the sanctioners for investments which will be made for enhancing data they decide what kind of programs and attempts related to data will be carried out in the company.

Owners/Stewards assign different responsibilities intended for customer, product, call center data, logistics data and the others which they give importance in order to ease data management and increase reliability. Because the term ownership is full by its meaning, it may draw reaction. For this reason most of the organizations prefer to use Stewardship which means to make data utilizable for the business. This responsibility is a part time job usually performed not by IT but by the managers of related departments.

Analytical data defenders, IT departments of the companies usually have experience in the subject of setting data infrastructures, producing or installing of software that will process data and maintenance of this software. But they can not help about hoe the data will be used for reporting and analytical processes in the organization. For this reason companies try to deal with this problem by establishing information management and data focused groups. For example, BICC's that have gained popularity recently may be shown among these. And some other organizations may form Information Management (IM) groups that have more extended goals than business intelligence.

To possess BICC and IM groups is not sufficient for interconnecting the business with IT. Always keeping people concerned with some data in IT unit is important for ensuring that data is modeled properly and is ready to analyze.

3.2.8. Analytical Strategies of Data

1. Ground Zero (Stage 0)

As we mentioned before the first thing required by the company to begin to climb analytical competition stages is data. For this reason before starting analysis studies organization should improve their data management skills and they make a great effort for this.

For example the biggest supermarket chain Albert Heijn that operates in Holland, had spent a big effort in order to provide data quality and reliability. In the program that it had started for differentiating its stores in 1990's, the company had planned to make enhancements in different fields such as customer segmentation and offering diversity in new products. Company's senior management team which had planned this operation considering the costs, had started their work by integrating the data they obtain from company's different transactional systems on different points. They had form sketches related to company's information systems and taking this sketch as basis they had formed organization wide EDW (Enterprise Data Warehouse). Thus data obtained from all systems and stores had been integrated under one roof and they had got rid of large and small local systems. As a result integrating the whole data had costed 30 million dollars to company and finally they had formed PALLAS system which stores data related to company's operations for ten years and retrieve 75% of data of company's transactional systems that underlie today's analytical studies.

More than 3000 employees carry out varying reportings analysis studies on this database. Moreover each week more than 60 thousand of customers have the opportunity to follow the shopping they have done by means of the cards they obtained from company's bonuskaarten customer loyalty program. Through this system it can be inquired transiently related to management and some special items. After constituting the system required by the company for reporting transactions, Albert Heijn has headed towards analytical studies and has succeeded to reach an incredible financial success and profitability by integrating forecasting models with artificial intelligence systems which you may see only a few retail

sectors.[50] In the following part we are going to talk about what kind of data organizations require in order to climb the analytical stages and try to determine a road map related to data.

2. Stage 1 to Stage 2

A company of which data use is at stage 1 level, firstly requires simple data management because even there is data in hand it does not have reliability and its quality is not suitable for carry out analysis studies. For this reason, these companies first have to try to carry this data which is obtained by transactional systems into a form and quality which are necessary to make analysis. Stage 1 companies do not have EDW systems yet but some operational databases and data marts which can be shown as smaller scale of data warehouses may exist.

In order to move forward from stage 1 to stage 2, first of all, at least locally all of the activities including data should be started. Obtaining required data and leading of required analytical workers inside the company or assigning of them in the departments where analytical attempts will be started with new recruitments have vital importance. As any analytical competition focusing does not exist in organization yet, there are more than one goals and this prevents to head forward to the project related to enhancement of data quality and data accessibility.

3. Stage 2 to Stage 3

Due positive result obtained at departmental level, senior executives have begun to warm towards analytics, come to a position encouraging the people who make organization wide analytics and data studies, to collaborate and contact. In this point the important thing is to get positive results using data. For example, it is important to explore new data sources, to transfer some new parameters to analysis systems from transactional databases, to integrate some external data sources to the system, and to be utilizable for analytical analyses. For instance, for a pharmaceutical company the data which are taken from IMS

[50] Thomas H. Davenport, Jeanne G. Harris, Robert Morison, (2010), Analytics at Work: Smarter Decisions, Better Results, Harvard Business School Press, Boston, USA, p.38.

and show sales analyses according to regions and bricks, are an important source which support the studies. Besides, in this stage consensus at least about primary goals can be reached. Moreover this is the stage that senior management gains broader vision about business dynamics as a result of working on data using reporting systems and gradually has opinion about the data which has to be integrated in tow and shared.

To determine a company-wide goal at the beginning, will encourage the company to make studies related to key data which seems to lead the future of the company. For example, if our company is a software company and it thinks that its most important asset will be human resources, to form a candidate data warehouse in which candidate details will be stored, and to train people who adopt analytical methodology and have knowledge of the matter should be its first goal. Similarly if our company is a chain store operating in retail sector or a company operating in pharmaceutical sector, to exemplify it will be required to give importance to customer data for customer loyalty programs or genomic data for drug development studies.

In transition from stage 2 to stage 3, first ideas related to evaluation of data and other sources at organization level have begun to come up. As a result of this approach it becomes possible to look at the data with a broader scanning. In this stage it is also important to provide organization wide adaptation of these approaches by rewarding the executives that have developed data and analysis skills successfully in their own departments.

4. Stage 3 to stage 4

In Stage 3 companies' visions related their goals that they want to reach using analytics, have been generated. The condition for being called as stage 4 company is to form organization wide worthwhile projects. When considered as data, we can think it as to generate enterprise data warehouses including more one department by performing data integration. This kind of projects gains importance in senior management commitment due their need for big financial sources.

5. Stage 4 to stage 5

There is not a big difference between stage 4 and stage 5 organizations with respect to data management. They usually use same technologies. The difference is that stage 5 companies are contingent upon analytics approach with passion and they consider is as an inseparable part of their strategy. This organizations can also be discriminated from others with their pursuit for unique data which will provide them compete analytically and their special units such as BICC and IM which will connect business and IT.

As the main difference between stage 4 and stage 5 companies is the passionate approach to analytics as we mentioned above, stage 4 companies can provide transition by assembling meetings related to importance of data which is well managed and makes organization different and excites senior executives related to the opportunities it gives to company and giving examples of companies that use data to create competitive advantage.

3.3. Enterprise

Up to this point we have talked about data and data's stages. We mentioned that entries like customer, product which are studied on, can be concentrated by generating enterprise data warehouses due to the need of companywide deduplication coming up with the increasing competence of the company, and thus it is provided to be interpreted similarly by all of departments of the company. Companywide analytical approach enables employees to understand dynamic business better and to make better decisions.

Today that analytics is at issue in executive meetings as it forms the competitive strategy of company, great amount of data, information, content possessed by the company have provided to focus more on analytical disciplines which enable to make better decisions. But when developing companywide analytics is said, not only integration and binding of data from different departments, enhancement of communication and cooperation between the analysts working in different departments, if possible gathering under a single roof such as

IM or BICC as we mentioned before, or generating an IT infrastructure which will provide rapid-access of company wide data should come to mind. All of these we listed will surely make our business easier but the main thing is to get rid of administrators' scrappy visions that are limited with the department/s they deal with and they form due to their own agenda, fears and needs.

This singular perspective may avail public institutions as well as companies. For example considering what kind of contributions enterprise approach in services provided by the government will have, let's take city of Bolzano of which one fourth of population is composed of retirees. This situations cause pressure on health and social services. IBM which makes studies in this city, has developed a censor network that pursues situations constituting "normal" behavior schemas like regular cooking times as well as conditions in houses such as temperature, CO_2 level and water use. In abnormal situations it is provided to call a kin or friend who can control whether the old person is alright or not, and an alarm is given for providing proper service in necessary situations. And at backstage a general IT system has been providing a coordinating system by integrating all related institutions such as social services, health and property maintenance. Authorities in the city believe that this enterprise has brought down the assistance and care costs by 30% and it is provided that much more retirees stay at their home thus the need for constructing and managing special housing facilities for elders has been decreasing.[51] As you can see in this system integration of more than one data resource and the use of these data resources in a way supporting more than one unit at backstage is the topic, the data taken from different censors are evaluated and used between different departments, in this case it is used between government units. Later on determining the electric need of the city and enhancing profitability and efficiency by applying different price lists according to usage rates and selling of data obtained from the system to varying private institutions by government in order to give financial support are probable. For example, it may be used with different goals like taking target advertisements to target watchers by entertainment sector looking at

[51] Rashik Parmar, Ian Mackenzie, David Cohn ve David Gann, (2014), İnovasyonun yeni modelleri, Harvard Business Review Türkiye, Ocak-Şubat, p.86

ratings. I guess this will be enough to briefly summarize the effect of enterprise wide approach on costs and consequently to profitability.

Enterprise wide analytical approach will help us to determine the processes in the company that are not matured sufficiently for analytics such as which factors effect company's profitability and growth the most and which of them build barriers. It makes possible for the administrators to find solutions to problems that it is not possible to solve without seeing companies' working regions, working units, processes as whole. Without this approach it is not possible for the company to determine the problems that effect competitiveness in sector, to make better and more productive decisions and to presage the problems that may arise. When information is distributed and inaccessible questions with vital importance remain unanswered. For example, how we can accommodate to changing market conditions, how we should distribute our investments between our products, our branches in different countries and our marketing channels according to the use they provide us. It enables us to accommodate rapidly to changing market conditions because we can see all-round.

Of course only reason for adopting this approach is not performance and risk management involving company strategy. It enhances business and its processes at the same time. For example, IT can not predict business needs and support without a road map that shows in which direction analytical strategy and company move forward. And the most valuable sources of our company are spent on points which will not add enough value to our company and we miss the opportunities that will add big values to our company. IT which is not coordinated centrally and directed in the direction of company strategy, will head forward the simplest analytical projects or concentrate on the projects which have available data, worse, it will mostly throw in the towel, provide what available data includes and will not go beyond hoping for it to find an area of use in the company.

Apart from this, uncoordinated analytical effort mostly leads to formation of departmental systems and due to the fact that each of the departments or branches of multinational companies in different cities or countries will announce their own analytical freedom, systems that are hard to integrate and in which similar works are done again again

because it is not known who has a grasp of which information, are generated. As well as repeated businesses related to data, increase the probability of formation of conflictive and bad data, because that singularity of data can not be provided, everlasting conflicts will begin between administrators and workers who look at different data and systems, and due to the fact that everyone will allege that they are right relying on their own data, the units that have to work together will begin to compete against each other.

3.3.1. How Much Integration and Coordination

Especially holdings have been giving service to different types of customers in many fields in different markets. In this cast this question comes into mind: How far should we integrate our data, analyses, and business manners in this type of organization structures. For example, General Electric. It sells wind turbines, auto loans, jet engines, washing machines, fluorescent lightbulbs, and commercial air time on Saturday Night Live. Does data about its wind turbine clients in Germany and its washing machine customers in Thailand need to be shared across the entire corporation? Do customer analytics apply across those organizational boundaries? Probably not. But in some areas such as talent management and volume purchase agreements GE should share data from several or even all of its business.[52]

One of these companies which are spread to different geographies is Tesco. This England originated world's 3rd biggest retail chain which we mentioned before, carries out its operations in 13 different countries and provides its analytical studies by means of a company called Dunnyhumby which it bought after. Through customer loyalty program card which it calls Clubcard it has succeeded to double its sales since the card was released into market in 1995. Despite8 of this success it does not use a customer loyalty program for Fresh&Easy grocery store chain that it has in America. But there is a customer loyalty program that it calls Family Card for the brand Homeplus in Korea. Thus it is possible to say that the company differentiate its analytical strategies in different geographies and even for different brands it has. The fact that these companies which operate world wide, have to

[52]Thomas H. Davenport, Jeanne G. Harris, Robert Morison, (2010), Analytics at Work: Smarter Decisions, Better Results, Harvard Business School Press, Boston, USA p.48.

deal with different personal information laws in different countries and even in different regions in the same country, and sometimes companies in different regions can not reach some data can be shown as the reason for this. For example, whereas sales departments of pharmaceutical companies in America have the information accessibility at the level of which doctor has given which medicine, in Europe such accessibility is not available due to accessibility laws.

In order to determine how far analytical perspective can be used in an organization, asking whether the data is/ will be useful now/ in the future for other units or not, is the most sensible method. If there is a probability for any of the groups to share the same customers, market, stock or the suppliers, it will be a good choice to integrate this data. Besides it is sometimes probable that retail companies share information and analytical skills with suppliers and research companies. For example, Wall-Mart had decided to share data with Nielsen and SymphonyIRI Group regarding to shopping done as a result of agreements with these companies. As a result of this SymphonyIRI had released a press bulletin on 25th July and calling this customer-driven attempt the had with Wall mart, Customer Advantage, explained its function like this: Customer Advantage delivers unique, custom, Walmart-focused shopper insights and supports Walmart's collaborative planning process by providing a dedicated shopper insights portal of user-friendly, customizable reports shared between Walmart and its supplier partners. The solution contains multiple custom features, including exclusive Walmart business drivers, such as Walmart-defined shopping trips, geographies, and customer segments, as well as custom report templates that support Walmart's planning process with its supplier community[53].

Thus, it becomes possible for suppliers to predict regarding the orders which may be given in the future, and in this way to provide product always to be available by reducing lead times, to determine which products and categories decrease in stocks, and to minimize losses caused by delaying deliveries due to various reasons.

[53] WEB_23, SymphonyIRI, (2011), IRI Delivers Next-Generation Shopper Insights for World's Largest Retailer,Press Release, http://www.iriworldwide.com/NewsEvents/PressReleases/tabid/97/ItemID/1314/View/Details/Default.aspx, 5/7/2014

And sometimes data can not be approached globally as use of it is not utilizable practically or hampered by laws. For example it is not possible for Philips Morris to offer promotions customers by using customer relations management and encourage them. Because, in conjunction with the laws regarding to smoking bans show big differences from country to country, as well as in most countries cigarette commercials and promotions are forbidden, in some countries brand name written on cigarette boxes are also forbidden because of the fact that they incentivize.

3.3.2. Enterprise Stages

In stage 5 analytical competitive companies it has become possible for company-wide employees and administrators to make fact based decisions with enterprise-wide analytics approach. Analytics has gained a seat for itself in every business manners and it has been become apparent for every employee. As analytics use in company increases, there will be developments in the approach related to hereafter business dynamics. As long as workers and administrators understand business processes much better, they will find new fields to use analytics and make improvements in current operating systems and will produce new metrics in order to get ahead in the competition.

The whole system should be supported by a central IT organization which complies with the changes. So then companies may generate different structures. At this juncture let's look at these structure here

A. Global central analytics organization

This structure is the most aggressive analytical approach. Just like all other central approaches it is focused on solving problems with de factor and fruitful approaches. Moreover, despite of being central, with this structure it is possible to employ, to hire and to train regarding to company's business manners competent people from all around the world. But as for all structures, this structure also has some problems because that it is focused on producing central and de facto solutions regarding to whole company. It can not be focused on the problems that are instrinsic to region and country and encountered by the

branches in different countries that have regional problems which do not interest whole company or because that they are not prior enough they can not be solved rapidly. And most of the time it becomes necessary to hire an advisor for the solution of this type of specific problems.

B. Center of excellence approach

In comparison with global central analytical organizations this is a less central but fruitful model. In this model there are a few people in the center and company wide distributed analysts do not make reporting to this unit. But as well as carrying authority required for forming analytical structures this unit is responsible for providing support necessary for producing analytical solutions by taking on high skilled analysts regarding to subject. At the same time it performs building of infrastructure required for collecting and sharing of company wide information.

When we compare this structure with the central organization described in item A, it is not possible to set all structures and assignment required by company in order to be totally analytical in this center as it is in central structure. But it is possible to focus on models which are unique to regions and countries and other model goes off at half cock. It also makes it possible to share obtained information and to use companywide the current tools again and again.

C. Coordinated analyst approach

Both two of the approaches we mentioned above require a top management devoted to analytics and transformation of the company source at great amount to these analytical units. But in the companies which do not settle down to analytics at this level, there exist some coordination and an approach which do not require constituting a regular structure like others and in which there is a chance for analysts to do joint work. In this structure analysts are mainly focused on regional problems but they also work for problems which are in concern of the company globally, in a little part of their working hours. In 10-15% of these analysts' time, after findings of the problems related to whole company are collected

by a central analytical center and solutions coming from different analysts regarding to similar problems are examined and arranged, packages are formed and distributed to companywide related departments.

Now let's look at how enterprise approach evolves according to the stages.

1. Stage 1 to Stage 2

At this stage, there is not an enterprise view in terms of the company and there is not an analytical capacity to realize this or the company's interest about this subject. There may be some problems about the business which some employees have to solve for the company, but they cannot obtain the information they need to make correct decisions about their business from the systems of the company, or they have to content themselves with the data they limitedly get. Companies do not have to have Stage 1, and there may be some reporting systems personally developed by the above-written employees. At this stage, the analytical advocates in the company have to get support to their own ideas from the directors first if they are alone or few in number, so it will be easy to persuade the directors and employees who approach the subject with suspicion in the following stages. It will be reasonable to start with projects which are small-scale and enable to reach the relative objectives after support is found once, and we can say that our company passes to the stage 2 when profitableness of our projects is realized and they are accepted by the top management.

2. Stage 2 to Stage 3

At this stage, some of the projects which we have determined at the previous stages and are small-scale and enable us to receive relative and easy results have proved their adequacy in terms of the organization and managed to draw the attentions of CEO and other managers. The objective should be to start making plans about the enterprise analytical approach that focuses on the points important for the company at this stage. In addition, if it has not been done yet at this stage, IT organization should determine a vision and make a plan to support the analytical competition. At this stage, it has been seen that some vision holder companies have started to standardize their IT processes. In fact at this

stage, one should try to integrate and standardize the enterprise data in the fastest way by predicting about the increase of the analytical usage rates coming from IT users.

It is firstly necessary to fill the content of the enterprise definition, to determine what it is and constitute a vision about what can be done with the analytical approach together with the managers in the company. Then, what our objectives and projects are should be defined and which benefits we want to get as a result of our studies should be determined in order to constitute the analytical strategy of the company. One of the crucial points of this stage should be establishment of the auditing systems necessary for determination of accessible measurement metrics and measurement of these metrics. In order to ensure that available sources are used properly and effectively, one of the central analytical centers about which we previously mentioned can be established at this stage.

3. Stage 3 to Stage 4

At this stage, our company has turned gradually into an analytical enterprise from a company that tries to be analytical. Applications related to the enterprise analytical approach planned in Stage 3 have been started. At this stage, there is no more any rejection to the studies made from the senior management, and support coming from a group of visioners has turned into a companywide consensus and approach of "test and learn it" has gained a place in the company culture.

Studies for standardizing the data and technology has gained speed and new data policies have been started to be applied. However, because the changes related to the company business and culture are areas which take the longest time and may confront the employee resistance, it can be a reasonable approach to slowly apply the changes related to the new IT infrastructure and standards. At this stage, one can spare time on the studies which are made on singularity of the data and take long time.

4. Stage 4 to Stage 5

The analytic is no more an important competence for the organization and has become an integral part of the company strategy. At this stage, it is important to make Stage 2 and Stage 3 analytical applications in some secondary business units of the organization and

different geographical positions suitable for the entire system and to review and optimize the IT architecture and infrastructure in order to support intense analytic usage.

All groups supporting the analytic has turned into organizational groups like IT support and project management. In addition, as the company adapts to new business styles, some changes in business definitions and functions of employees are quite normal.

3.4. Leadership

There is a story known by everyone in the sector, and according to this story, Walmart wants to know more about its customers by combining the datas on customer cards and datas it obtain from the sales in safes and to explore the positive correlations between sales and customers. The data was mined extensively and many correlations appeared. Some of these were obvious; people who buy gin are also likely to buy tonic. They often also buy lemons. However, one correlation stood out like a sore thumb because it was so unexpected. On Friday afternoons, young American males who buy diapers (nappies) also have a predisposition to buy beer. No one had predicted that result, so no one would ever have even asked the question in the first place.[54] Although this story is a good story that draws attention to the difference between data mining and data inquiry, WalMart summarizes the situation that it has reached these results by examining the sales data warehouse with a customized software and obtained great profits by removing the positions of diapers and beers from each other by quickly taking action, and it is displayed as if everything is achieved by a powerful software. Human factor is not mentioned in the story. In fact, there is a need for smart people who will decide which pattern should be examined more deeply by analysing the data obtained and detecting the purchase patterns, so that suggestions can be made about the action the company should take with findings obtained about the business and understanding gained. In addition, another conclusion drawn from this story should be that analysts will not be enough by themselves. As we mentioned before, if we chose only one factor in order to determine how analytical an organization is, this would be leadership, because when leaders support the analytical enterprises, the

[54] Web_24, Mark Whitehorn, (2006), The parable of the beer and diapers: Never let the facts get in the way of a good story, http://www.theregister.co.uk/2006/08/15/beer_diapers/, 5/7/2014

possibility of success increases for them, and they can push the organizations to be more analytical because they are people who control the money, human source within the organization and are effective on the organization culture. Thus, it is necessary for a maneger to make decisions upon the information obtained from these findings and apply them in order to ensure that the findings and suggestions analysts accessed are useful within the organization.

In addition, people who have the authority to decide may not always have time to make related analysis or ability to repeat the analysis because of density of their agendas. If the person who has the authority to decide does not rely on the analysts or regard the results of the analysis made, suggestions based on these results will not be applied and a positive result cannot be achieved no matter how good analysis are made and how correct results are obtained by the analysts.

An interview made with the analysts of a bank that has a centre in Newyork and findings obtained as a result of the interview are included in the book called "Competing on Analytics" by Thomas H. Davenport about the results when the analysis of the analysts are not trusted. The analysts in the relative bank carry out an analysis study about the offices of the bank and so prepare a report that shows the activity costs, expenses and present cost and future profitability of each bank for determination of their profitability After preparing a list ordered according to the present and future profitability of all offices of the bank, the analysts determine a profitability line (red line) and present a report that includes their opinions about which offices should be kept open and which one should be closed to the top management.

Let's explain what happens after this point from the book of Davenport. Nary a branch was shut down. The retail banking executive who had asked for the list was mostly just curious about the profitability issue, and he hardly knew the analysts. He knew that there were many political considerations involved in, say, closing the branch in Brooklyn near where the borough president had grown up, even if it were well below the red line. Analytically based actions usually require a close, trusting relationship between analysts and decision maker, and that was missing at the bank. Because of the missing relationship,

the analysts didn't ask the right questions, and the executive didn't frame the question for them correctly.[55]

In short, the importance of the support of the top management for the companies which want to use the analytic with its all power in their business processes is indisputable. However, all employees of the organization have power to direct the business to be more analytical. In this part, we will mention about the leadership necessary for a more analytical organization and which characteristics these leaders share. Although it is difficult to find a leader that has all of these characteristics, leaders from various ranks exhibit one or a few of these characteristics in different rates.

3.4.1. Common Charasteristics of the Analytical Leaders

- **Succesful Communication**

The analytical leaders, generally leaders in fact, should have the ability of successful communication. Communicating and addressing are different things, and communicating requires establishing intimacy with another person and put yourself in his/her place. For this reason, great leaders come out of people who have the ability to wake emotions and desires of other people while talking about ideas. Because many changes will occur while referring a business to the analytical direction, to persuade and direct people to any direction we want gains importance, and it is important to earn people's trust, so you will ensure that they bare to you and are encouraged to change the present systems in the direction of your suggestions. A good leader also should be personal. He/she should care about people he/she talks, and he should not forget that people deal with how much you care about them first, rather than how much you know. The employees who are aware that they are cared will more forgiver in mistakes and short term problems confronted while progressing to be analytical. Although people who have an intense analytic tendency generally prefer computer systems and data to communication skills, they should understand that people are not computer systems they can issue a command and operate

[55]Thomas H. Davenport, Jeanne G. Harris, (2007), Competing on Analytics, Harvard Business Press, Boston, USA, s.133

and that many problems stem from the lack of in-house communication. To be a good leader is only possible in this way.

- ***Pushing for More Data and Analysis***

The analytical thinking is based on the data and sensible. In addition, it is objective and answers to the question why. The analytical leaders should reveal the asking why and inquiring sides of their employees by indicating that they wait for decisions which are based on the data and analysis from them. But first, the leader should get his/her hands dirty in order to inspire his/her employees and should be a passionate defender of the analytical approach and be an example for others by using the analytic in his decisions only because he/she loves it. The analytical leaders should persuade their employees who come with suggestions based on only intuitions to collect more data, to combine this data with other data he/she obtain from the systems, then to make correlation analysis and come with evidences supporting his/her suggestion. The statement of "In god we trust, all others bring data" on the wall of Barry Beracha, the CEO of Sara Lee Bakery Group that we have mentioned before explains how a good leader should be in the best way.

- **Working with Right People and Care about Them as They Deserve**

Some of you may remember the advertisement called 'Stolen Idea[56]' of FedEx. In our commercial film, a boss asks his employees how they can reduce their expenses and one of the employees says that he can save for 10% in the shipments by opening an account through FedEx.com. Upon this, nobody in the meeting says a word. Then, when the boss repeats the same idea, the whole team applauds for his great idea. Although it seems ironical, we encounter such bosses who do not respect their employees and show the analysis of their employees as if their own analysis in the meetings. Such behaviours stop the cooperation among the employees and limit the growing of the company. In addition, such leaders cannot be regarded as analytical leaders and actually cannot be included in any leader class.

[56] WEB_25, addict, (2007), Funny Federal Express commercial, http://www.youtube.com/watch?v=zNCrMEOqHpc, 5/7/2014

It sounds obvious but it doesn't always happen. Especially in highly political and hierarchical organizations, people often get credit based on their power, not their actual contributions. As a boss it's your job to change that — not just in private meetings or conversations but in public. Look closely at your team or organization to identify the biases that cause some people's work or ideas to be overvalued or undervalued. Then make sure that the right people are getting the right credit for the right reasons at the right time.[57]

Another important duty of the manager is to select the most appropriate candidates for vacant positions. When it comes to analytic, it is necessary to draw a Master or Postgraduate student who have received education about statistical analysis and quantitative methods, because a company that wins the analytical competition can be formed only by working with the best. For this reason, it is important to prepare appropriate working environment and create a motivating business environment and company culture in which works are appreciated.

- **Being Result Oriented**

One of the two kinds of thinking systems can be adopted to come through. The first one is to focus on the method and in this thinking style, the focus is on what is necessary to reach an objective. Because one has always tendency to choose the easy way especially in drudgery works in this situation, he/she does not do difficult but necessary works. For example, think we want to clean our house. The method-oriented person will think how boring this work is and think that first he/she must clean the floor, then dust the carpets and finally clean the windows. In result-oriented approach, because how to reach an objective is thought, the fastest way to reach the objective is chosen and because the result is focused, actions which will take to the result gain importance. If we discuss the same example, the result-oriented person will begin to clean his/her house by thinking that he/she must have a clean house, and because he/she focuses on the result, not things to do, and the result will be to get his/her house clean again, he/she will show much more performance and will do his/her work in the best way.

[57] WEB_26, Ben Dattner, (2012), Give Credit Where It's Due, HBR Blog Network, http://blogs.hbr.org/2012/03/give-credit-where-its-due/, 5/10/2014

The biggest difference between the method-oriented and result-oriented approach is flexibility. For a result-oriented person, things to do in order to reach the fruition are not important, but the important thing is the result, so he/she develops different methods and acts more flexibly in order to do the work. If the methods applied does not take to the result, this is not so much important for the result-oriented person. What is important is the result, so he/she is not afraid of changing his/her approach. His/her being undecided about how to do the work is out of question.

The employees should also be result-oriented to ensure that the company gets the leadership in business world. In such organizations, persons who focus themselves on reaching a certain result determined in the part where the organization serves can be leaders. For example, a person is responsible for web metrics of the company, he/she can set target such as raising the number of pageviews and time people spend for each page. If he/she works in a supply chain, he/she can aim at ensuring that customers can reach all products with minimum stock rate. Thus he/she sets decreasing in stock rate as a target. In the companies which adopt analytical and result-oriented management idea, promotion of persons who begin to achieve the objectives set enables the organization to progress and increases the motivation of the employees.

- **Being A Good Teacher**

As William Arthur Ward says: "The mediocre teacher tells. The good teacher explains. The superior teacher demonstrates. The great teacher inspires." The best analytical leaders are people who love to work with other people. They show patience to apply the analytical perspectives to the business. They do not only love teaching people something, but also mentoring them. Sometimes they directly teach their employees the analytical methods, sometimes they only encourage them to think and decide more analytically. As a result, the analytical abilities of their employees raise and if you are a really good leader, these employees do not realize that you teach them, but they think that the improvement of their abilities is completely their own achievement.

- **Determining Strategy and Performance Expectation**

In fact, in a poll about what makes a bad boss – bad, the majority of respondents said that their manager did not provide clear direction. This factor affected their sense of participation in a venture larger than themselves and their feelings of engagement, motivation, and teamwork.[58] After determining what we try to manage and which objectives the analytic will reach us, we should determine metrics in order to measure the manager performance and create the structures which will perform the following duty related to these metrics. Determination of these metrics will push us to use the analytical tools in order to observe the performance of the employees and will be enough to take the organization to a more analytical direction. The employees need a strategy specified for their work, its functions within the organization and their department in order to ensure they know where and how to apply the analytic. Each employee should know his/her role and what is expected from him/her in order to act according to reality, or in other words results of the data, and reach to success. A well specified strategy and performance criteria increase the business happiness.

- **Looking for Leverage**

As we mention before, different companies try to be the best to catch an analytical competition advantage in different areas. While Netflix specializes on predicting which films people will choose and what they like and making suggestions, Pandora deals with music tastes. While the company of Harrah's Entertainment specializes on customer loyalty, WalMart benefits from the analytic in areas of supply chain and marketing. It is also used to price the progressive insurance policies. As you can see, there are different applications of the analytic in different departments and we mention only some of them here. Which one of these applications on different departments, functions and business will the leader choose? A good leader estimates where to make recruitments in the activity are of his/her company in order to get the highest income. He/she detects the works with which the highest benefit is provided because even a simple recruitment will repeat thousand times and grow like a snowball due to the leverage. For example, even the smallest

[58] WEB_27, Susan M. Heathfield, What's the Big Deal About Clear Performance Expectations? Clear Performance Expectations Enable Success, http://humanresources.about.com/od/teamworksuccess/qt/clear_expectations.htm, 5/10/2014

recruitment made in pricing area of retail sector raises as a result of thousands of transaction.

- **Patience**

"It is not necessary for all men to be great in action. The greatest and sublimest power is often simple patience." – Horace Bushnell. Patience is one of the virtues a good leader must have. Because changes made in decision systems, business manners, IT and culture do not occur in one night. All of them are processes which need time. For example, the duty of providing the consistency of the data which we have mentioned before sometimes may take years, and as we progress in analytical way, it is inevitable that recruitments are made in algorithms and systems and the analytical approach is reviewed and enhanced because the managers and employees of our company apprehend the work better. For this reason, a good analytical leader must be patient. Zappos, online shoes retail chain, for example, is a company that has specialized in customer relations. When the CEO of the company, Tony Hsieh, was asked why other companies were not successful like them in this field, his answer was: "Patience, most firms won't put in the time to build employee morale and customer service. It's whether you're willing to make that commitment[59]" A leader who wants to stand out really must avoid impatience. To get today's popularity and form its brand took time for Zappos, and the result of this patience surely turned back as increase of the sales and high customer satisfaction.

- **Creating an Analytical Ecosystem**

The analytic is one of the current issues of today, and discussions in the companies are no more in the line that whether we should add the analytical functions to IT or not. It has turned into how we can use the analytical opportunities in the best way. Companies has begun to make decisions between "Should we be an analytical competitive?" and "Or should we use the analytic to protect our market position by making better decisions?". There is not only one way to create an analytical organization, but there are alternatives more than one. Each model has its own pluses and minuses. The analytical leaders rarely

[59] WEB_28, International Business Times, (2014), http://www.ibtimes.com/exnet/four-reasons-why-you-need-patience-right-now-797121, 5/10/2014

try to form the analytical capacity of the organization on their own. Instead, they establish a structure including mostly senior executives, employees, business partners and companies from which they make outsource and they use this structure in order to support abilities, tools to be used and solutions. The leaders should keep in mind that no matter what the model is, it will change in time and so it is necessary to form a model by thinking about the future of the organization.

There are various parameters to measure how successful an analytical organization is, and these can be ranked as how well the leaders are supported analytically while making decisions, how successfully the analytsts have an exchange of ideas with each other and cooperate, how obvious the analytic is within the organization and how easily it is used to contribute to the decisions, whether standard approaches, tools and business processes are formed or not, how effective sources spent for the analytical solutions are and whether any system is formed to measure the analytical capacities or not. Because each organization has different priorities, the formation of different structures is inevitable. For example, while placing the analysts in the departments to support the decision processes of the managers in the best way can be a good decision, it will be difficult for these analysts to share their ideas and work on the projects together because these analytsts who are distributed to these departments form a noncentral structure.

As we mention before, these structures should not be considered as permanent within the organization and can be changed in time by the leaders in accordance with the needs and expectations of the company.

- **Knowing the Limits of the Analytic**

The qualified analytical leaders are people who know when to use instincts. We have previously mentioned that the CEO of Amazon, Jeff Bezos, presented the feature of search inside the book by trusting his instincts because he had not any chance to test it. Great natural disasters or sudden fluctuations in economy can be shown as examples to the unpredictable incidents called black swan in the statistics. To use the analytic against these incidents which will change the business style and customer value of such an enterprise or

to think that models established before will operate in the same successful way is not right. The best analytic leaders are people who use the analytic in every situation, but also interpret the big picture and be aware of the need for human brain in moments of radical changes, so in short who knows the limits of the analytic.

3.4.2. The Analytical Strategies of Leadership

In this part, I will mention about the change of the organizations in the leadership environments according to the stages.

1. Stage 1 to Stage 2

Although the analytic leaders are uncomfortable because of the analytical blindness of the organization at this stage, they cannot make strategical decisions because they are in lower steps of the organization. In order to carry the organizations of Stage 1 to Stage 2, the analytical leaders should come up or persons who have these competences must be employed. At this stage, the analytical leaders do not have to raise their voice within the organization, but they should initiate the analytical projects and the analytical projects made should have non ignorable objectives.

2. Stage 2 to Stage 3

The organization is analytically willing at this stage. Behaviors and attitudes of the managers should support and encourage this wish. At this stage, these wishes should be directed to be useful for the whole organization, rather than to develop a special function that will constitute the base of the analytical competition. For this reason, the leaders involved in this stage should be people who are head of the functions important for the organization or senior executives who are in a position to see the organization as a whole and make decisions.

The goal of the leaders at this stage is to create a vision about how the analytical approach will change the business and inspire to ensure that the organization is more analytical. In addition, this vision created forms an outline to coordinate different projects in the future.

3. Stage 3 to Stage 4

Plans made in Stage 3 are applied at this stage. The leaders focus on the analytical projects and substructure that will support them. The senior executives begin to push the organization for a management based on the data and reality and place this within the organization culture. At this stage, there may be also other cultural values of the organization; for example, innovation may be stil the most important strategical directive, but the appearance of the analytic gradually begins to increase.

At this stage, IT and CIO, head of the information substructure of the company, has started to establish necessary technology and substructure, and human resources have begun to employ people who can think more analytically and applications based on deparment developed in the previous stage has been evolved to the projects which are cross-functional serving within the organization. The analytic becomes the main competition strategy of the company at this stage.

4. Stage 4 to Stage 5

Passing to Stage 5 after Stage 4 is inevitable. At this stage, the analytic becomes visible for the shareholders and employees of the company and the world. At this stage, managers who deal with the analytical activities should express the studies in the best way and be people whose communication skills have improved and ability of persuasion is high. The leader should always review the analytical approach of the company and struggle to vary and expand his/her analytical abilities.

3.5. Target

All enterprises can avail themselves of the analytical approach one way or the other. It can be achieved by understanding the customer such as Netflix or Tesco better and offering the most appropriate services and products, and by usage for operations like finance, marketing supply chain etc. or to support the decisions of the managers. However, even the analytical companies which are at the top of the analytical hierarchy we call as Stage 5 should set a target with which they will use their analytical capacities and can get the

highest benefit by distinguishing from their rivals. Because one should not forget that all analytical opportunities do not benefit in the same degree and companies have limited sources and abilities.

The priority for the companies which try to pass to the analytical approach should be to choose a certain problem. This problem may be the customers who cannot reach what they search because of the deficiencies in the distribution network and who complain about the deficiencies in service and product quality, or it also may be a process that is detected as a result of performance test to waste the sources and be infertile. Maybe one of the companies in the sector may carry the competition to a different level with a new approach and our company may try to adapt to the new situation by using the analytic. For example, the above-written Styleseek web site was a company which developed an analytical approach in fashion industry and specialized to present the most suitable products for its customers' taste. The entrance of this company to the market may force other e-trade sites in the same sector. Likewise, the entrance of Netflix to the market drove Blockbuster to the bankrupt.

For instance, the area in which Marriott, the global hotel giant, firstly used the analytic has become the income management. J. Williard Marriott, its founder, started to price according to the numbers of cars in the parking lot of the hotel and this approach has evolved to an analytical system that is used in determination of the optimum price for the rooms of the hotel. If Marriott can correctly make pricing necessary to fill all rooms of the hotel, he can avoid high prices which will cause the rooms to remain empty and low pricing which will cause losing money.

As Marriott's experience about the analytic increases, the areas in which he performs income management has expanded to the areas such as restaurant and catering service, and as he has been more successful, his objectives has become wider and more strategical. After he gains an analytical specialty on a subject, he has made for other areas. For example, it has been possible for him to present different offers and campaigns by intending on the most profitable customers due to his Marriott Rewards program and to use the online channel more effectively due to web analytics softwares. It is important to be innovative in

the sector by optimizing the key business processes in time and win the customers' approval. If the companies which reach the Stage 3 did not achieve this previously, they should focus on the business processes which will create a competition advantage for the company at this stage. These different business capacities which provide competition advantage for the company and business styles integrated to each other are bases of the organization success and constitute the most important objective. Marriot, for instance, firstly focused on the income management, and then he has started to use this specialization he gained in this field in restaurant and catering services.

Objective choice is very important for the organization, so opportunities provided by the objective to the organization should encourage the top management to attend the process and it is necessary to ensure that the labour force, money and time which the organization needs to progress along the process are transferred. The information obtained as a result of studies made should also raise comprehension related to the business and so, we can perfect our algorithms and way of thinking by optimizin them again and again as we progress in the analytic. The data related to the objective chosen should also be accessible and the objective chosen should not be an unreachable objective that is over the capacity of the organization. For instance, the mission statement of Walmart, the global market giant, is: We save people money so they can live better."[60] And the main competition element of the company is on achieving the lowest operation expenses and thus providing its customers with the lowest prices. Its achievement of this owes to a system that minimizes storage costs and in which the goods reaching the warehouse are packed again and directly shipped to the stores, which is called cross-docking. Cross-docking enables Walmart to achieve the economies that come with purchasing full truck-loads of goods while avoiding the usual inventory and handling costs. Walmart runs a full 85% of its goods through its warehouse system –as opposed to only 50% for Kmart. This reduces Walmart's costs of sales by 2% to 3% compared with the industry average. That cost difference makes possible the everyday low prices.[61] Walmart saves from its promotion budget by offering the lowest price and the

[60] WEB_29, Walmart, http://stock.walmart.com/faqs/, 5/11/2014
[61] Stalk, G., P. Evans & L. E. Shulman, (1992), Competing on Capabilities: the New Rules of Corporate Strategy. Harvard Business Review. 70 (March/April), Boston, USA, p. 58

stable price eases the transaction related to the supply by also easing foreseeing how many products will be sold and increases the sales by drawing more customers to the store.

In this part, we will talk about how to find the points in which our company gets the competition advantage and distinguishes from the industry and how to develop our analytical abilities related to the differentiation advantages we found.

3.5.1. Finding Differentiation Points

"No wind serves him who addresses his voyage to no certain port." (Montaigne) Some organizations are like this. They want to seize every opportunity they see, but because their effort is generally canalized to wrong direction or used in a wrong way, it cannot meet the needs. What is right is to use the opportunities in accordance with an objective.

Strategic planning is an organization's process of defining its strategy, or direction, and making decisions on allocating its resources to pursue this strategy, including its capital and people. Simply put, strategic planning determines where an organization is going over the coming years and how it is going to get there.[62] Thus the strategical plan of the company shows where the company tries to reach in terms of finance, customers, employees and operations, and leads us about which area we should be more analytical to get the biggest benefit. However, though the strategical plan shows us which areas are important for us, it does not give information about which activities in this area constitute the analytical objectives. For this reason, many organizations examine the business styles of the companies in the industry and try to get an idea, so that changing and increasing needs of customer have been met by adapting the rivals.

It is a fact that we can only reach the same point with our rivals and protect our performance by looking and imitating the analytic usages only in our own industry, and we should be creative in order to go beyond and be a company that stands out and directs the industry. The analytical competitive companies in Stage 5 of which analytical success we have mentioned and showed as an example in their sectors so far are in this position

[62]J. Scott Armstrong, (1986), The Value of Formal Planning for Strategic Decisions: A Reply, Strategic Management Journal 7 ,p. 183–185

because they succeed things different from their rivals. For example, Netflix distinguishes from the companies like Blockbuster in the sector due to a suggestion engine that suggests films by analysing the customer tastes. Likewise, Harrah's Entertainment distinguishes by caring customer loyalty in order to correctly use the present assets instead of investing on new casinos like other companies in the sector. While the Marriott, international hotel chain, distinguishes by making dynamical pricing according to the occupancy rates for its customers by making an analytic revenue management in his sector, Walmart has become the company that uses the cross-docking approach for supply chain in the most effective way in retail field.

Although the first table below is quite limited, it shows the analytical applications in different industries. The second table shows what applications can be for different business units. It is limited, but possible to understand which trends there are in our industry and in which way the customer expectations are, but what is the most important is, as we mentioned before, not to apply what is there, but introduce what is not there into the sector

Table 3.5.1 Common analytical applications

Common Analytical Applications

Industry	Analytical Application
Financial services	Credit scoring, fraud detection, pricing, program trading, claims analysis, underwriting, customer profitability
Retail	Promotions, replenishment, shelf management, demand forecasting, inventory replenishment, price and merchandizing optimization
Manufacturing	Supply chain optimization, demand forecasting, inventory replenishment, warranty analysis, product customization, new product development
Transportation	Scheduling, routing, yield management
Health care	Drug interaction, preliminary diagnosis, disease management
Hospitality	Pricing, customer loyalty, yield management
Energy	Trading, supply, demand forecasting, compliance
Communications	Price plan optimization, customer retention, demand forecasting, capacity planing, network optimization, customer profitability
Services	Call center staffing, service/profit chain
Goverment	Fraud detection, case management, crime prevention, revenue optimization
Online	Web metrics, site design, recommendations to customers
Every business	Performance management

Source: Thomas H. Davenport, Jeanne G. Harris, Robert Morison; "Analytics at Work: Smarter Decisions, Better Results", Harvard Business School Press, 2010 p.76.

Table 3.2. Department specific analytical applications

Sales	Service & Contact Center	Marketing	Order Management & Fulfillment	Supply Chain	Financials	Human Resources
Pipeline Analysis	Churn Propensity	Campaign Scorecard	Order Linearity	Supplier Performance	A/R & A/P Analysis	Employee Productivity
Triangulated Forecasting	Customer Satisfaction	Response Rates	Orders vs. Available Inventory	Spend Analysis	GL / Balance Sheet Analysis	Compensation Analysis
Sales Team Effectiveness	Resolution Rates	Product Propensity	Cycle Time Analysis	Procurement Cycle Times	Customer & Product Profitability	HR Compliance Reporting
Up-sell / Cross-sell	Service Rep Effectiveness	Loyalty and Attrition	Backlog Analysis	Inventory Availability	P&L Analysis	Workforce Profile
Cycle Time Analysis	Service Cost Analysis	Market Basket Analysis	Fulfillment Status	Employee Expenses	Expense Management	Turnover Trends
Lead Conversion	Service Trends	Campaign ROI	Customer Receivables	BOM Analysis	Cash Flow Analysis	Return on Human Capital

Source:http://bi-insider.com/business-intelligence/oracle-business-intelligence-bi analytical-applications/

3.5.1.1. Seeing the Big Picture

The big picture can be considered as an appearance of our business from top. It helps us know where we are and where we want to reach. It enables us to understand trends shaping our business. Let's mention and detail some of these trends from different perspectives together. For example, if we examine in economical aspect, the solar energy that was expensive once reaches a position to compete with the energy obtained from fosil fuels without any government contribution in sun-drenched regions such as Arizona and maybe Antalya from our country. This situation is the result of the obvious decrease of the prices of the solar energy panels in the last 15 years and it is a situation that will cause the industry companies which serve in the energy sector and of which dependence on energy is high to make different investments and will cause maybe unexpected acquisitions and amalgamation. Likewise, because knowledge is accessible everywhere and open to everyone today, the statement "If you want to find a good job, you should graduate a good

university." which was valid in the past respectively has remained in the past. As a result of this, a decrease may be expected in college credits in the economies in which the education is private such as America, and the financial institutions should consider this while planning about future. Because of the increased petrol prices and tax policies applied by the developing countries, people has turned to more economical cars and begun to drive less and use mostly transportation vehicles open to public. This trend will bring many changes with itself, and countries are expected to invest on transportation vehicles such as subway train instead of new main road investments. Likewise, automobile industry will center on economical vehicles which get more power with less volume instead of huge and powerful vehicles and r&d budgets will be spared for electrical vehicles instead of cars with fossil fuel. When we look at the demographical trends which will shape our business, for example, we can reach the data that America does not let in immigrants as in the past which is parallel with the developing Mexican economy in America, decreasing fertility rates and slowdown in the construction industry and that the immigration continues by increasing from the Asia countries. That bears repeating: On net, Mexicans are no longer moving to the United States at all. So who is? Lots of people, but Asians more than anyone. Asians are moving here at a rate of about half a million a year, and the Asian-American percentage of the population has already reached 6%[63] . This shows that the companies serving in America should increase their activities for the Asia culture. If we consider that immigration from the Asia includes people who have competence, we can predict that it will highly contribute to the American economy and increase its competition power in the international market. When we consider 2013-2075 population projections of the Turkish Statistics Institute, if the current trends of demographic indicators persist, the population of Turkey will continue ageing. Elderly population, which is the population at 65 years of age and over, is 5,7 million in 2012 with a proportion of 7.5% and this population will reach to 8.6 million people with a proportion of 10.2% in 2023.[64] Thus, governmental institution such as SSI and Social Security should constitute an answer to this coming burden and

[63] WEB_30, Noah Smith, (2013), The 10 Stealth Economic Trends That Rule the World Today, http://www.theatlantic.com/business/archive/2013/09/the-10-stealth-economic-trends-that-rule-the-world-today/280107, 5/12/2014

[64] Turkish Statistical Institute, Population Projections 2013-2075 , 14 February 2013

adjust their taxes according to this, and it can be foreseen that demands for different products to meet the needs of aging population will increase. When behaviours of the customers are examined, we can see that customers began to invest on the projects they like through sites such as Kickstarter, to work with the brands and that they participate in the production of the product more actively. Likewise, we can foresee that changes can occur in the market channels due to increasing usage of mobile.

In short, seeing the big Picture enables us to form an organization that provides the highest contribution in reaching the desired profits and keeps step with the changes. Thus, we can see how to increase the performance of the organization and what we have to differentiate. There are many frameworks and models to measure the performance of the organization and the question which model should be used depends on the nature of the organization and objective of the evaluation. It is important to note that different frameworks are underpinned by different philosophies and theories of organizational change; an organization should choose a framework that is congruent with its own management beliefs and culture, to ensure that it fully engages in the process and truly benefits from the assessment[65]. These frameworks generally aim at understanding how much these activities contribute to the product obtained by separating the underlying works of our organization to their subunits.

In any complex organization, there are innumerable 'things' that can be measured and studied. An effective assessment process focuses on those things that have the greatest impact on the way the organization functions[66]. The objectives which have high analytical potential vary according to the industries and the way the organization contributes to the market. For instance, value chains companies are production and distribution companies which turn the input into the products and they focus on business of the production, shipping and marketing of the product. For this reason, they can use the analytic in order to raise the fertility in their production processes, to maintain and meet supply and demand balance, to optimize the logistic chain and for distribution network. Value shops companies

[65] WEB_31, Betterevaluation.org, http://betterevaluation.org/theme/organizational_performance, 5/13/2014
[66] Kathleen M. Immordino, (2009), Organizational Assessment and Improvement in the Public Sector, ASPA, CRC Press, London, UK, p.12

are companies which try to solve specific problems by mobilizing human, money and knowledge, and their primary objection is to catch the opportunities in the market. Forexample, producing a new product such as a medicine, exploring new oil fields by making geographic analysis or making a tank that will help the army establish a superiority on its rival can be counted among these. These companies can use the analytic in order to evaluate the possible results by testing decisions, project management and different approaches. Value network companies, on the other hand, are composed of telecommunication, insurance and banking companies which give agency service related to the goods and services communicated and changed by the customers within their own network. They use the analytic in order to use the available network in full capacity and raise the numbers of their customers.

An analysis about how the companies similar to the one above add value to the sector in which they operate enables us to understand which group of company uses the analytic in which areas to create the biggest value. Thus, we can understand where to focus. For instance, if an institution serving for public health decreases the time spent for patients to raise the fertility of the hospitals available, this may cause a decrease in the service quality and long term uneasiness and finally management changes. In addition, because this analysis classifies the companies according to values they contribute, it also gives ideas about where to look for different analytical applications, and the best inspirations are possible between the companies which belong to the same class. For example, it is possible for the above-mentioned governmental institution serving for public health to transfer the analytical approaches which the companies use for customer satisfaction from these companies.

Apart from this, instincts have also role in choice of the area in which an analytic advantage can be obtained. For example, an idea that will add value to our business and we think important for our customers or an innovation that we have no idea about its applicability can be shown among these. For instance, when Netflix was established, its CEO had instincts about that people would receive the film suggestions online and give an

order via mail, but it was not possible to know that how right this instinct was till the idea was applied.

3.5.1.2. The Analysis of Business Processes

To see the big picture enables us to understand how concordantly the main business units work and the internal and external factors shaping our business. Examination of business processes try to understand in which business processes we can make the biggest contribution by using the analytic by discussing how the business processes work integrated with each other and how the decisions in these units are made by examining the main business processes.

Let's detail some of the business processes which we think will provide the biggest contribution from the analytic below.

1. ***Data-rich / Information-intensive***

The analytic will help about revealing and making sense of the potential of the data in the applications rich in terms of data. The summary of the business philosophy among the 6 sigma philosophy is: If you can't measure something, you really don't know much about it. If you don't know much about it, you can't control it. If you can't control it, you are at the mercy of chance. [67] Thus, we should measure the data obtained by our company from the business processes which are rich in terms of the data. So that the data we have turns into information and into the experience in the information, and the whole process can be made better due to the analytic.

2. ***Asset-intensive***

Let's first detail what "asset-intensive" means: There are a number of industries wherein the core business value proposition relies primarily upon the management of the capital

[67] WEB_32, Ashu Bhatia, (2005), Data Rich, Information Poor? Focus On Right Metrics, http://www.tdan.com/view-articles/5115, 5/14/2014

assets and thus we refer these types of business as "Asset Intensive" industries[68] We can show some public institutions distributing and enterprises serving in the fields of energy, oil and gas to these kinds of enterprises. The same situation is also valid for some departments and business processes. In these kinds of business processes, the analytic helps us about how to use sources which are expensive, beyond reach and require great capital to obtain more effectively.

3. Labor-intensive

This is a process or industry that requires a large amount of labor to produce its goods or services. The degree of labor intensity is typically measured in proportion to the amount of capital required to produce the goods/services; the higher the proportion of labor costs required, the more labor intensive the business[69] Labor intensive business helps to ensure that the employees use the analytic in the most effective way and the labour force can be continued by making supply and demand analysis in the enterprises in which the demand changes in periods.

4. Speed and Consistency

The analytic provides the speed necessary for purchase and sale processes which should be made in real time such as algorithmic trading. In the processes in which we should act quickly such as fraud detection, for example, tracking of the doubtful account activities enables superhuman speeds. In customer relations, it helps to make the most correct decisions for each customer in the fastest way.

Likewise, the analytic ensures that decisions made are consistent. It is a necessity with this characteristic in some sectors like banking in which one should be sure that everyone is equally treated legally.

[68]WEB_33, JD Edwards Portal, http://www.go9withjde.com/en/jd-edwards-by-industry/asset-intensive, 5/14/2014
[69]WEB_34, Investopia,http://www.investopedia.com/terms/l/laborintensive.asp, 5/14/2014

5. Decentralize decision making

Corporations are blessed (and cursed) with ever increasing amounts of rapidly changing data, decision-making can no longer be limited to the executive suite or any one business unit or group in the firm. Companies can no longer allow information and data to be locked in silos (or desktops or laptops or even flash memory). Today, more than ever before, there is a need to distribute information in a timely manner to the most appropriate individuals in the corporation as well as to the extended business ecosystem[70] In short, the complex organization structures make it necessary that the employee who is well-informed should make some decisions by himself. Thus, this raises the motivation of the employees and ensures that many persons spontaneously work on a problem and the organizations are more flexible. However, it is possible that the employees may exploit the noncentral decision making mechanism. The analytic helps decision-makers to foresee their influence on persons who are in top and lower position in the organization structure of the decisions. In addition, it becomes possible to measure how consistent the decisions are with the organization strategy.

6. Unproductive Processes

The analytic reveals the unproductive business processes of which performance is low, so we can overcome the problems by looking at these processes more closely.

In addition, one of the areas in which we can use the analytic is decision making processes. The decision-makers can make better decisions by looking at and examining the data in their hands from different perspectives before making any decision and the decisions they make as a result of more detailed analysis contribute to the profitability of the company. Then how can we detect in which areas the analytical recruitments in the decisions made take us to the best results? You can find some of the situations which will provide the biggest benefit from the analytical recruitments to be applied on the decision making processes below.

[70] Timothy Bevins and Naumi Haque,(2010) ,Data Enabled Collaborative Decision-Making: A Guide for Next Generation Enterprise Decision Processes, p.16

1. Complex Systems

These are the processes which require to examine the parameters coming from many systems in order to make a decision. Visual Analytics methods allow decision makers to combine their human flexibility, creativity, and background knowledge with the enormous storage and processing capacities of today's computers to gain insight into complex problems[71] in today's world in which the data is produced in an unbelievable speed and the capacities of collecting, storing and analyzing the data increase with the new solutions.

As mentioned above, the Visual analytics methods are just one of the tools provided to us by the analytic in order to overcome the complex systems. You can find a graphic about how to apply the method below.

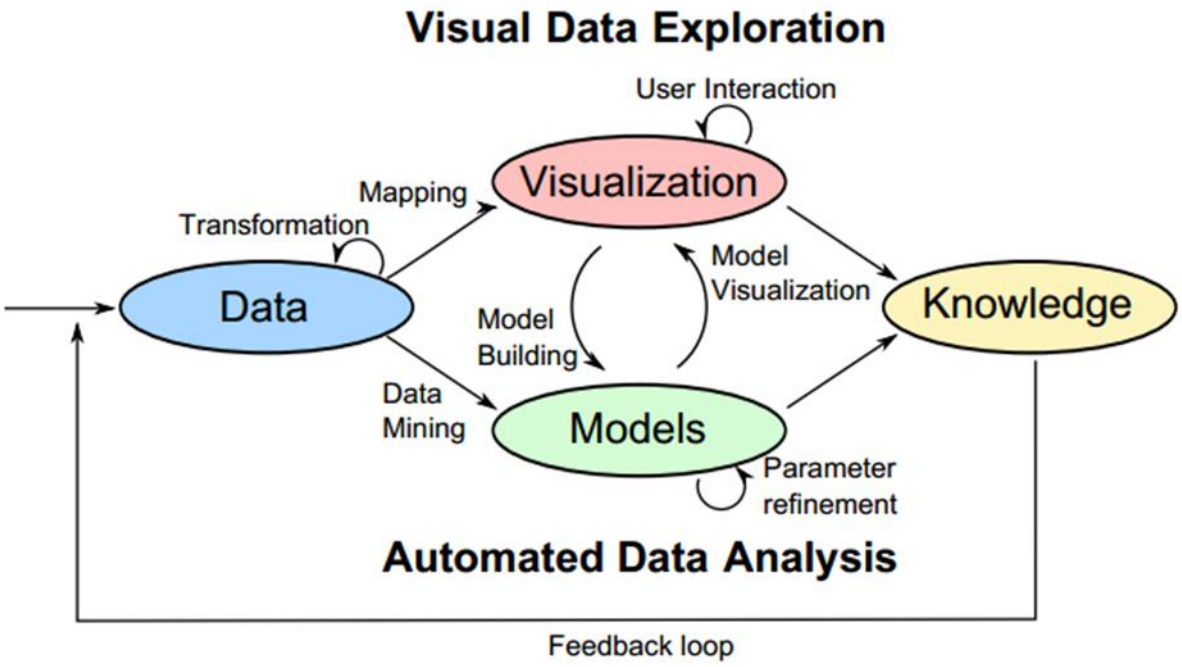


Figure 3.3. Visual data exploration

Source: Daniel A. Keim, Florian Mansmann, Daniela Oelke, and Hartmut Ziegler, "Visual Analytics: Combining Automated Discovery with Interactive Visualizations", University of Konstanz, Germany, 2008, p.5.

[71]WEB_35, Visual analytics portal, What is visual analytics?, http://www.visual-analytics.eu/faq/, 5/15/2014

1. Bureaucratic/Standard Business Processes

These processes are processes which are regularly performed and systematized within the organization. They include many steps and are well-documented and consistent. In addition, the consistency of the decisions made within these processes may be legally obligatory in some sectors. For example, the detection of any discrimination while making credit decisions may cause some serious punishments in the banking sector. We have talked on the metrics used while giving credit before, and these metrics are transparent in many countries and persons who will use the credit can learn his/her credit scores.

2. Processes Requiring to Discuss the System as A Whole

All of us have visited the burger chains. We have witnessed that many people send their friends or children to hold a table for them while they are waiting on a line for meal in times especially when occupancy rate is high. However, we see that as a result of this behavior, most of the tables are held by people who wait on the line and full although they do not eat. For this reason, it is possible for you not to find any table to sit even if you are at the very front of the line. However, if people who take their food occupied the tables, your possibility to find an empty table would be higher because when you take your mail, the others will have finished their meal and stood up. As it is seen, this selfish attitude of people destroys the whole system and sometimes this situation is not different in the enterprises.

In one of the companies for which I consult, for instance, the sales team still continued to make sale in order to raise its own performance although the production quotas of the company was full and this caused that customers who could not receive their orders gave up working with the company. Although the high sales seem like pride and success for the sales department in the short run, the sales will be undermined because of the dissatisfaction of the customers in the long run and as a result, the whole enterprise will come out a loser from this situation. When you look around, I am sure you can see the departments assessed according to one another, police officers subjected to performance

assessment according to the number of their fines and doctors assessed according to the number of patients they examine.

For example, which students would pass or fail according to their grade average was determined in one of the school I studied, but as you will immediately realize, while somebody wins, somebody always has to lose in this system. We can detect the situations in which to optimize only one process by using the analytic will destroy the whole system and optimize these processes by seeing these processes which are interrelated and connected to each other as a whole.

In addition, we can see where we are better and where we are open to develop by using the analytics question matrix. Thus, target selection gets easier. An example that the analytical matrix is applied on the supply chain is given in the graphic below.

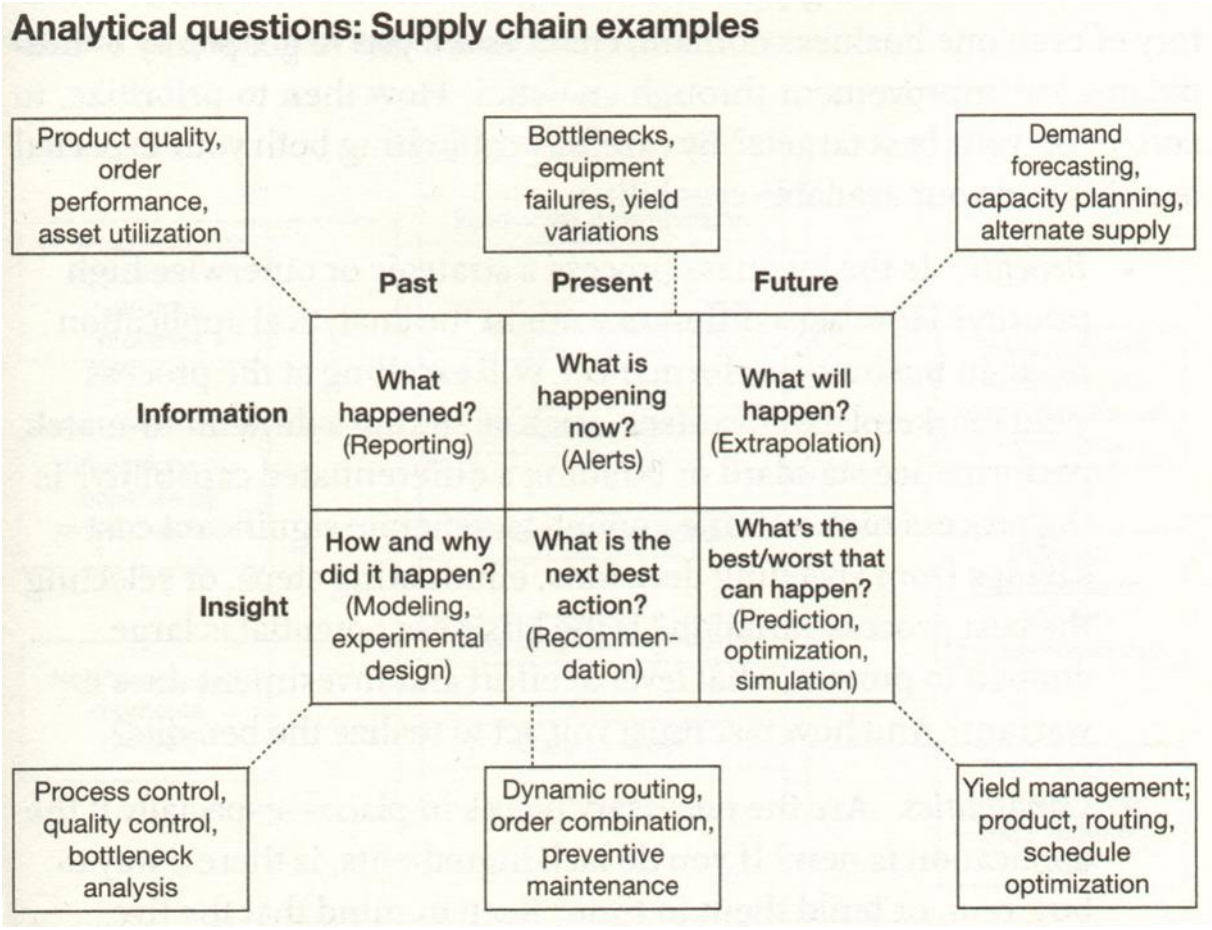


Figure 3.4. Analytical question matrix

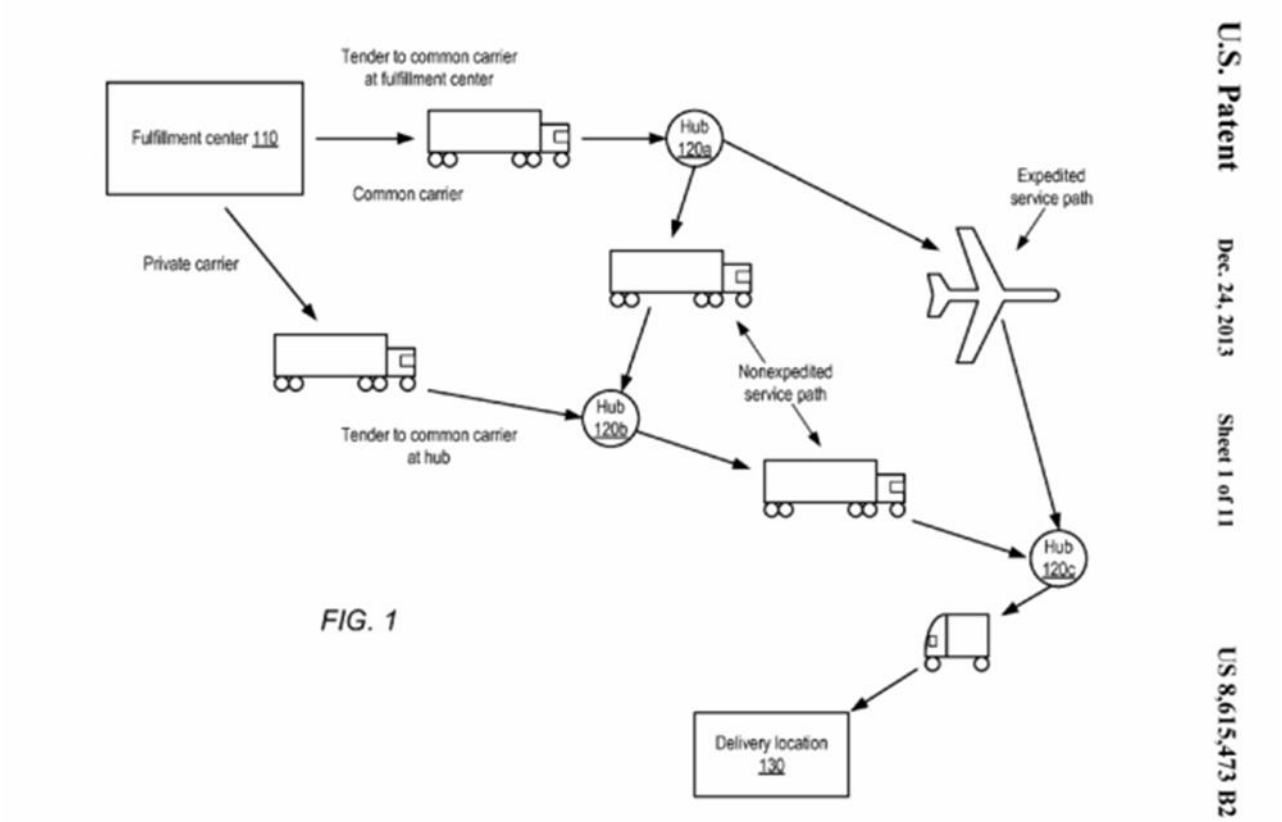
Source: Thomas H. Davenport, Jeanne G. Harris, Robert Morison; "Analytics at Work: Smarter Decisions, Better Results", Harvard Business School Press, 2010 p.81.

All enterprises should give answers to some questions about the business. Our above example has been prepared by considering that we give answer to some main questions about the supply chain. As you can see, for which time period the questions will be answered is included in the x axis of our two-dimensional matrix, and why the events happened in accordance with the knowledge we have is included in the y axis.

The questions to be answered by the information line about the past are questions which can be answered with the reporting function evaluated within the analytic by some writers. For instance, the product quality and order performance in our supply chain example can be answered by examining the data obtained. The alert function answers what it is at the moment, and we can ensure by applying some basic rules related to our business that the system will warn the decision-makers when one of the systems gets out of the normal working routines. It enables us to understand when there occur any bottlenecks in the system and any problem in one of the equipments working inside in our supply chain example. Extrapolation helps us to create some phrases about the future by looking the incidents in the past. For example, how the product demands for supply chain will change and how to plan the capacity can be shown among these.

The questions in the insight line comprise of the questions which can be answered as a result of detailed examination of the information obtained. For the insight about past can be answered by forming statistical models and they help us to understand why and how the incidents in the past happened as mentioned. In the supply chain example, the control of the processes can be done in order to understand why and how the changes in the product quality occur and modelling of the quality and processes causing bottleneck can be made in order to understand why and how the changes in the order performance. The insights dealing with now enable to receive suggestions such as reducement of the transportation

costs with the product inducements which will be made momently in the supply chain and making machine maintenance to prevent problems by foreseeing them. In the last column of the insight, there is information obtained by using prediction, optimization and simulation about the future. For instance, Amazon works on a system that will make the future shipments possible with the insights it obtained. Amazon has filed a patent for a shipping system designed to cut delivery times by predicting what buyers are going to buy before they buy it — and shipping products in their general direction, or even right to their door, before the sales click even (or ever) falls[72]. The patent received is based on the fact of shipping of the items which the customers will probably order to their geographical region and exact determination of the arrival address while the packet is carried. A graphic about the operation of the patent by the Amazon is below.



[72] WEB_36, Natasha Lomas, (2014), Amazon Patents "Anticipatory" Shipping — To Start Sending Stuff Before You've Bought It, http://techcrunch.com/2014/01/18/amazon-pre-ships/, 5/15/2014

Figure 3.5. Amazon yesterday shipping patent

Source: Natasha Lomas, "Amazon Patents "Anticipatory" Shipping — To Start Sending Stuff Before You've Bought It", Jan 18,2014, <http://techcrunch.com/2014/01/18/amazon-pre-ships/>

3.5.2. Choice of Differentiation Point

We have mentioned about seeing the big picture and analysis of the business processes and explored the areas open to the analytical recruitment in our company with these methods so far. After this point, we will mention about the benefits these areas provide us and in which order we can climb the recruitment steps by regarding the ability of our company.

First, we should make an analysis according to the contributions of the analytical recruitments we will make. The first one of these is how strategical the decision we make is and its urgency. For example, the strategy for a company serving in tourism and accommodation sector can be considered as analytical recruitments of the questions such as the locations of the new hotels and income obtained from each room in accommodation places. Secondly, how sustainable the competition advantage will be provided by the analytical recruitments made has importance. Progressive Insurance, for example, has used the advantage of being the first company to use credit scores in the sector and of customer segmentation works as well as many innovations it made, and it has doubled its own profitability by providing the opportunity of lower policy price for certain customer segments when compared to its many rivals and reducing its expenses. Likewise, Kroger serving in the retail sector has got the opportunity to learn more details about why the customers attending the loyalty program bought which product as a result of the agreement with Dunnhumby. The data strategy works for Kroger. The grocery chain's most recent earnings report showed a 6 percent rise in revenue, while competitors Safeway and

Supervalu Inc. fell 1 and 9 percent, respectively.[73] In addition, the sufficient greatness of the business process recruited has importance and even the smallest recruitments in the business processes which repeat especially thousands times every day will increase the profitability in a high level.

We should not forgat that we must also regard the ability of our company apart from the analysis according to the benefits provided to the company which we mentioned above. All of the Analytical Delta factors are connected to each other and the Target factor is a factor that is affected by the other factors at most. First, the company should supply the data on a certain quality including the needed information to reach the goal chosen by buying or establishing the necessary systems. To provide the analyists who can make required analysis on the data from or outside the company, to have adopted the enterprise wide analytical approach necessary to ensure that the analytical activities do not remain on the level of single person or department, to establish supporting systems and provide the leader support necessary to ensure to use necessary money, time and people to reach the goal are necessary to reach the goal chosen.

3.5.2.1. The Analytical Leader

The ideal one to show how much we have progressed in our objective is to use the structure we call as the analytical ladder. The higher we climb in this ladder, the more our analytical abilities get complexed and our competition strength increases.

Let's detail what each step of the below analytical ladder means together.

There is the data at the lowest step. As we have mentioned before, the companies cannot be analytical without the data to conclude by examining. This data must be the highest quality for intended use and consistent and meaningful and integrated to each other. To make it interrogable with the establishment of necessary IT structures other than this has also importance.

[73] WEB_37, TIBCO Spotfire's Business Intelligence Blog (2010), Acting on Data Analytics – More than Food for Thought, http://spotfire.tibco.com/blog/?p=4236, 5/15/2014

At the second step, it is important to separate the data obtained into segments as a result of statistical examination. For example, we can obtain homogeneous subgroups which show the same actions with each other in a nonhomogeneous market by separating into the customer segments.

At the third step, there is the differentiated action and this is the part in which we develop different actions from the data we segmented when compared to these segments. For instance, our customer can be separated as tidy ones, married ones, single ones or according to their age groups and they can also be separated according to their purchase actions or different criteria. This step is the part in which we define the customer segments and develop different actions for different segments.

At the fourth step, there is the predictive action. We try to predict the answers of the segments to the different approaches applied in the differentiation step by our company here. For example, the customers who reduce their spending of credit cards can be regained by offering them different campaign regarding that they may give up working with our company.

At the fifth step, there is the institutional action. We integrate the results we obtained from the segmentation and predictions into the business processes of our company at this stage. It is wide scale like the systems automatized according to which customer segments receive which offers and to their reactions.

In the real-time optimization that is the sixth and last step, there is an analysis of real-time customer actions and which offers will provide sales. The most appropriate answers are produced at this stage.

The analytical ladder steps are shown in the below image.

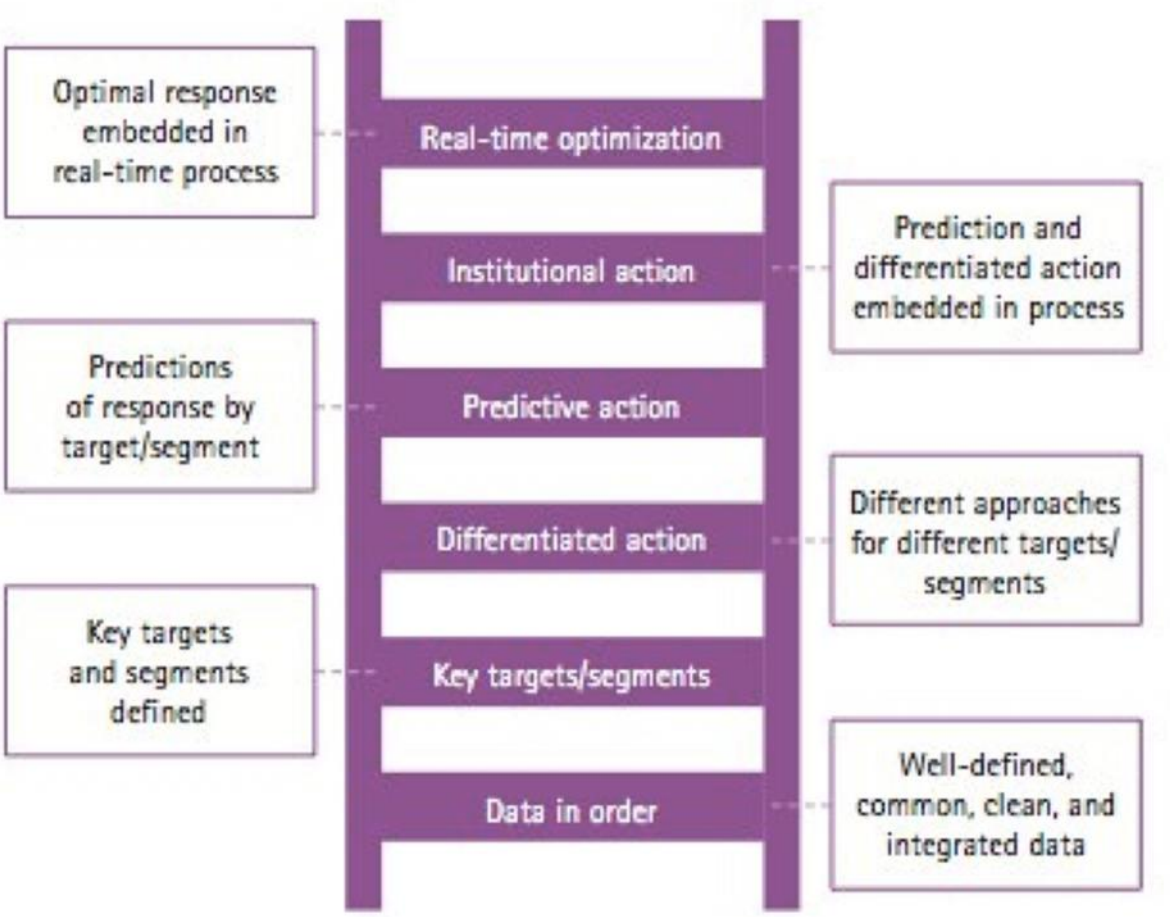


Figure 3.6. Analytical ladder steps

Source: Thomas H. Davenport, Jeanne G. Harris, Robert Morison; "Analytics at Work: Smarter Decisions, Better Results", Harvard Business School Press, 2010 p.83.

I believe that to examine the analytical steps on a real system at this point will ease understanding. The systems we have mentioned so far were generally systems of supply chain, finance and customer relations and we gave examples of the analytical usage in these fields. I think that to show the analytical steps on a different field which the data can analytically use here will draw attention. This field is the human resources management. Although human resources specializes on how often the employees circulate, the cost of each employee for the company, how beneficial the training programs organized for the

employees will be for them and develops certain metrics in many companies, it still remains insufficient to measure the contribution of the abilities the employees have in the company performance. Marketing, finance, and most other functions have well-developed methodologies for generating the information managers need to make strategic decisions. HR, however, often focuses principally on its own performance. It's time for HR to shift its focus from what it does to the quality of the talent decisions it supports[74] In today's knowledge economy, maybe the most valuable thing is the value that knowledge and employee abilities add to the company. Some of the biggest companies today are valuable due to their employees, not their wealth. Microsoft, Oracle, Apple, Cisco are just some of these. Thus, to measure the value that the abilities of the employees add to the company has become a necessity for many companies today.

Fortunately, various analytical approaches have made it possible to measure the contribution of the human value that the above-mentioned companies and many others have in the financial performance of the company. HR's primary task has evolved from that of "personnel control" to "people developer" and now to "talent multiplier," it has become increasingly important for HR to show that its investments improve the bottom line[75] According to the research made by the Accenture, successful companies are the companies which use the analytic for human resources to measure the contribution of the employees in the company performance. 78 percent of companies that are leaders on human performance criteria are able to demonstrate with quantitative measures the impact of the performance of the top three workforces on the organization's overall financial performance; only 49 percent of laggard companies can do so. Similarly, 35 percent of the leaders (but only 19 percent of laggards) have formal, business-focused metrics to gauge the impact of all of their HR activities on workforce performance.

I present the diagram in which the analytical HR methods are ranked from simple to complex with the method of the analytical ladder below.

[74]John W. Boudreau and Peter M. Ramstad, (2005), Where's Your Pivotal Talent? , Harvard Business Review
[75] Elizabeth Craig, Robert J. Thomas and Chi T. Pham, (2008), Multiplying Talent for High Performance, Accenture Institute for High Performance research report, April 2008.

The first step is the data. As we have mentioned before, a correct, complete and accessible data that can serve the purpose is valuable for all analytics processes and it has also importance to understand the potential of the human resources. Apart from this, to structure the human resources database to reflect only one truth that is comprehensive and will be valid for the whole company is also important.

For instance, Google which is among the top 10 of the biggest companies in the world by 2013 has regarded the traditional numbers such as GPA of the candidates in order to select the most appropriate and successful candidate for the job. Although it firstly seems sensible for a company like Google to which thousands of candidates apply every month, they could not measure the correlation between these traditional metrics and business performance. For this reason, they made a research that they called as project oxygen in order to select the best leaders and analyzed reams of internal data and determined that great managers are essential for top performance and retention. It further identified the eight characteristics of great leaders. The data proved that rather than superior technical knowledge, periodic one-on-one coaching which included expressing interest in the employee and frequent personalized feedback ranked as the No. 1 key to being a successful leader[76] Likewise, it becomes possible to enter the available employee data into the company database according to their actions, situations, attitudes and experiences, to understand some connections between the performance of the working employees and that of persons who will be newly employed as a result of performance matches, to reveal the characteristical features of the successful employees and to use this in new recruitments. This analytical approach that Google uses in its human resources has enabled a working environment in which there is a constant innovation, which many companies envy.

The second step of our ladder is the segmentation. We can segment the candidate as the ones who have the key abilities for the company, the ones who will show the best performance etc. by using the analytical methodology. Thus, we stay one step ahead of our rivals about selecting the persons who will contribute at most in the company profit and it

[76] WEB_38, Dr. John Sullivan (2013), How Google Is Using People Analytics to Completely Reinvent HR, http://www.tlnt.com/2013/02/26/how-google-is-using-people-analytics-to-completely-reinvent-hr/, 5/16/2014

becomes possible for us to use our capital we spend to find, maintain and train the talents in the most effective way.

For instance, as we all know, the talented athletes are paid much and the greatest expense of a team includes salaries it pays to the sportsman and transfer fees in the sport field, just like in software companies. For this reason, the biggest worry of the teams is to optimize their investment on the talent in the best way. As a result, any team does not want to take a risk that the sporter it invested for millions of dollars cannot play because of an injury and not only the ability, but also the health and endurance of the sporter are important in selection of players. It becomes possible here to examine the performance data showed by the player by using the analytic as some sport teams do and to form segments such as sportsman with high performance, the ones who are strong and sportsman who are both strong and of high performance as a result of the detailed analysis of their actions.

At the third step, the actions which will be developed according to the segmentation made are mentioned. Although the study of segmentation does not exactly classify the employees, it constitutes a base to determine how to behave the employees at least. As we target the customers according to their purchase actions in customer relations management, we also target elements and groups which are the most valuable for our company here.

For instance, marketer and distributor of foodservice products Sysco from the North America, which is among the Fortune 100 companies with its wealth over 36 billion dollars, with its hundreds of units moving autonomicly and full-time employee more than 51 thousands, began its workforce analysis with three gross measures for each operating unit: work climate and employee satisfaction, productivity, and retention. It has drilled deeper to understand, measure, and manage seven other dimensions of the work environment, including frontline supervisor effectiveness, diversity, and quality of life[77].

As a result of the analysis made, they have detected that employees having a high business satisfaction help the profitability and costs of the company and provide customer loyalty and found an opportunity to measure what kind of management idea will motivate

[77] Thomas H. Davenport, Jeanne Harris and Jeremy Shapiro, Competing on Talent Analytics, October 2010, Harvard Business Review

the employees and increase the business satisfaction and in which degree this approach will affect the company profitability. Thus, they have had the chance to take the most correct actions.

At the fourth step, there is the predictive action. Forbes chooses the best workplaces to work in America every year. Imagıne a world in which all enterprises would rank among the best places to work. It would be completely different. However, there is a market in which employees often change job and there is a great competition for talented people. In this situation, to understand why the employees want to continue working in our company or to leave their job has a critical importance. It is necessary to understand the preferences of the employees and analyze the reasons of preferences in order to understand this. For example, when we look at the working environment of Google that has managed to rank among the best companies to work in a short time, the extra opportunities it generously provides for its customers such as free meal in 11 gourmet restaurants, free fitness centre, free hair cut service, car wash service, billiard saloon, pool within the company, massage service, permission to bring their pet with them are just some of the reasons to be selected as the best company. However, the main reason underlying the success of Google is its achievement to prevent the loss of employees working in the key functions of the algorithmic models developed by Google. As Karen May, the vice chairman of the personal development department of Google, said: "it's less about the aspiration to be number one in the world, and more that we want our employees and future employees to love it here, because that's what's going to make us successful." In a striking irony considering the analytics the firm uses to make most of its business decisions, Google takes it on face value that employee satisfaction is a profound driver of performance[78]. As you can see, Google actually tries to guarantee that the employees stay as long as possible by using the predictive analytic and exploring the motivation sources which are the most important for the employees.

[78] WEB_39, Mark C. Crowley, (2013), Not a Happy Accident: How Google Deliberately Designs Workplace Satisfaction , Fast Company, 5/17/2014

At the fifth step, there is the institutional action. While we concentrate on understanding the actions of our employees in the part of predictive analysis, we will focus on how the abilities which the whole enterprise needs may change in accordance with the company strategy according to the different scenario in the institutional action. It is necessary to process the data coming from different units of the company with the financial data and for the managers of the units, analysts, human resources unit and board members to develop models to be used for each unit of the enterprise by acting together.

For example, let's discuss the Cameco that is the biggest Uranium producer in the world. The company serving in four different countries like Canada, America, Australia and Kazakhstan employs 3500 people[79]. The company tries to understand the relation between the production made by the workforce analytics approach in finance part and people participating the production, to calculate the effect of the time spent by the equipment for each transaction to obtain Uranium on working hours and costs and estimate the cost of the days when an employee does not come to the company. On the other hand, it tries to foresee the number of people it needs to refine, for example, 1 kg of the mine it gets in the part of human resources. Thus, it will be possible for it to answer questions like "What size of workforce maximize productivity?", "What is the optimal staffing ratio for selected occupational groups?", "How long does it typically take selected positions to complete certain sets of activities?", "How do key variables, including site location, regulatory pressures, and labour force fluctuations impact key output metrics?", "What are the primary influencers of variability in productivity?[80]

The sophisticated analytical approach developed as a result of studies made by Cameco and its consultancy company Mercer has given an opportunity the managers in Cameco to foresee their own abilities they need and to estimate the cost of human resources they need for each option. Thus, a model that enables us to see the whole company has been formed and it has been possible to foresee the problems which require to know about the above human resources, finance and production areas.

[79]Web_40, Cameco: World's leader uranium manufacturer, http://www.cameco.com/about/, 5/18/2014
[80]Matthew Stevenson, Sean Junor, What Will Next Generation Workforce Planing Look Like? The Cameco Story, Mercer Webcast, Jan 28,2014

The sixth and last step in source management of human resources is real-time optimization, and structures called “talent supply chain” are used at this stage and it enables to transiently reflect how the talent and personnel needs of the companies will shape according to the phrases followed by the business necessities before and new projects declared on the business processes. Thus, while the balance of needed talent and personnel is protected, the future problems can be prevented by evaluating how effective the elements obtained from different channels (web advertisements, human resources companies, bill boards) are.

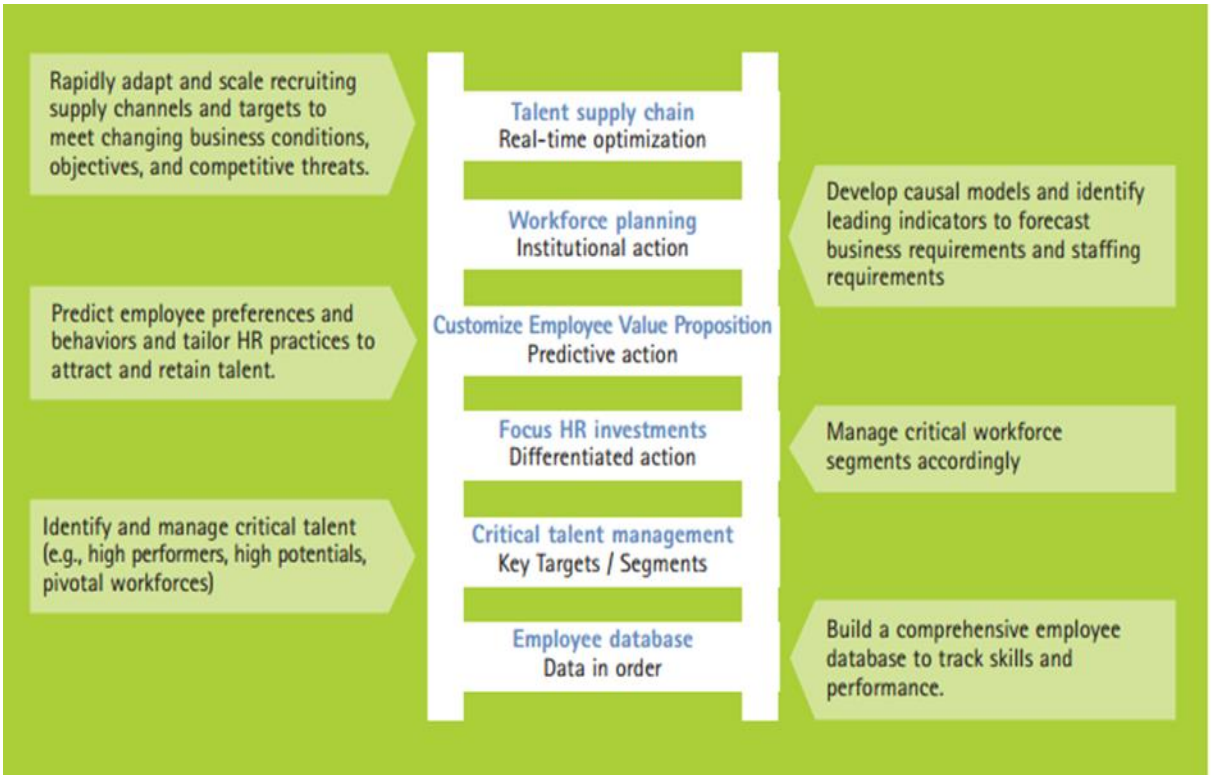


Figure 3.7. Analytical ladder on workforce planing

Source: Jeanne G. Harris, Elizabeth Craig and David A. Light,”The New Generation of Human Capital Analytics”, Accenture Institute for High Performance, July 2010

3.5.3. Target Stages

I will be mentioning about the changes in the objectives of the organizations according to their stages.

1. ***Stage 1 to Stage 2***

In the beginning, there is not any objective that organization will choose to differentiate in the competition or raise the performance. At this stage, it will be beneficial to work with a manager who has a data in his hands and a problem to solve in order to solve the problem and prove the benefits of the analytical tendency around the company. To draw attention of the other managers here will enable us to progress one more step and to more difficult problems.

2. ***Stage 2 to Stage 3***

After having success in some projects of which data is ready and implementation is respectively easy, it is important at this stage to receive the support of the managers who want to understand if he/she uses the analytic to recruit which business processes in the units and processes he/she is responsible for, he will get the highest benefit. Because although there are many targets in Stage 2, most of them are regional or unimportant to not to create a difference. In order to pass to Stage 3, we should concentrate on the projects which will create a difference and aim at rising in the analytical ladder. In addition, the business process we deal with has become more sophisticated and turned into the projects which will concern more units and in which more employees contribute. We should encourage thinking about the big Picture and trends shaping our business and increase our objections by making encouraging speeches on what opportunities the overview image of our business will create.

3. ***Stage 3 to Stage 4***

It is a stage in which the scraps of perspectives within the company are changed with a singular and holistic point of view, the analytical enterprises which are considered to provide the highest benefit for the areas to which our company produce a value that we found out as a result of seeing the big picture are focused and the methods related to the detection and evaluation of the business processes which will provide the biggest effect on

which we have mentioned before and related to transfer of the necessary company sources are shaped.

4. Stage 4 to Stage 5

At this stage, the analytic becomes an integral part of our enterprise. Objectives to earn competition advantage in accordance with the company strategy are chosen here. While forming the strategy, the analytical thought and models developed are estimated and the strategy is determined. Support of nearly all of the managers in the company is ensured and decisions are made in coordination with the senior managers.

3.6. Analysts

Technology and data are two important factors leading the analytical decisions. However, none of them are important and essential as human factor for a company that tries to be an analytical competitive. The organization needs analysts in order to get benefit from the opportunities. A single company with analytical tendency has not been seen so far that it does not employ lots of people who can think analytically. Thus, it is significant in the success of the organization to employ analysts who make analysis and produce business models by using the data and technology and can hypercritically make qualitative and quantitative analysis, to keep their enthusiasm for the work at the highest point by contributing in their development and providing the necessary environment.

In this part, I will mention about the types of analytical employees necessary in the successful analytical organizations and in which way these employees are directed, they will provide a sustainable analytical advantage for the company.

3.6.1. Analyst Types

1. Sponsors / Analytical Champions

They are the top managers who will start and support the analytical change. They are people who are the vehement defenders of the analytical methodology within the company and think freely on the usage of the computer technology in the business units and regard the knowledge obtained as a result of data analysis as the main element of the decisions they make and have high business minds. Their specialty stems from their understanding on how to determine the long-term strategy of the company and how to reach the point aimed by using the analytical techniques. Their aims are not only to find the problems, but also solve them. According to Steven Udvarhelyi, the senior vice president and chief medical officer of the company of Independence Blue Cross and Affiliates: "Having analytical capabilities and the best data in the world doesn't create competitive advantage. Changing the way the business uses it is the only way to create advantage" [81] This makes an emphasis on the power to change the business processes which is the most important characteristics of the sponsors. İt is impossible to find out the real value of the analytic without sponsors.

The effect of the power to change the business process on the business may be really high. Back when modeling for telecommunications churn was hot, one of my colleagues identified that a lost or stolen phone was a great indicator of customer churn. Knew right away that this was because of the time lag between losing a phone and getting a replacement phone. If a person with a lost phone no longer needed to fulfill the requirements of his contract, it was easier to go to the store and sign up for a new contract with any telecommunications provider, than wait for a replacement phone with the current provider. Because of this finding, the champion implemented an easy process for replacing lost or stolen phones with overnight shipping and no red tape. Sure, he could have just used

[81]Thomas H. Davenport, Jeanne G. Harris, Robert Morison, (2010), Analytics at Work: Smarter Decisions, Better Results, Harvard Business School Press, Boston, USA p.92.

"lost or stolen" as an indicator of churn, but by changing processes, this company was able to beat the other providers to a resolution.[82]

Scientists (Data Scientists) / Analytical Professionals

It is the group that has the highest ability, knowledge and experience about the quantitative abilities needed to implement the analytics applications. They are the chief architects of the analytical applications. They develop statistical models and algoritms to be used in the analysis by the company employees. They are generally the persons who are at the top of the analytical hierarchy and use the methods of developed analysis, modelling and various data, text mining such as statistical analysis on why the incident takes place, trend analysis with forecasting methods, predictive models on what can happen in the future and optimization models for recruitment of the processes. They also develop the systems necessary for visualizing and interpretation of the data.

It is not enough to read a few statistics book in order to be a professional or, in other words, scientist. These persons are generally people who come from an analytical discipline that discusses how to make better decisions such as operations research, or disciplines which are close to the numeral methods such as statistics, economy or mathematics. They have mostly received master education. The fact that from which discipline these people will come varies according to the analytical differentiation points of the companies. While the analytical professionals specialized on the economy or finance and/or mathematics are preferred for the finance institutions which use the analytical methods for a long time, for example, people from branches such as geology who are able to develop analytical methods because they understand the nature of the thing may be encountered in the companies which make mineral exploration or oil drilling.

Data scientists should guide and lead the other people in the organization about the analytics in addition to all these duties, like in the sponsor we have mentioned before. They

[82] WEB_41, Laura Squier , (2013), 8 professionals you need to build your analytics dream team, http://www.sas.com/knowledge-exchange/business-analytics/building-an-analytical-culture/8-professionals-you-need-to-build-your-analytics-dream-team-cont/index.html, 5/19/2014

are also people who are consulted about the formation of the company strategy and how to reach this strategy.

The biggest problem related to the data scientists is the difficulty of employing these people. Today the need of the many enterprises is people who knows the analytics, can speak the business language to transfer the business to internal and external stakeholders and know the R language to transfer the analytical models to the computer, can use the data analysis systems like Hadoop and are experienced on SaS and SQL. However, even the institutions which have managed to be top in the best workplaces to work rank with the opportunities they provide for their employees like Google have difficulty in finding the labor force that has required qualifications. The UC Berkeley professor Hal Varian, who has been working as a consultant in Google since 2002, draws attention with this speech about this subject: One point that I think needs more emphasis is the dificulty of hiring in this area. Given the emphasis on data, data warehousing, data mining and the like you would think that this would be a popular career area for statisticians. Not so!The bright ones all want to go into biotech, alas. So it is quite hard to pull the talent together,even for Google!"[83] Because it is difficult to find these three abilities we have mentioned above together, data scientists mostly need translators in order to communicate with the employees. The translators are people who translate the language the scientist speaks to understandable business language. The fact that scientists are perceived as alien in the company due to their abilities is a normal situation.

2. Experts / Analytical Semiprofessionals

They are people who have a high numeral tendency and knowledge about the functions of the organization and industry. To apply the models and algorithms produced by the scientists on the business and use the results they get to solve the complex business problems are their studies. Their knowledge about the industry and organization functions provides them ease about understanding the structure and flow of tha data, so the production, collection and interpretation of the data are their specialty. They associate the

[83]Thomas H. Davenport, Jeanne G. Harris, (2007), Competing on Analytics, Harvard Business Press, Boston, USA, s.142.

processes with the understanding they obtain as a result of the analysis they make by making complex inquiries on the data and using the models presented by the scientists, and they also prepare informing reportings.

They have become specialized on using the analytical tools. They use tools screening the data provided to them (data charts, gauges etc.), tools we call what-if-tool which help to calculate the projections of a known value according to the unknown value groups and statistical calculation tools like SPSS.

In addition to these, because they have knowledge about the business and analytical methodology, they help to build a connection between the data scientists and other people, and they inform other people about the benefits of the analytic. They play the role of translator we have mentioned before.

3. Users / Analytical Amateurs

They are people who work in different levels of the organization and use the data and analytic to do their daily works. Their business is not related to the analytic, but they are expected to understand analytic a little at least in order to do their job in a successful way.

They are employees who may be found in every level of the organization. They immingle the simple data analysis and understanding they have about the business and use the analytic to do business. For instance, this group includes call center employees who offer customers due to the analytical softwares in their computers, marketing employees who think how to increase the sales by examining the sales projections or supply chain managers who make orders regarding the suggestions made by the supply chain software and try to keep the stock status at a certain level.

Although it never comes to your mind for the analytic users, the charismatic actor of the Hollywood, Will Smith, is a good example of this. The Year 2007 was a terrible year for many big movie stars. One major exception was Will Smith, whose film “I Am Legend” set a box-office record for a movie opening in December, taking in $77 million. In 2008, Smith’s star vehicle “Hancock” grossed more than $625 million worldwide despite poor critical reviews. Smith’s success was not all that surprising, however: With the exception of

the Harry Potter movies, those in which Smith star have higher opening weekends and average box-office receipts than movies with any other male lead[84] What was it that made Will Smith so successful? In fact, the answer is hidden in the fact that Will Smith immingles the statistical approach and analytical methodology with his innate acting talent. Will Smith has divided the films he was interested in before he made his first cinema film into subcategories and evaluated them according to some features he determined. He has come more close than other actors to understand which factors affect the box office success as a result of the correlation between the results of questions like, for example, "Is there any love element in these films?", "Are special effects used?" and gates films obtain. He says: "I study patterns. Nine out of the top 10 biggest movies of all times have special effects; eight out of 10 have creatures in them; seven out of 10 have a love story. So if you want a hit, you might want to throw those in the mix. I just study patterns and try to stand where lightning strikes."[85] In short, Smith, who evaluates the projects he is in not only with his emotions, but also according to the data he obtains from the analysis he makes, constitutes a good example for the analytical users.

I add general job advertisements below created by the Accenture by scanning the advertisements about the relative duties for each type of the analysts we have mentioned above. Thus, I believe that I will make the reader visualize which features each analyst should have and their role within the enterprise better.

[84] R. Grover, Box Office Brawn, (2008) ,BusinessWeek, January 14,2008, p.18
[85] Scott Bowles, (2008) , Will Smith Has Found the magic Formula, USA Today, June 26,2008

Help Wanted: Analytical Champion

Director or senior vice president of client analytics

Job Description:
- Lead the development of a robust analytical environment
- Manage all client analytics projects to ensure timely delivery of deep client insight
- Develop knowledge infrastructure to support client development
- Provide analytical and statistical consulting as required
- Perform trend analysis to support decision rationale
- Direct the design and implementation of Client Satisfaction Measurement programs

Requirements:
- Minimum of 10 years work experience, the majority of which should be in an analytical role within a large financial services organization; experience in managing an analytical team is preferred
- Proven experience in independently developing robust statistical models
- Superior hands-on knowledge of data-mining and business intelligence tools, particularly SAS and SQL

Help Wanted: Analytical Professional

Lead artifical intelligence—data mining engineer

Job Description:
- Responsible for research, design, prototyping and support of intelligent information processing applications
- Responsible for both application and research across a broad range of AI technologies: data mining, natural language process, human centered design, learning and intelligent systems, and information semantics
- Must be able to design, prototype and support intelligent information processing applications with primary focus on data-mining components and integration and evaluation of statistical analysis technologies

Requirements:
- PhD strongly preferred, with 5 years of work experience
- Strong skills in data mining and the intersection with other technologies such as signal and image processing—statistical classification models, clustering, time series data, handling huge data sets, etc
- Ability and desire to lead technical project teams
- Ability and desire to meet with customers, understand their needs, and generate appropriate, innovative technical solutions
- Programming ability is desirable: C, Matlab, Java, Perl, Unix/Linux

Help Wanted: Analytical Semi-professional

Manager, market research

Job Description:
- Manage all marketing tests and analysis including market-based analysis, field, direct mail and e-commerce tests.
- Define test objectives, key metrics, and test parameters; assure that tests are planned and executed effectively to maximize confidence in results.
- Interpret results and recommend strategies, segmentations and programs to enhance customer insights and identify untapped market demands.

Requirements:
- Bachelors Degree, preferably in a quantitative field.
- 5+ years experience in a testing and measurement or data analysis role within an in-house consultative research organization or agency.
- Proficiency in SAS or SPSS
- Masters degree strongly preferred.

Help Wanted: Analytical Amateur

Supervisor, distribution plant

Job Description:
- Monitors throughput, volume fluctuations and labor utilization to ensure smooth distribution operations. Ensures appropriate staffing to meet new business requirements and volume fluctuations.
- Operates within established budgets, forecasts, cost objectives and service levels to control expenses. Supports implementation of cost, quality and service improvement initiatives.
- Supports all established plant and distribution goals and objectives. Apprises manager of team progress and any obstacles.
- Ensures effective and timely communication of company, plant and department information to managers, peers and work team.

Requirements:
- Strong leadership, team-building, and problem-solving skills
- Ability to coach and mentor employees
- Ability to provide technical leadership

Figure 3.8. Job postings for different analytical positions

Source: Jeanne G. Harris, Elizabeth Craig and Henry Egan, "Counting on Analytical Talent", Accenture Institute for High Performance, March 2010

You can see the distribution of the analytical employees in the companies according to these 4 categories below.

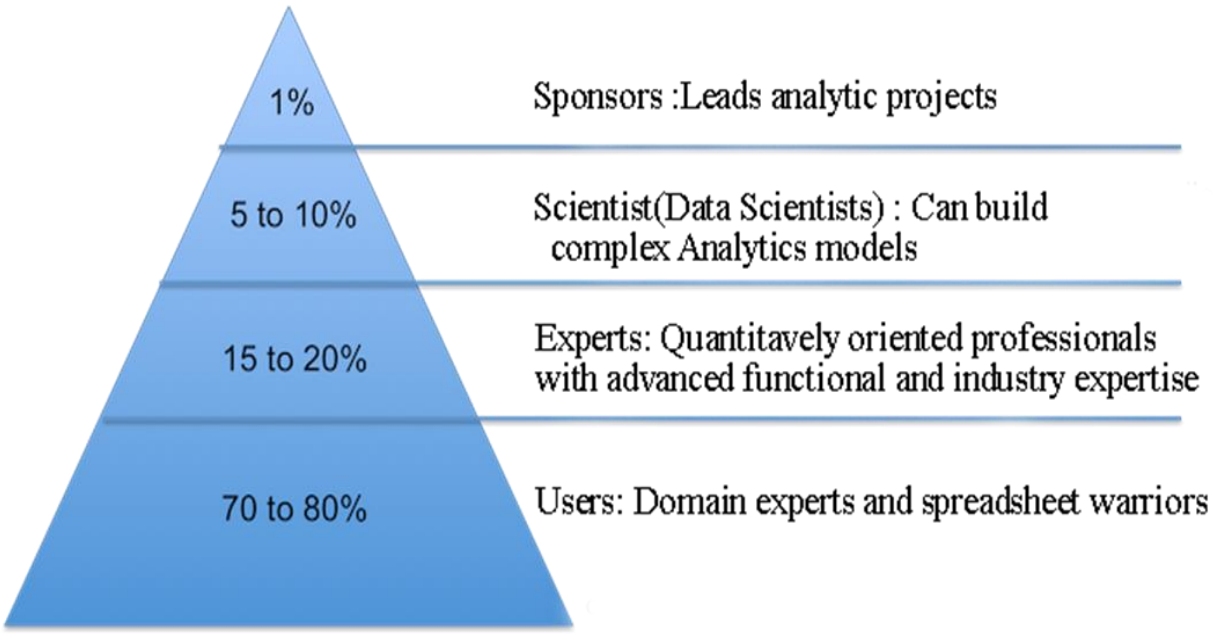


Figure 3.9. Distribution of analytical people in the organization

Source: Thomas H. Davenport, International Institute for Analytics; "Enterprise Analytics: Optimize Performance, Process, and Decisions Through Big Data", FT Press, 2012 p.180.

3.6.2. Analytical Skills

I always believe that the easiest way to find abilities needed to perform a business is to examine the advertisements related to that business. When I look at the advertisements of the companies searching for an analyst about the analytics, first numeral abilities necessary to make a large scale data analysis and constitute statistical models for segmentation,

classification, optimization and time series stand out. However, a good analyst is not only the person who knows logistical regression, multi-nominal regression, CHAID and clustering analysis methods and/or uses the tools like Excel, SQL, SAS needed, but also his/her communication with other people should be good.

1. Quantitative and Technical Skills

Among the analyst types we have mentioned before, the analytical professionals have the most developed numeral abilities and are the chief architects of the analytical applications. Yet, all analysts are people who have a high numeral understanding about their own business and industries. The necessities of each industry are different. For example, while an analyst working in the finance industry knows the Stochastic volatility analysis used in calculation of the long term income of the derivative securities, the analysts working in the health services have knowledge about the health care informatics studying on processing the information related to the health and medicine which are the intersection set with the health care. The analysts should also know using the softwares related to their business provided to them. While these tools are sometimes programs which enable us perform the what-if analysis like Excel, they sometimes may be softwares like SPSS which enables us interpret the graphics provided to us by the visual tools or make statistical analysis.

2. Business Knowledge and Design Skills

The point that distinguishes the analysts from the statisticians is the knowledge they have about the business processes. If we cannot produce solutions which will increase our understanding about the business and enable us get ahead of our rivals, it means that we cannot exactly reveal the potential of the analytics. For this reason, the analyst should have knowledge about the strategy and objective of the organization he/she works in and understand the business disciplines and processes. Thus, it may be possible for the organization to explore the differentiation points and foresee the future problems.

3. Relationship and Consulting

Human relations and consultancy ability enable the analyst to work with the people around him/her in a more effective way. Thus, detecting and understanding the problems, guiding the group and producing the analytical applications get easier. The analyst should influence the other people, and this requires the ability of getting out of the box and think and considering a problem sophisticatedly. In addition, he/she should know listening as speaking. He/she should understand the problems and transfer the solutions in a suitable way that other people will understand. To transfer the results of the analytical business made both ensures that the best methods are standardized for solution of business and draws attention to the value produced with the project. To share the results with our business partners shapes our business relations with our customers and suppliers.

4. Coaching and Staff Development Skills

For the companies with the analytical tendency, coaching and staff development abilities are indispensible. They gain more importance in multinational companies where new employees are constantly added to the labor force and which have offices in different geographical locations and holdings in which many companies operate together. Scattered structures in which the analysts do not gather on a point ensure that the best solutions are shared within the organization. A good coaching helps analysts develop their numeral abilities by asking right questions and ensures that the value that the studies add to the company is understood.

Although the 4 analyst types we have mentioned before have a grasp of the above-written abilities, while the numeral abilities of the analytical professionals are more developed when compared to other analysts, human relations and business understanding of the champions outweigh. You can see the distribution of the skills we have mentioned according to the analyst types in the below table.

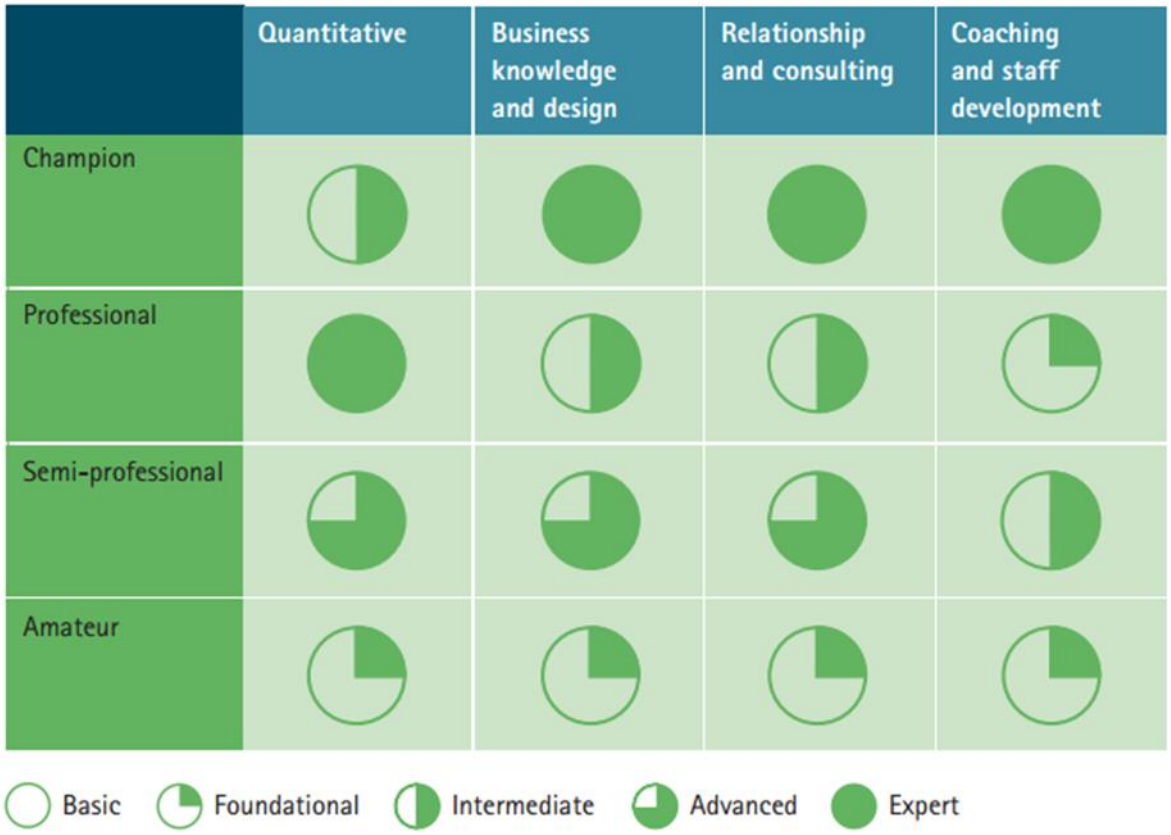


Figure 3.10. Skill comparison of analytic employees

Source : Jeanne G. Harris, Elizabeth Craig, and Henry Egar,"How to Create a Talent-Powered Analytical Organization", research report, Accenture Institue for High Performance, 2009

3.6.3. Exploring New Sources Related to the Analytical Abilities

While writing our thesis, we have mentioned about that human source is not limited so far. Especially for the companies which adopt the analytical competition, demand for the analytical professionals will increase and at one point, the supply in the supply demand balance will not meet the demand. Although giving priority to the processes which constitute the differentiation point of our company and training our employees about making some simple analysis, we must develop new strategies to find the analysts our company needs in the long run.

In this section, I will mention about the new sources our company can head for in order to meet our analyst need.

3.7. Looking Within the Organization

If our company has just begun to climb analytical steps, the organization needs to first look into itself and detect the analysts in order to find the abilities needed. We should firstly look at the departments of finance, customer relations, strategy and IT where the analytical abilities are mostly used in order to find the analysts whose numeral abilities are developed. The numeral inclination of these units creates the ideal environment for the analytics professionals and semi-professionals needed. Then we can extend our search criteria and look at the other analytical positions scattered to different units within the organization. Maybe there are employees who use different analytical methods to evaluate the employees in the department of human resources.

3.7.1. External Sources

We can follow the conferences and activities about their interest in order to find the data scientists and experts we need. The most important and original one of these activities is INFORMS. However, Sports Analytics Innovation Summit and Applications in Medicine, Biotechnology, Food Industries organized by the MDA can be followed according to the area the organization serves in or activities such as Predictive Analytics World, Big Data Innovation, TAW: Text Analytics World Summit can be followed according to the analytical area needed.

In addition, the activities to which graduates from the schools which educate about the numeral sciences or analytics are also convenient to find the numeral abilities needed. Many analysts cluster around these universities in which such educations about the numeral sciences or analytics (The university fees are lower in America if you choose the university in the region you live) and financial centers which are intensely used analytically. We can also find these people having the analytics abilities we need through social networks such as linkedin, xing or job search sites for quants such as quantster.com, quantstart.com,

jobs.phds.org although they are not in our country. Another method, of course, is to transfer the abilities we need from our rivals and the companies serving in the similar sectors.

In addition, we can cooperate with the universities in order to meet our analyst need that regularly rises and will rise. Sponsorships given and training opportunities help to reinforce the relations with the universities. For example, SAS North Carolina State University and "Masters in Advanced Analytics" program are in cooperation. This cooperation with SAS has been appreciated in the website of the school and it has been mentioned that SAS has deserved to receive 90% of the 2014 class of the certificates related to the tools which have become industry standard[86].

According to the foundings of the Fortune magazine, online help-wanted ads for data analysis mavens have shot up 46% since April 2011, and 246% since April 2009, to over 31,000 openings now, according to job-market trackers[87]. As you can see, it is difficult to create teams which will conduct the whole analytical activities because of the reasons like lack of knowledge or experience or employee inadequacy for many companies in the market where the need increases incrementally. This situation pushes the organizations to outsource some of their analytics acitivities. The manager of an American retail company explains why they outsource some analytics functions in this way: "The forecasting group involves very technical kinds of skills and experience, and so I prefer having a resource that can provide me with the very best people on an ongoing basis and has a bigger pool of talent to draw from"[88]

In fact, it is known that Fortune 500 companies outsource many businesses to the markets with cheap labor force such as India, China and Philippines. Although the outsource insanity starting because of the explosion of the telecommunication in 1990s has firstly started with the opening of call centers in old colonial countries such as India and Philippines where English is widely used and which provide cheap labor force, it has turned into a general trend by the time IT services, even American law companies shift their

[86]WEB_42, Institute for advanced analytics, NC State University, http://analytics.ncsu.edu/, 5/20/2014
[87]A. Fisher, Wanted: Data Scientists. No Math Chops? No Problem, Fortune, May 10, 2013
[88]Chris Donnelly,(2009), Shopping for Scarce Retail Talent: Driving High Performance in the Retail Industry Through Strategic Talent Management , Accenture research report, 2009

examination of case files and accounting units to these countries. The analytics which was outsourced to developed companies like North America and Europe before has recently been included in this trend. In this situation, the rooted mathematics and statistics education that countries such as India has contribute to the developments about the IT services.

In a rapidly changing market, offshoring allows organizations to increase flexibility by making fixed costs variable, which in turn can boost other success factors. The success of BPO partnerships is dependent on such factors as the geographic distance between onshore and offshore hubs, the existence of adequate infrastructure and connectivity, adequate language and technical skills and proper contingency planning. Potential customers need to conduct thorough and appropriate research in advance of the project, and management needs to fully communicate the important decisions to all affected parties[89]

By the way, you can see the distribution of the industries and analytics businesses into the countries between the years 2010-2015 below. Though the developed countries stil produce the analytics business at most, I believe that we will observe that more new analytics position will be opened from the countries such as India, China and Brazil which are developing, America and England which are developed as a result of outsourcing we have mentioned above and increasing internal demand.

[89] David Fogarty and Peter C. Bell, (2013), Should You Outsource Analytics?, MITSloan Management Review, Winter 2014 ed.

	United States	India	China	United Kingdom	Brazil	Japan	Singapore
Analytics services	11%	54%	25%	9%	14%	6%	9%
Pharmaceuticals	14%	24%	32%	19%	30%	44%	26%
Insurance	39%	7%	8%	32%	11%	27%	24%
Banking	20%	11%	22%	25%	19%	14%	25%
Oil and gas	14%	3%	10%	13%	23%	8%	9%
Communications technology	2%	1%	3%	2%	3%	1%	7%
Total number of jobs	38,700	31,500	30,500	7,000	6,200	2,400	1,300

Figure 3.11. Demand for analytic professionals according to countries and industries

Source: Elizabeth Craig, David Smith, Narendra P. Mulani and Robert J. Thomas,"Where will you find your analytics talent?", Accenture

<http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture-Outlook-Where-will-you-find-your-analytics-talent.pdf>

Finally I want to mention about one another method. Some companies like P&G, Amazon, Eli Lilly and Solvay are finding creative ways to harness analytical expertise through virtual collaboration and crowd-sourcing techniques.For example, they are using Webbased "idea marketplaces," such as www.Innocentive.com and www.NineSigma.com to post requests (and rewards) for solutions to their trickiest analytical problems.[90] Additionally, Netflix about which we have mentioned before, for instance, has a competition in which it gives 1 million dollars as a prize to the persons or groups who provide a 10% of recruitment in CineMatch algorithm that is the main differentiation point.

[90]Jeanne G. Harris, Elizabeth Craig and Henry Egan, (2010) ,Counting on Analytical Talent, Accenture Institute for High Performance, March 2010

3.7.2. Keeping Analysts

We have discussed up until now the types of analysts, who they are, their abilities to have and from which sources we could meet the analyst requirements of our organization. We will discuss here how we can make them more productive and also how we can motivate them.

Day by day companies aiming at analytical competition are increasing, Accenture survey of executives at large companies in the US and UK, nearly three-quarters of participants said they are working to increase their company's use of analytics[91] and analytical approach is bringing about different needs as we mentioned before. For instance; leadership, needs relating to details, how to prefer enterprise aim and goals, etc. This requires a change in information technologies, company structure, business processes and cultures. However, the most important problem required to be solved is the one relating to the people having analytical ability. Because people having analytical ability is processing available data in order to make the best decisions and take the best results in every point of the management. Statistical models that they created and analysis that they made can answer sometimes the purpose of being more effective to make advertisement of a new product through which channels and sometimes enhancing the decisions such as promotions to be given with the product and also estimations of profits or losses to our enterprise provided by companies to be newly purchased or to be merged with.

Organization may have all types of analysts as we mentioned before, however to guarantee abilities required to deem our company as analytical competitive is not possible only by employing more analytical specialists by human Sources department. To find and keep analysts, it is important to understand what makes them motivated, which jobs they are interested in and how we can provide them for focusing on business with their all attractions. Thus, we can ensure that they support our organization when climbing analytical success steps by increasing the efficiency of this rare and valuable source and the work participation.

[91] Accenture Institute, (2008),Competing Through Business Analytics to Achieve High Performance, Accenture Information Management Services, December 2008.

There are so many researches in literature on how to motive the employees and how to keep their enthusiasm and participation relating to work. However, Analysts differ from others. Yes like others, they also find making a job to have meaning for organization and carrier opportunities as motivating, however their background, experiences, abilities and motivation sources differ from other employees. For this reason, it is required to develop different approaches and structures to fulfill their needs for analysts. Organizations that could not meet these special needs lose their analytical work force that they have, have difficulty in finding new analysts and/ or as they could not show all their potential on work, the operating efficiency and accordingly the profitability decrease. Moreover, researches made have proved that enthusiasms of employers have increased customer loyalty, profitability, productivity and so the company performance[92].

Fortunately, it is seen that the enthusiasm of analysts for work is higher than other employees as a result of Accenture survey including questions such as company culture, management methods and carrier opportunities showing the enthusiasm of more than 30 employees for their work. Although analytic works are seen as more complex and boring for people having verbal intelligence, there is no reason not to find their work attractive and satisfactory for the analysts having opportunity to use their abilities, working in line with organization strategy, meeting the needs and having opportunity to observe the effects of analyses to the company. Even so, according to the survey results, it is another fact that one of every four analysts does not find his/her work satisfactory enough. The following graphic reflects the satisfaction obtained from work according to the types of analysts.

[92] James K. Harter, Frank L. Schmidt and Theodore L. Hayes,(2002), Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis, Journal of Applied Psychology, 2002

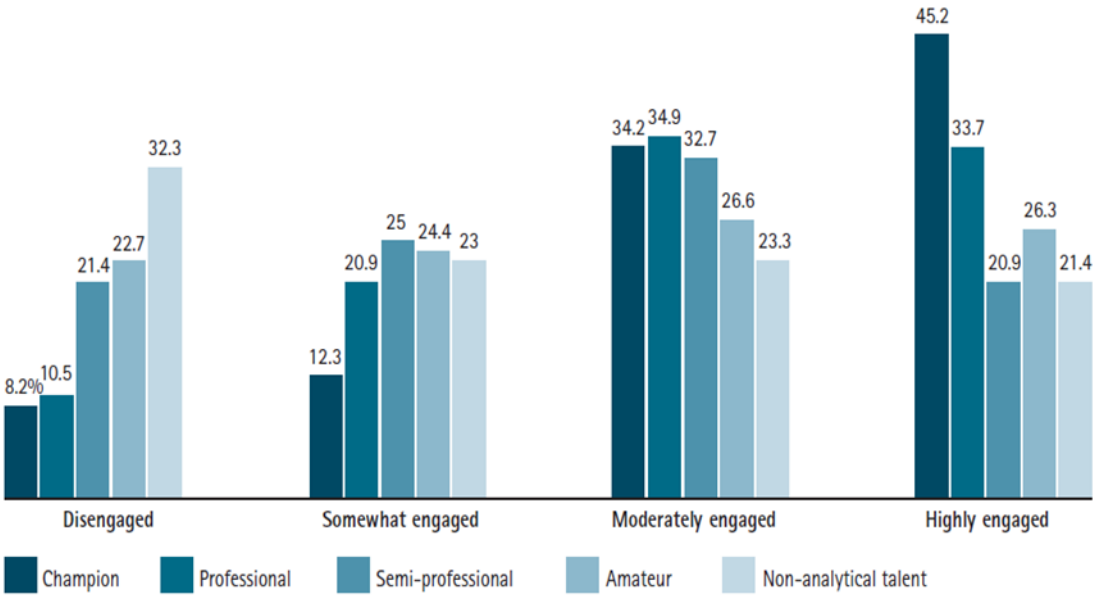


Figure 3.12. Engagement level of analytic professionals according to their skill levels

Source: Jeanne G. Harris, Elizabeth Craig and Henry Egan, "Counting on Analytical Talent", Accenture Institute for High Performance, March 2010

If the company could not keep the analysts and lose their knowledge and experiences to other companies, it may have difficulty in substitute them. Especially in this market in which the supply is low and demand is high as we mentioned before. Thus, it is important to understand which elements motivate the analysts in order to keep them.

Study on analysts that Accenture made in order to understand which factors increase their motivation and ambition to work and make them work for our company for extended periods. It has found out that other of our employees (non-analytic) ambition to work and some factors not influencing working hours for the company are important in order to keep analysts. Companies desiring to keep analysts should understand and execute the following five articles.

1. Arm Analysts with Critical Information about the Business

In time, the analytics will find a place in themselves as an inseparable part of the company strategy and good analyst and the best analyst can recognize the grasp of the business. As the analytical tendency increases, analysts should strengthen their grasp of the business. Ultimately, analysts cannot consort with creating statistical patterns and writing macros on excel. They should have required qualifications and information about the business in order to consider strategic problems confronted by the company and how the analytic generate these solutions.

Additionally, grasp of the business not only makes the analysts more effective, but also increases their ambition and enthusiasm about the business. The study that Accenture made shows that analysts who understand their company's strategy, goals, capabilities, and operations were three times more likely to be highly engaged than analysts who don't have a firm grasp of the business. Moreover, analysts who understand how their work relates to their organization's goals and contributes to its success were nearly six times more likely to be highly engaged than those who don't[93]

You can see how the business insight can influence the demands of Analysts about business in the following graphic. As it is seen, as the grasp of business increases the satisfaction also rises.

[93] Thomas H. Davenport, International Institute for Analytics, (2012), Enterprise Analytics: Optimize Performance, Process, and Decisions through Big Data, FT Press, New Jersey, USA, p.182.

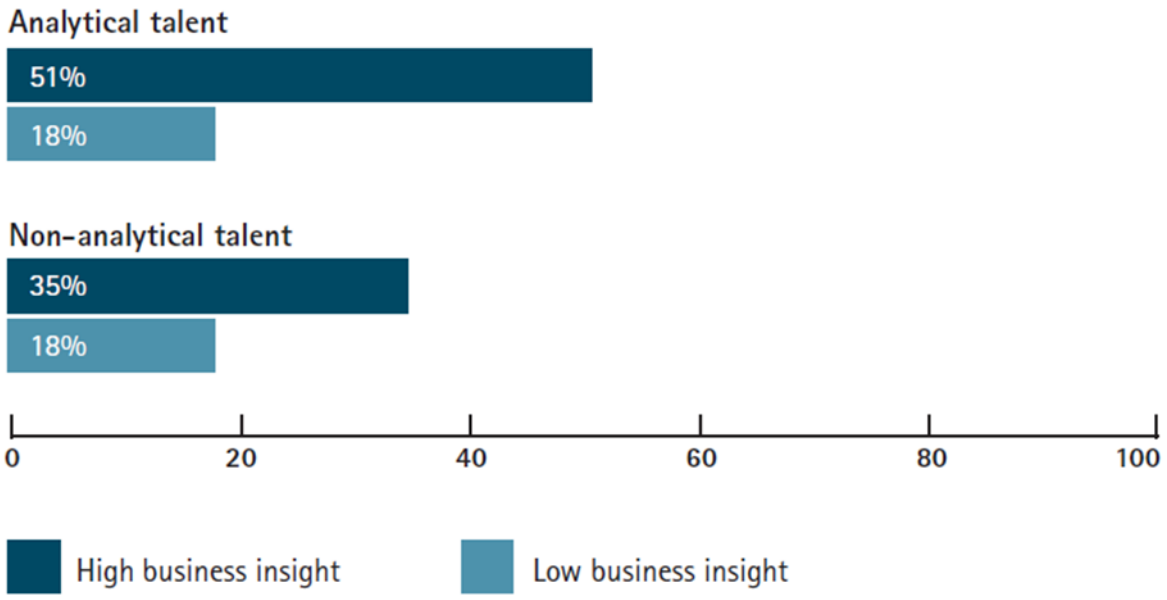


Figure 3.13. How business insight affect engagement of analysts

Source: Jeanne G. Harris, Elizabeth Craig and Henry Egan, "Counting on Analytical Talent", Accenture Institute for High Performance, March 2010

For instance, analysts in Duke Energy company should be prepared in order to declare analytics works to those concerned, organizations responsible for arrangements and public within this organization. For instance, when offering for opening a new power plant, analyst may be called to explain to public why they have made this decision and the steps that the company have followed. According to Dick Stevie, Managing Director of Customer Marketing Analytics, this requires "precision, completeness and clarity—no jargon and no metaphor. You've got to convince a panel that what you've done is logical and reasonable." To prepare for these situations, Stevie routinely puts analysts in front of top management and group leaders for mock trials, where the analysts get practice testifying and being cross-examined. Analysts who understand the external business landscape and can speak the language of business are both effective and engaged.[94]

[94] Jeanne G. Harris, Elizabeth Craig and Henry Egan, (2010), How to Engage and Retain Analytical Talent, Accenture Institute for High Performance, January 2010

2. Define Roles and Expectations

Even if managers usually think that they can convey through telepathy to their employees what they can do or everyone is already dutiful, the fact is that the expectations specified properly are important for job environment. Tolerance having uncertainty varies according to qualifications of persons and recent research at the University of Southern California suggests that students with high verbal scores may be better at coping with ambiguity and uncertainty, a crucial talent for managers moving into jobs with few ground rules and much call for improvisation[95], but when it comes to analysts, it has shown up that organization structures specified properly make them more effective. Michael Driver, a professor of University of South California Business School, says he recently analyzed standardized personality tests given to 1,200 business students at USC. The quant jocks, he found, were intolerant of uncertainty[96].

Analysts creating models about how to make business processes more effective and making analyses on data are inclined to prefer their predictable job environment and ordered structures. Ultimately, the thing that makes them the best at what he/she does is this linear way of thinking.

Accenture survey shows that the analysts knowing what their roles are in workplace are 6 times more motivated and eager for their job than others. We can observe in the following graphic.

[95] Brian O'Reilly and Antony J. Michels,(1994),Reengineering the MBA, Fortune, January 24, 1994
[96] Brian O'Reilly and Antony J. Michels,(1994),Reengineering the MBA, Fortune, January 24, 1994

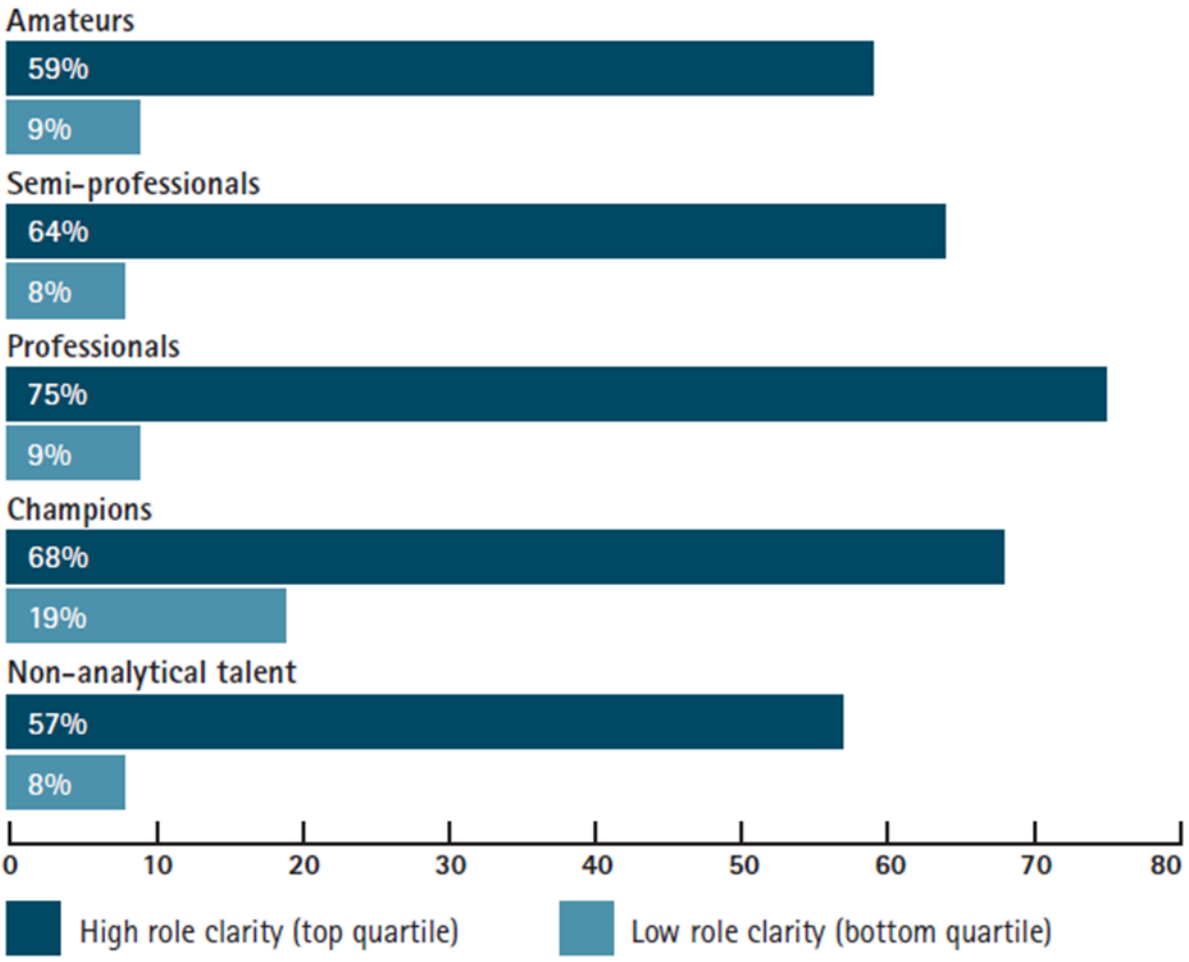


Figure 3.14. How role clarity affect the engagement of different type of analysts

Source: Jeanne G. Harris, Elizabeth Craig and Henry Egan, "Counting on Analytical Talent", Accenture Institute for High Performance, March 2010

Specifying clearly roles of employees should start by job notices, daily-to-do works of the employee for each recruitment should be explained properly, it should be stated how they should spend their times for each work. For example, Good uses Eric Schmidt's 70-20-10 [97]method for the time management. While employees use 70% of their time in order

[97] John Battelle ,(2005), The 70 Percent Solution: Google CEO Eric Schmidt gives us his golden rules for managing innovation, CNN Money magazine, December 1, 2005

to perform basic work functions, they spare 20% of it to the projects relating to work, thus they have the opportunity to develop their technical abilities to

provide benefits for the company in other works they will do. They also spare 10% of it in order to make innovations relating to the product and work.

Tammy Erickson points out in an article about team dynamics that he published in Harvard Business Review how important role definitions are. Collaboration improves when the roles of individual team members are clearly defined and well understood — in fact, when individuals feel their role is bounded in ways that allow them to do a significant portion of their work independently. Without such clarity, team members are likely to waste energy negotiating roles or protecting turf, rather than focusing on the task.[98]

Accenture survey also shows that although role clarity is important for analysts, analytic employees give greater importance to know responsibilities and goals. They also give importance to report for whom and work for whom. Surely, we are not mentioning that responsibilities and goals have become routine, because analysts give importance to attractive works through which they can improve themselves.

3. Feed Analysts' Love of New Techniques, Tools and Technologies

If it is not monopoly, all organizations are subjected to competition in some extent. We can confront with new tools and technics every day in business life, even if this is not very important for the ones working in jobs whose regulations are not amended or blue-collar workers. Learning new technics and tools is very important for the ones working in jobs requiring certain specialization; the analyst is also the one of them.

Accenture survey put forth that keeping up-to-date the abilities that analysts have in order to save and improve analytic capacity of the organization is important with regards to both attachment to work of analysts and organization. According to the survey, analysts

[98] Tammy Erickson, (2012) ,The Biggest Mistake You (Probably) Make with Teams, Harvard Business Review, April 5 2012

who have opportunities to keep up with advances and developments in their field were three times more likely to be highly engaged than those who don't[99].

4. Employ More Centralized Analytical Organization Structures

Accenture survey analyzed the models of centralized and decentralized organization and presented that the most suitable model is the centralized model in order to decrease the rate of quitting job and increase the eagerness and motivations for work of analysts. Here are the survey results: The most successful organizational models in that regard are the center of excellence (CoE) (29% engaged, 41% likely to stay) and centralized (35% engaged, 33% likely to stay) models. The percentage for more decentralized model had only 18% of analysts engagement and 27% likely to stay.[100]

Moreover, centralized analytics models provide analysts with the opportunities of carrier and increase work satisfactions as they see the big image and usually understand the connection of company's all departments with each other in comparison with the analysts integrated in business units and being specialist in their field but cannot see the entirety.

5. Give Analysts the Management Support They Need

Analysts are persons whose job could not be understood by other workers mostly due to their numerical qualities and the nature of their job thus they are treated as if they are a calculator or an alien. For this reason, they usually think that the contribution that they make to job is not understood precisely or neglected. However, a good manager is the one who gives the necessary support and value and can gain the trust of analyst with his/ her objectivity and honesty.

It goes without saying but no matter how much the analyst loves his/her job, he/she will not hesitate to quit if he/she feels that he is not treated fairly and appreciated deservedly. Accenture concluded in his survey that analysts were three times more likely to stay when

[99] Jeanne G. Harris, Elizabeth Craig and Henry Egan, (2010), Counting on Analytical Talent, Accenture Institute for High Performance, March 2010

[100] Thomas H. Davenport, International Institute for Analytics, (2012), Enterprise Analytics: Optimize Performance, Process, and Decisions through Big Data, FT Press, New Jersey, USA, 2012 p.185.

they believe their supervisor acts with integrity, treats people fairly and helps employees to succeed.[101]

The following graphic shows the effect of factors that we mentioned before on the attachment of employee to company and the eagerness for work.

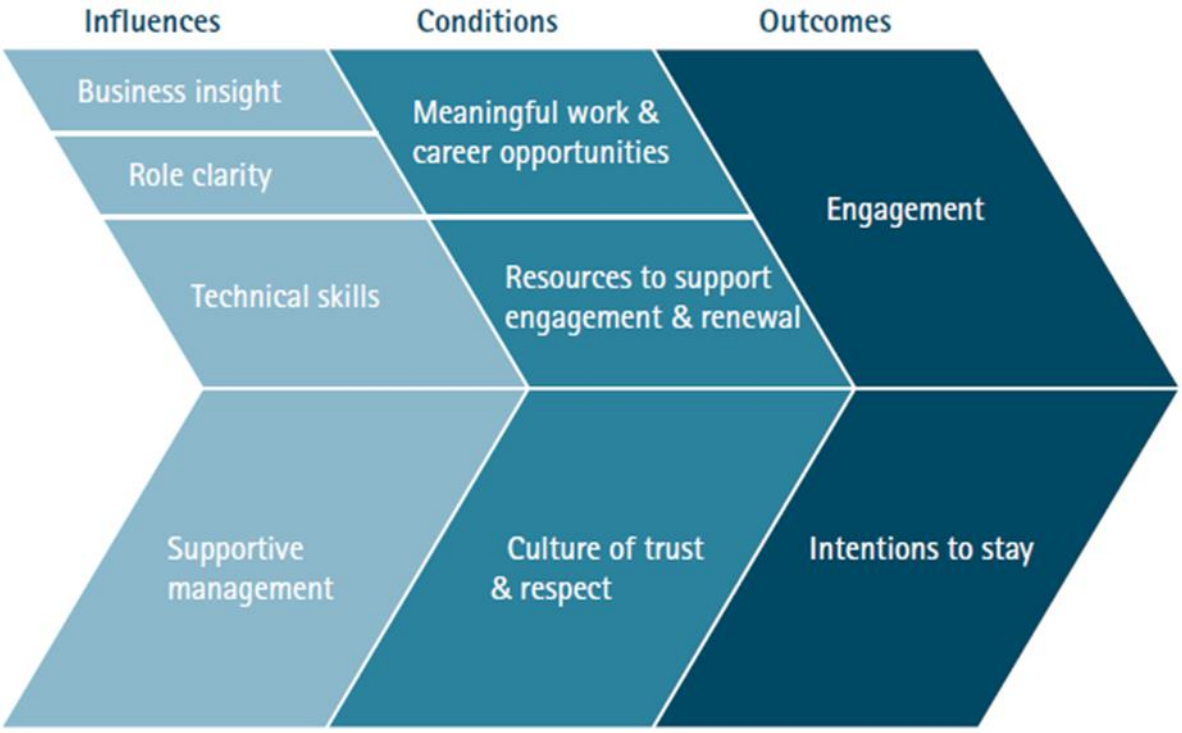


Figure 3.15. Factors affecting analyst work eagerness

Source: Jeanne G. Harris, Elizabeth Craig and Henry Egan, "Counting on Analytical Talent", Accenture Institute for High Performance, March 2010

3.7.3. Organizing the Analysts

Organization of analytic units can be seen in various forms from organization to organization. Centralized models in which all analysts gather just in one point are possible as well as decentralized models in which thousands of analysts work in different functions

[101] Jeanne G. Harris, Elizabeth Craig and Henry Egan, (2010) ,Counting on Analytical Talent, Accenture Institute for High Performance, March 2010

and working units are possible. Well, which model is the most suitable for keeping ultimate the motivation and attachment of our analysts? Accenture determined five different models used for organizing the analysts by organizations consisting large and multiple branches. Here we will mention and discuss which ones are more effective both for organization and analyst and how to organize so as to generate effective solutions with which our analyst may confront and to share experiences that they gain by keeping in touch with each other.

In order to understand which model is the most suitable for our company, we should primarily evaluate the analytic step, how fast we should take decision and apply, how resistant the organization is, how many it can accommodate the changes.

You can see the graphic relating to five models that have been determined in the following.

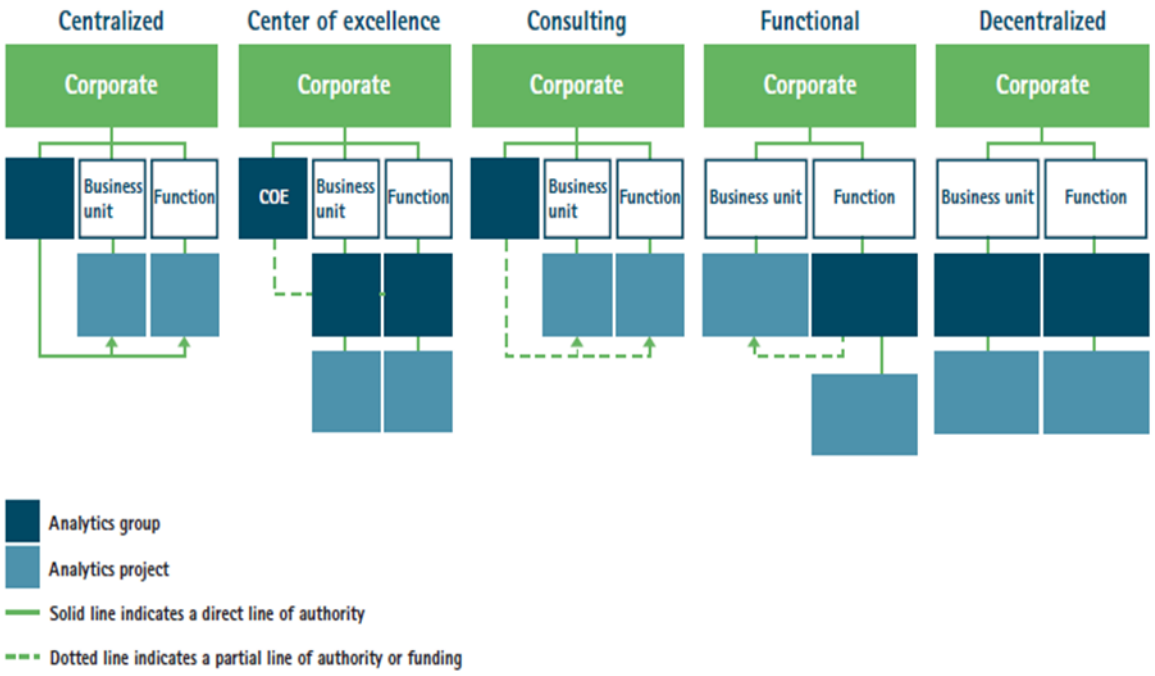


Figure 3.16. Analyst organizational models

Source: Jeanne G. Harris, Elizabeth Craig and Henry Egan, "Counting on Analytical Talent", Accenture Institute for High Performance, March 2010

Here we analyze the models respectively.

Centralized

Even if analysts seems as if they work in different business units and functions in Centralized models, all analyst groups are affiliated with just one unit and give their reports to these units. This situation makes easier to see the big picture. Analysts are guided based upon the utilization of the most effective source and the order of priority to projects which are considered to provide the biggest benefit in line with the organization strategy. Moreover, transferring the best methods learned for problem solving and mutual assistance gets easy as all of the analysts gather in one point. This avoids solving the same problems again and again. However, this model results in keeping distance between analysts and business.

2. Center of Excellence (CoE)

Model of Center of excellence is model which is less centralized in some respects. Even so, it enables coordination at enterprise level. In this model, analysts are unitized however works that they perform are coordinated by a sole center. Center of Excellence, in other words business intelligence competency center, enables to make collaboration among analysts. This central unit is responsible for training of analysts, analytic tools to be used, socialization of analysts working in different business units by organizing various events. In this way, both experience gained and the best practices can be shared, so this helps the development of results.

In a speech that the editors of SaS made with Brett Starr working as the director of the Business Intelligence Competency Center in an insurance company based in Ohio, Brett answered the question about where the unit that he manages should be placed exactly like this: The center just needs to be at the point where it can provide a service. Whether you have a 100 TB warehouse or a series of small databases, a competency center can create

common process and framework for intra- and extra-departmental analysis[102]. This shows us that CoE is have a voice on specification of necessary projects by analyzing analytical attempts within the scope of organization and transferring necessary sources by determining priorities of the project.

3. Consulting

Analysts are the part of a central organization in this model. They utilize pluses of centralized model relating to collaboration of analysts and sharing the best practices. However in this model, business units hire analysts and pay against service that they give instead of positioning analyst in projects seen as necessary by a central unit.

This model is more market-centered. However, there are some deficits. If it is not coordinated properly, the best analysts will focus on small problems in available well-functioning units and so problems to provide the best benefit for the organization may remain unsolved. In that case, it is important that analysts train their customers and give advices. Thus, the demand for analysts can be directed to the most needer units. United Airlines, eBay, and trucking firm Schneider National all employ the consulting approach.[103]

4. Functional

In this model, analysts give reports to the unit using analytics intensely and forming differentiation element of the company. In case there is so many differentiation elements, there may be analyst group affiliated to many units. Other units requiring analytics are served by analysts of this unit/ these units. In this model, basic analytics consumer characterized as home of analysts can be skidded from one point to the other with the change of analytic priorities of the unit company. For instance; while they had been working under operations previously, they were working under marketing department later.

[102] WEB_43, Anna Brown, (2012) ,How does a center of excellence really work?, sas.com, October 23, 2012 , http://www.sas.com/knowledge-exchange/business-analytics/building-an-analytical-culture/how-does-a-center-of-excellence-really-work/index.html, 5/22/2014

[103] Jeanne G. Harris, Elizabeth Craig and Henry Egan, (2010) ,Counting on Analytical Talent, Accenture Institute for High Performance, March 2010

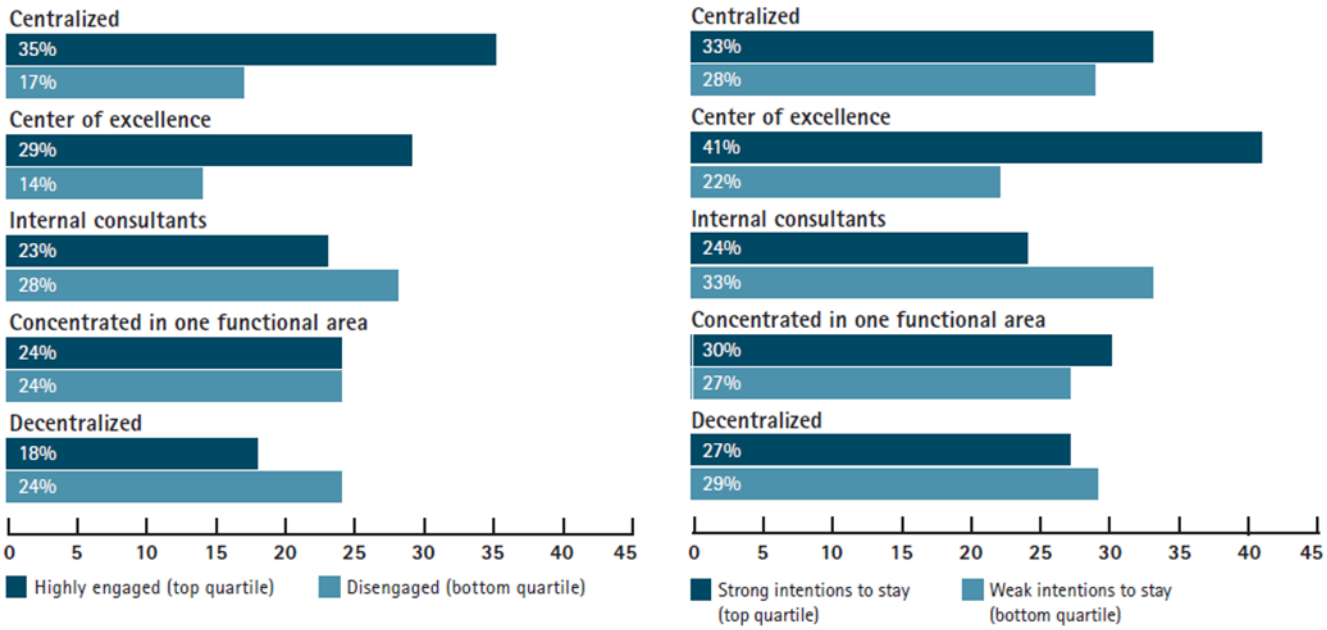
Fidelity uses this approach: The great majority of analysts work in the Customer Knowledge group, which reports to marketing. Analysts are found in large numbers in marketing at Carnival Cruise Lines and at GE Money (although they also work for the risk management function and other groups).[104]

5. Decentralized

In this model, analysts are branched into business units. For this reason, there is no coordination and as it is not possible to see the big picture, guidance of analysts according to the project priorities is not possible. This may result in lack of staff suffered by a group, while another group is idle.

The two following graphics show the eagerness of analysts to work and attachment to work according to these 5 models. In models where analyst have an opportunity to work together, it can be observed that eagerness and attachment to work of analysts increase. While the most succesfull models relating to the interest for work are centralized and centers of excellence, center of excellence model offering more freedom becomes prominent in attachment to work.

[104] Jeanne G. Harris, Elizabeth Craig and Henry Egan, (2010) ,Counting on Analytical Talent, Accenture Institute for High Performance, March 2010



3.17. Analyst work engagements according to organizational models

Source: Jeanne G. Harris, Elizabeth Craig and Henry Egan, "Counting on Analytical Talent", Accenture Institute for High Performance, March 2010

3.7.4. Analyst Stages

As we mentioned before, there is a need for well-trained man power to enable the company which will apply analytics methodology to utilize the opportunities in order to be analytic competitive. Well-trained analysts are the most valuable sources of a company. For this reason, understanding how to motivate them and how to keep them has a critical importance for our organization.

Even if it is fairly enough to appreciate our analysts and keep their attention in different jobs initially in competition steps, as the demand for analytics increases, some changes will be inevitable and we will have to create strategies and different models in order to keep our analysts, keep their qualities up-to-date, strengthen their motivation and attachment for work, charge them at proper points in line with the company strategy.

Here I will mention the things required to be made for analysts according to analytical competition steps.

1. Stage 1 to Stage 2

In this stage, it will be right that the organization determines analysts after looking in itself. Who are our analysts and which qualities have they? In this stage, many of our analysts can make analysis by using programs such as excel or maybe some department may take analytical steps by utilizing databases relating to the department. In order to find analyst in this stage, it will make our work easier to start by looking departments such as finance, marketing which have high analytical tendency. Once analysts are determined, opportunity can be created in order to expand and improve their qualities by organizing different training programs. Their motivation relating to work can be increased by making them recognized and appreciated after informing their presence to managers. Analysts can be encouraged in order to communicate with each other and exchange information.

2. Stage 2 to Stage 3

In this stage, we should expend energy in order to find, manage and develop analysts. We should determine the positions in which our company needs analyst and advertise so as to attract their attention. We should utilize the opportunities of relation with universities providing analytical education where we can find analysts, look for staff that we need by following organizations like INFORM and quant research sites as we mentioned before and also develop relations with these organizations.

We should encourage our analysts to communicate with each other and organize networking activities. We should position persons working on the same subject so as to communicate easily with each other.

3. Stage 3 to Stage 4

In this stage, we should strengthen our relations with universities and organizations like INFORM by providing various sponsorships and internship opportunities in order to reach

analytical quality and guarantee forward recruitments. We should analyze the qualities of analysts and enable them to be kept up-to-date and learn new technology and tools by providing different advance training opportunities so as to improve them.

We should create awareness for our analysts with regard to work and for managers in terms of analytics. We should create larger teams in order that analyst employed in different periods and units can interact with each other. Thus, we will provide them to share solutions with each other by exchanging information and see the opportunities intended for use in company. In this stage, if it is possible, gathering some of the most capable analysts can create the first step for coordination.

5. Stage 4 to Stage 5

In this stage, analytics is an integral part of our company and competition point. We should provide all employees in our company to have analytical way of thinking. We should also provide our analysts to understand all business processes and see the big picture relating to the business by organizing different rotation programs, thus we provide them to aware the value that they create.

We should keep analysts out of the routine by charging them in compelling jobs which attract their attention and be sure that they get a reward of the job by configuring their performance evaluation so as to reflect their company expectations. Moreover, it is right time to create centralized analytical models and strengthen current models.

4. CHAPTER – ANALYTICS PRACTISES

4.1. Analytics on Web Data: The Original Big Data

Wouldn't it good to understand not only the customer actions but also the underlying purpose of his/her actions? To read his/her mind, thinking process, see almost his/her mind when deciding to purchase or not to purchase a product. Answering these questions in the past was not possible other than researches for comprehensive and expensive customer behavior to be made on a certain customer mass. Even so, limited results were taken with these researches. Now, this becomes possible with detailed analyze of web data.

For years it has been clear that web analytics holds the promise to truly revolutionize how business is done on the Web. And why not? You can track every click of every person on your site. How can that not be actionable? Unfortunately, the revolution has not quite panned out. The root cause is that analysts and marketers have taken a very limited view of data on the Web and have restricted it just to clickstream data[105]. In this part, we will talk about web data which may be the most used big data now and I will try to explain why to overthink about the usage of this data. I will mention that the evaluation of available web data together with the data gained from other business processes provides what kind of opportunities for organizations with regard to being customer-oriented and how to ensure the company to reach its strategic goals.

I guess that mentioning firstly the recent past is the best. Persons engaged in data previously withdrew vast amount of data in organizations from the system, treat them and transmit into the necessary points by using data warehouses and Business Intelligence (BI). Even if these operations were fairly complex operations on their basis, available data was not as developed as operations. Yes, organizations might know the customer address, name, telephone number, which product they bought from which company, how much it costed and when they bought this product through available customer data; but the available data was insufficient to understand completely the customer behavior and answer the mentioned questions. Now, while lots of organizations succeeded to intragrate detailed

[105] Avinash Kaushik, (2010),Web Analytics 2.0: The Art of Online Accountability & Science of Customer Centricity, Wiley Publishing, 2010,Indiana, USA, p. 22

customer behavior data that they gained from web sites with comprehensive customer data in their system, web integration that larger part had remained limited by sales.

Even if hundreds of metrics and report such as bounce rate, conversion, traffic sources, content which analytics programs present with regard to web data that Google Analytics and Yahoo used by many of us present are blowing our minds and even developing these reports by using many other metrics is possible, this data has not been used mostly except web reports. Additionally, this magnifical data is not sufficient to illimunate what the necessary actions are in order to develop our site by itself and make stronger connections with customers. There are still so many obstacles required to be overcome. This shows inconsistency in itself. No matter how much data there is, it may not serve to us in terms of understanding the business processes.

Some leading companies show that web data given the meaning and processed in detail has an unexplored value about understanding the customers. It is possible to understand than ever before the preferences and which factors determine the decision of our customer, how the course of purchase processes, not only the purchases but also the underlying purposes so as to combine information relating to other available customer instead of using only for web reporting and isolating the web data. This provides our company with a competition advantage that didn't have previously. Here we try to understand which data should be collected and how it helps us to understand which subjects.

4.2. What is Web Data and What Sorts of Oppurtunities is it expecting?

Main goal of companies has been to reach 360 degree customer viewpoint making easier to obtain the highest value of each customer by increasing the customer's brand loyalty while decreasing marketing costs and also to bring new and more profitable customers to their companies and aim at customers with the right product and services.

However, most company could not profit adequately from web data shown as an important step to reach this viewpoint. For example; let's consider a company which records only sales made. 95% of browsing sessions do not result in the creation of a shoping basket. Of the %5 that do, only about half, or 2.5% actually begin the checkout

process. And of that 2.5%, only two-thirds, or 1.7%, actually complete a purchase. These figures are not unrealistic in many cases.[106]

This shows us that the company can only observe 2% of data on a traditional web site in which only the sales made can be tracked. The rest data gets lost. This means that the data about the way followed by customer to purchase, the preferences that he/she made, deciding to purchase according to which criteria gets lost. However, this data is so precious and a source of data that never was available previously and can expand horizons for companies.

Before mentioning the use of web data expanding horizons for us in terms of the behaviors of customers, I think that mentioning even a little the history of this business, how it was performed before web data will be beneficial. In fact, if companies can reach address, telephone number and some demographic information relating to customers, this was sufficient to have a place among competitive player in the market. With the development of technology, some companies started to keep data about the latest product purchased, how often they purchase products from them and at what rate they spend. In the last 10 years, keeping data about transactions that customers make have become a standard in sector. However in fact, the goal to see 360 degree the customer that we mentioned before is a goal that cannot be reached, because 360 degree customer viewpoint means knowing everything about customer. Although sometimes companies claim that they reach 360 degree viewpoint, information to be collected and analyses to be made about customer are increasing and continue to increase day-by-day. Shopping that was made only from shops previously has been made on internet, mobile platforms and kiosks after then. Collecting thoughts of customers about our company on an immense environment like social media has started to become more important as the day goes on. For this reason, data is increasing continuously and whenever organizations say that they reach 360 degree customer viewpoint, new data and goals confront with them and the finish line is always moved forward. More realistic viewpoint tries to explain the situation such as that the goal

[106] Thomas H. Davenport, International Institute for Analytics, (2012), Enterprise Analytics: Optimize Performance, Process, and Decisions through Big Data, FT Press, New Jersey, USA, 2012 p.50.

of 360 degree customer viewpoint is to evaluate properly the available technology and data of company and obtain information about behaviors of customer.

The important thing is that companies combine information coming from other outlets so as to reveal its potential instead of examine in itself by isolating the data that they obtain from web. Information obtained by tracking transactions made in today's conditions of competition about what has been purchased at recent, how often the shop has been visited and how much customers has spent represents only a little part of the information to be obtained. Using new possibilities that web data will present to us is expecting innovative changes in competition.

Well then, what are these changes and which opportunities will their use provide? Firstly, it will be to the point to say that every company has different goals about opening/managing web site. For example; a blogger will try to understand how many visitors visiting his/her site continue to visit regularly his/her site, which subjects of his/her posts attract attention mostly, in which part of his/her site and in which specific posts visitors spend more times and which posts visitors deem worthy to make comments. However, the main goal of web site managed by a company carrying on retail industry is to make customer put his/her hand in his/her pocket and purchase. This is possible by evaluating customer trends and trying to understand, so the continuity of purchase behavior which is demanded can be provided. Well, what does the retailer want to understand? I guess that the first thing that he/she wants to understand is what percentage of visitors visiting the site purchase something and also wants to understand that visitor examine which parameters in his/her site. For example; did a mother purchasing baby food for her baby examine additives used and ingredients of this baby food when deciding? I wonder if a business man to purchase himself a suit considers that the product can be ironed easily or the cleaning type. Who read the extra information relating to the product? Our retailer can be close to customer as much as he/she can learn the products that customer decides to purchase at first and then cancel, which product groups are looked for, which specific products are interested, through which channel customer reaches our site.

Well then, what kind of opportunities does the web data provide with? For example; better service for customers can be provided on condition of optimizing the most used transactions by the exception of intense hours of transactions as a result of understanding the online behaviors of users. For example; if a credit card is looked for on recent view pages, we can find out if reward programs such as bonus offered by credit card or interest rate or annual fee attract customer's attention or we can create an extra income opportunity for our bank by offering our customer with opportunities that attract our customer's attention through different sale channels who makes search related to mortgages and credit instruments on our site.

Web data opens also new opportunity door within airlines. Imagine being able to identify every flight customers viewed before choosing their final itinerary. Imagine knowing if they cared more about price or convenience. Imagine knowing all the destinations they consider and when they first consider them.[107]

Finally, web data offers great advantages for telecommunication companies. For example; operator knows that customer reaches his/her site as a result of the question "How can I cancel my phone line of x's operator?" that he/she writes on Google. In this way, he/she has the chance to learn that customers visiting their site had viewed which sections and which models of telephone if they looked what kinds of tariff call they had made.

As you can see, web data is the type of data expecting various new opportunities and more different than available data sources. It provides us to reach information that other data sources related to customer preferences and the things that they will do in the future cannot provide us. It also make easier to understand customer's behaviors.

It is ideal that the organization collect all data coming from social media channels, our web site and kiosks, kiosks where customers use to reach our company as much as organization can reach data and technology. I'm giving the following graphic showing some information to be collected as a result of detailed review of data that customers produce.

[107] Bill Franks, (2012),Taming The Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics, John Wiley & Sons, New Jersey, p.33

Table 4.1. Big data collectable data types example

Purchases	Requesting help
Product views	Forwarding a link
Shopping basket additions	Posting a comment
Watching a video	Registering for a webinar
Accessing a download	Executing a search
Reading / writing a review	And many more!

Source: Bill Franks, "Taming The Big Data Tidal Wave:Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley & Sons, 2012, p.35

4.3. Things That Web Data Reveals

We can understand how our customers reach our web site thanks to the use of web data. For example; which search engines do most of our customers use to reach our site? While Yahoo is used in Japan, customers generally use Google in Turkey to reach our site or there is another special condition for our site. They reach us from which search results? For example; does the user that wants to purchase a telephone reaches our site as a result of a search for telephone brand or as a result of searches intended for the realized profit such as the lightest telephone or telephone having the longest charging time except the brand? Thus, for which words or word groups do we organize our advertisements to have the chance to understand to reach more easily customers that want to purchase our products? Additionally, we can see our users reaching us directly on condition of writing our web site address on their browser and we can understand with which products they identify our site by viewing what kinds of products they purchase. Then, we have the opportunity to be

preferred by them for more product groups and changing purchase behaviors by using predictive analytics methods.

Traditional use of web data concentrates on totals of sole session. For instance; how many people clicked our advertisement on x site, who reach us from search engines, how much we were paid per click or view, etc. Even if these metrics are benefitable in themselves, their benefit is limited as they reflect the things that customer has made in that session. However, if we expand web data in a way that it includes the things that user do within a specific time and deal it with other sale channels, we can reveal its potential. Companies predicting what customers will do tomorrow will move ahead in the competition. For example; understanding which advertisements attract customers providing the highest return is important for company strategy. For instance; an educational institution that I worked for a while gave advertisement to a site that you can watch online lesson related to programming training. In fact, user number visiting our site from this site was a considerable amount. On the other hand, their adversitement was being shown on a forum site that students followed. Visitor number from this site was limited, however we realized that people coming from student site were more eager to receive education from our institution and fill information forms on our site. In this situation, even if we take more visitors from one site, it is rational to make higher charging per click in order to give advertisement on forum site, because our advertisements on site giving service for students attract user's more attention and is more successful for directing them to purchase activity.

Likewise, it is important to realize what a visitor visiting our site for the first time purchase from our site within days or weeks. For example; let's suppose that customer follows our advertisement on a specific site and makes purchase. It is rational to evaluate purchases made on our site on the following days and months as a whole as the realized profit of advertisement clicked first.

Moreover, some products especially such as car-the ones which are expensive- should not be evaluated according to purchases that visitors that they attract make on web site. For example; user that wants to purchase x brand car will visit our site, but he/she will make

purchase most likely from dealer channel. In this situation, integration of web data with other sale channels becomes important.

Apart from that, as web data enable us to be closer to our customers than ever before, it also enables us to understand purchase behaviors from different point of view. For example; we can see our customers visiting our sites viewed which products, so even if they leave our site, we have the chance to let them have different opportunities relating to the products they viewed. For example; let's think a customer who views products relating to car loans on our bank web site. While it is normally impossible to realize that he/she purchase a car with his/her transactions in his/her bank accounts, savings and age, it is provided that customer representative can search customer in terms of low rate car loan and our company can evaluate an opportunity that could not be possible before by combining pages of which customer surfed on our site with available customer information after the participation of web data to the balance.

In the same way, information on the things that customers viewed related to products can be obtained. For example; while our tech-savvy customers who do not purchase without viewing the specifications will be searching detailed information on product, customers who give importance to design will look only images of the product and some customers who has already decided to purchase the product will make purchase only by searching product code. It is important to differ these customers. While imrovements are being made by giving place the specification just under the product for our tech-savvy users, viewing of larger dimensional image can be made instead of small images for our customers giving importance to design. For our customer who makes purchase directly, a navigation panel or search section to make them reach easier to the products they want can be helpful. Thus, web data can reveal to what our web data customers pay attention, to which options they pay attention while choosing products. It also enables us to understand customer preferences.

Apart from that, web data can be used in order to customer segments. Web data traditionally presents different viewpoint in comparison with the segmentation created according to the sales made and demographic used for creating customer segments. For

example; Consider a segment called the Dreamers that has been derived purely from browsing behavior. Dreamers repeatedly put an item in their basket, but then abandon it. Dreamers often add and abandon the same item many times. This may be especially true for a high value item like a TV or computer[108]. It is possible to distinguish this segment from others thanks to web data, so if we determine that our dreamy customers adding/deleting these expensive products to/from their bag preferred products with similar specifications but cheaper in the past thanks to web data, we can accelerate the purchase processes by sending them catalog to their mail box related to these products or offering cheaper products on our site.

Web data helps us to distinguish customers according to their positive purchase behaviors. Before telling how to use in order to evaluate the positive purchase behaviors, I think that it will be helpful to mention historical development of the process. If we start from the very beginning, the consumption frenzy starting in America as a result of 2nd World war and great depression was followed by other countries and became a trend rising gradually. Moreover, demands of customers for products and services increased and this resulted in many job opportunities being occurred. Problem became how to reach information about products to the most and the most proper people. From the very beginning, while hanging out a sign and advertising for our shop by sticking leaflets nearby if there had been other shops bringing competition in district were sufficient to receive feedback from customers, it was needed to make advertisement as a result of business enlarging and spreading on greater areas. Advertisements and radio jingles given to local paper and bill boards at the beginning were given to national channels in due time. With the result that more companies broke into market, direct marketing methods started to be used and products and offers were sent to customers via mail and in due course these mails were specialized according to customers and customer-centric organization models were created. Even so, it is difficult to segment customers according to response model and understand which customers will give positive response to offers made or if they are influenced by our advertisements or click our mails without web data. Because all customers in response

[108] Thomas H. Davenport, International Institute for Analytics, (2012), Enterprise Analytics: Optimize Performance, Process, and Decisions through Big Data, FT Press, New Jersey, USA, p.65.

models created were graded according to possibility to make action and most of customers were put in segments due to limited criteria. This situation causes all customers who do not shop and spend frequently to be evaluated in the same segment. However, with the use of web data, it is easier to distinguish these customer groups from each other.

For example; we can distinguish from each other the four customers taking the same score from response model created and showing similar purchase profiles according to the criteria such as their visits on our site, if they view the product presented in offer mails by clicking the link or view other products except the offered ones and also if they add product to their bag.

Additionally, web data gives the chance to provide mass product opportunities related to the product purchased instantly. For example; if customer purchase polish for his/her car instantly, we will be more effective by offering a package including cleansing milk, sponge and car odor in order to clean internal surfaces rather than making offers after purchasing the product by viewing, evaluating the up-selling opportunity before purchase.

4.4. Human Source Analytics

HR function was seen as an expense item by many companies in the beginning. This situation was accepted by most of HR workers dismissing the fact that a few people fought against this viewpoint. As mentioned in one of the books related to the subject, during that period, HR was simply a place where you put people ‘‘who couldn’t do any harm,’’ as a manager in my company said at the time[109]. Main reason of this viewpoint was that finance centered management mentality of the period and HR didn’t have any parameters to be used for evaluating the value added to the company. The terms used were far from being objective. The speech between managers mentioned by Dr. Jac Fitz-enz in his book and HR department had the quality to summarize the situation.

"How is employee morale?"

"It’s good!"

[109] Jac Fitz-Enz,(2010),The new HR analytics : predicting the economic value of your company’s human capital investments, AMACOM, New York, USA, p.xii

"How good?"

"Very good."[110]

In due course, HR kept up with the changes like all model in organization. It started to use quantitative and objective variables showing the added value for organization. Analytical tools that can be used in HR gained wide currency and so many organizations integrated Human Source Information Systems (HRIS) with their systems. Record basic HR transactions such as hiring date, compensation, promotions, and performance ratings. Some go well beyond that level, and record skill levels on a variety of aptitudes and learning programs undertaken to improve those skills. Companies increasingly have the ability to relate their investments in human capital to their returns on financial capital.[111] Even so, although organizations says always that "Our most important asset is our people" –Vehbi Koç and in fact even if the biggest spending item for most of them is HR, the great part offer only generic and basic operational and transactional measurements – metrics that provide little in the way of predictive data or actual insights that could have positive impact on the success of the organization.[112]

I guess that the most proper field will be sport teams in order to start to tell the use of HR analytics. Professional sport teams in our country and in the world come to the fore with million dollar transfer. The truth of the matter is that the most important investment and sole competition element of these teams are the players in their teams. Hence, they do not hesitate to use innovative methods providing advantages for themselves while evaluating abilities and choosing the players and maybe they are the professional sport teams in the industry using intensely the analytics approach in human resources. There are so many texts written on this subject, for example; Billy Beane general manager of Oakland A's in the film of Oscar-nominated Moneyball was unsung by other teams by spending less

[110] Jac Fitz-Enz, (2010),The new HR analytics : predicting the economic value of your company's human capital investments, AMACOM, New York, USA, p.xii

[111] Thomas H. Davenport, Jeanne G. Harris, (2007), Competing on Analytics, Harvard Business Press, Boston, USA, s.77.

[112] WEB_44, KPMG, (2013), People are the real numbers: HR analytics has come of age, http://www.kpmg.com/AU/en/IssuesAndInsights/ArticlesPublications/Documents/people-workforce-hr-analytics.pdf, 5/23/2014

cost than other teams with the HR analytics approach but he could succeed to lead his team to playoffs so as to gather the players having the right abilities. However, I want to tell about New England Patriots's analytics use succeeding to win 3 of recent 5 superbowls.

Football coaches are not mentioned generally as people trusting data and statistical methodology instead of their instincts. We all witnessed that especially football coaches in our country were punished by arbitrator to watch the match from the stadium due to discussion with arbitrator by getting involved in match. However, this situation has started to change gradually, at least for American Football. One of its examples is New England Patriots adopting firstly the team principle and being successful with a more different approach than other teams being active in National Football League (NFL). Firstly, the team makes selection from smaller colleges than the most successful colleges in which other teams frequently make selections and considers factors such as low personal ego and intelligence of players by using behavioral technics and metrics that other teams do not use while making selection. Thus, inclination of the player to team play and motivation sources are revealed. One can almost hear coach Bill Belichick asking prospective draft choices or free agents, "Tell me about a time that you were most satisfied with your college career," then listening for the themes of "we" and "me" to decide if they are a fit.[113] Due to these selections, you can see that the star player of team named Tom Brady mention frequently his team mates in the interviews and appropriate the success for the team. As Coach Bill Belich stated: "When you bring a player onto a team, you bring all that comes with him. You bring his attitude, his speed, strength, mental toughtness, quickness. Our evaluation is comprehensive Scott Pioli and the scouting department do a great job of getting a lot of details by going into the history of a player, his mental and physical makeup as well as attitude and character. He eventually receives one grade that establishes his overall value to the team"[114]

[113] WEB_45, Kriss Dunn, (2008),Why HR Should Love the New England Patriots, http://www.workforce.com/articles/why-hr-should-love-the-new-england-patriots, 5/24/2014

[114] James Lavin, (2005), Management Secrets of the New England Patriots, vol 2, Stamford, CT: Pointer Press, Connecticut, USA, p.159

Additionally, the system in which the Patriots keep data about potential players is updated with reports coming daily in order to minimize the failure rate in their selections. Points of players coming from different schools are entered into the system after converting into just one point type to facilitate to make comparison between players according to the west or east side.

As of 2013, number of people employed in Turkey has exceeded 26 million[115]. If we consider that the biggest expenses of many companies are wages given to the employees, roughly billions of dollar wage payment is made. For this reason, the importance of talent analytics is increasing day by day. According to the research made by Gartner, BigData and analytics will produce service and product amounted 3.7 trillion $ and provide 4.4 million new job opportunities. When asking to HR managers what their priorities are, evaluating and predicting the performance of employee are in top 3. Well, is it possible to use data relating to demographics, performance evaluations, trainings provided and academic performances of employees gained as a result of varios organization activities in order to increase the performance of employees or employ the right persons at the beginning?

The participative author of Forbes magazine mentioned in one of his articles that one of the great financial service companies which was a customer of Josh Bersin, founder of Bersin by Deloitte, used HR data to enhance the performance of employees. Here I can tell about the company mentioned in the article. As the company think that the ones who have the best grade point average and graduate from the best colleges show the best performance, it performs its selection and promotion process in line with this viewpoint. The viewpoint such as the better and brighter academic background they have, the more successful they are brought the company to this point. However, the following results were reached as a result of sale analyses depending upon the variables such as rates of analysts' leaves from the company, demographic factors and total performances.

[115] TUİK, (2013), Hanehalkı İşgücü İstatistikleri, Haziran 2013, Sayı:13590, Sept 16 2013

Figure 4.1. How to select best sale professionals

Source: Josh Bersin, "Big Data in Human Sources:Talent Analytics Comes of Age", Forbes ,17.2.2013, <http://www.forbes.com/sites/joshbersin/2013/02/17/bigdata-in-human-Sources-talent-analytics-comes-of-age/>

As you can see, in fact there has no validity that the company has made relation between the best grades and the best colleges and sale rates. BigData points out that the most successful sellers are the ones who give importance to punctuation-orthography, did not leave school before obtaining diplome, have experience on sale of house and car and lots of other qualifications. Once this data was put back into the recruiting process, the company saw more than $4M improvement in revenues in the next fiscal period. [116] Additionally, as a result of analyses made in companies such as AT&T and Google, they did not find any

[116] WEB_46, Josh Bersin, (2013) ,Big Data in Human Sources:Talent Analytics Comes of Age, Forbes ,17.2.2013, http://www.forbes.com/sites/joshbersin/2013/02/17/bigdata-in-human-Sources-talent-analytics-comes-of-age/, 5/25/2014

relations between academic success and the performance at work such as financial service company that we mentioned above, but they have reached the result that taking initiative is a crucial sign for high performance.

Another company taking serious HR analytics is Sprint providing global voice, data and internet. Sprint is the one of 4 four companies which dominates the American wireless communication market. Moreover, it uses its ability in terms of modeling of cause and effect relationship obtained as a result of intense analytic use in order to invent innovative programs to keep the customer loyalty at highest level and also maintain the available programs. In fact, the company assumed the title of the sole company showing regular development during the last 2 years according to 2012 The American Customer Satisfaction Index in American-wide in terms of customer loyalty.

HR department of the company realized that employee relations progressed within a similar cycle with customer relations. They wanted to apply a similar model in HR by considering the success in customer relations management. For this reason, customer relations department and HR department adapted 6 step customer relations program to HR by working together. These 6 stages stated in Competing in Analytics of Thoman Davenport and questions in each stage are as follows.

Table 4.4. Sprint 6 step HR management

How do employees learn about Sprint?
How do we make sure we find and hire the most qualified candidates?
How are we going to get the employee up and running and get them productive?
How are we going to get them their first paycheck and make sure they are happy with that first paycheck?
How are we going to intervene when the employee is unhappy?
And how are we going to get the employee recommited year after year to business?

Source: Thomas H. Davenport, Jeanne G. Harris; “Competing on Analytics”, Harvard Business Press, 2007, s.79.

Another sector used for recruitment HR analytics and keeping employess is the health sector. The sector is faced with all problems available in other sectors and also faced with problems resulting from their own dynamics. First of all, qualified nurses and doctors are progressively needed in this sector. Moreover, it is impossible to meet this demand by importing employees from foreign countries due to the laws. Even if it is possible, this a long and problematic process due to detailed test periods and slow bureaucratic courses. Additionally, it is required to be ready for spending extra effort in order that HR department can keep the employees due to 24/7 shifting hours, guard duty and high stress by virtue of the nature of work. In spite of this, most HR departments of these institutions are using local database and this prevents HR from evaluation with other functions of the organization. This situation results in organizational work load, performance and financial problems when combining with increasing service requirements, ever-aging staff and workforce limits. Thus, the most important problem expected for the health sector seems like human resources management. It is important to provide the pleasure of employees and employ the right person while analyzing the right metric enables patients to have pleasure from the service. I will be mentioning through this part how to prioritize the operations by using predictive metrics and which advantages they can provide for long term company strategy.

Organizations carrying out business in health sector have the chance to give reaction before the events occur by using predictive models. Thus, they can catch the competition advantage by predicting the opportunities and problems in the sector. This enables company to work more efficiently and effectively. Here I will try to give details about the subject by mentioning the customer satisfaction and predictive analytics used in HR field of health giant's United Health Group (UHG) having 110,6 billion dollar[117] income in 2012, giving service in 20 different countries and 50 American states to more than 85 million people at 3200 hospitals with more than 340 thousands doctors.

[117] Web_47, United Health Group, http://www.unitedhealthgroup.com/About/Default.aspx, 5/25/2014

According to Michelle Fernando, Manager, International Recruitment Operations, the company faces many human capital management challenges in today's health-care environment. These include improving the quality of care and patient satisfaction while decreasing costs in an environment where hiring is an ongoing concern.[118] In fact, managing workforce so as to provide the highest performance, choosing and keeping the most skilled people right for the job provide both a financial and operational competition advantage. For this reason, UHG decided to use predictive metrics. Another reason for deciding to use predictive metrics was that HR managers from different countries and states reported recruitment metrics in different ways. Differences in reports and plurality of reports resulted in waste of time in order to provide data consistency and it was a matter of making job again and again due to the conflicting reports.

It became more important to keep high the employees' determination, make happy and keep them due to market mobility, plurality of carrier opportunities and specialized health sector in the country in the braches of UHG located in developing countries such as India and a new way was provided to evaluate and improve predictive metrics and methodology processes used by the company as well. On the other hand, UHG's growth rate is required to employ new staff continuously and evaluate the applications consistently. Do the applications provide the required qualifications? Have they the required abilities and experiences? Are they suitable for organization culture? At the same time, it was required to evaluate the requirements that may be occurred in the future and the performance of employees on the basis of departments. To be short, the company needed effective solutions for determining and solving problems to be arisen. Additionally, *according to Fernando ''HR* reports were also done manually and requests were taking too long to fulfill. This was translating into increasing costs, inconsistent business information, and reduced productivity,''

In order to solve these problems, UHG worked with Taleo who is talent management solution provider. Within the frame of work with Taleo, company could make more right

[118] Jac Fitz-Enz ,(2010),The new HR analytics : predicting the economic value of your company's human capital investments, AMACOM, New York, USA, p.267

decisions relating to workforce by using predictive analytics. Thus, they could determine previously the processes requiring to improve and opportunities in courses of recruitment. Thanks to the system, it was easier to check the skills of applicants and their suitability for job and observed that there was an increase in the qualities of the employed staff. Moreover, with the help of the dashboard data related to staff recruiting and keeping them could be downloaded to the computers of employees and reviewed.

In order to be sure that it applies the right strategies of recruiting and keeping staff, UHG is using a technology platform that helps capture the desired job knowledge metrics and requirements and match them to the skills, competencies, acknowledge of the candidates—all from a centralized global database. This is accomplished using four key metrics or measurements: quality of hire, source of hire, percentage of internal hires, and system utilization. These metrics enable them to ensure competent, qualified staff and high staff retention rates.[119]

The example of quality of hire from these metrics tries to understand how accurate preferences the recruited staff is, depending upon the suitability of recruited staff to the organization culture, how rapid they adapt themselves to new positions and their experiences. Thus, keeping rates of employees can be increased by avoiding the staff having the possibility to leave after a while of recruitment and their productivity can be maximized by keeping their eager to work at the top level as the proper applicant has been chosen. As happy staff in practice has better relations with their colleagues, it was seen that there was a decrease in leaving rates.

Source of hire metric made easier to follow basic sources used in global recruitment courses for the company. Thus, companies and organizations sending successful applicants to the company were understood, from which company our high performance employees came became apparent. Thus, the organization can make recruitments more correctly day by day by determining which sources should be aimed for the following recruitments. Moreover, in order to make possible all these analytics works, we needed to continue single

[119] Jac Fitz-Enz, (2010),The new HR analytics : predicting the economic value of your company's human capital investments, AMACOM, New York, USA, p.268

data approach as we mentioned before. In order to make possible the sole truth, company center established a reporting portal. Thus, reviewing a sole report set produced globally according to regions by filtering and consistency of metrics with each other were provided. There reports updated daily provide correct and consistent organizational reports and access to current HR data for its users. Moreover, it was made easier to understand the report and what the meaning of each metric was for employees by adding detailed explanations of metrics in reports to each report. ‘‘We really needed to be more methodical and analytical about our use of HR technology,’’ says Fernando. ‘‘The enhancements we have made help UnitedHealth Group to better analyze employee turnover trends and the effects of this turnover throughout our entire organization.’’[120]

4.4.1. Google Project Oxygen

It would be wrong if HR analyrics practices ended without mentioning Google. I will make summary of the case study named Google’s Project Oxygen: Do Managers Matter made by Harvard Business School in this section.

Google founded by Sergey Brin and Larry Page who were two doctorate students from Stanford University in 1998 gained a great success among search engines thanks to its innovative algorithm listing according to link number that they took from other sites. The company institutionalized after taking 26 million dollar investment from inverstors in 1999 and moved its headquarters to California, Mountain View. The company having employees using exercise balls instead of chairs, letting dogs in the workplace, buffets, offices full of toys has a culture encouraging innovation, eliminating the barriers for improving ideas rapidly and encouraging cooperation.

In 2000, Google became a company responding to 100 million searches daily by getting strong with partnering contracts which it made with Yahoo and AOL and succeeded to begin the year of 2001 as a profitable company by catching higher click rates than industry average with AdWords program at which words to be given advertisement created in the same year for the one who gives advertisements can be aimed. With the increasing demand

[120] Jac Fitz-Enz,(2010), The new HR analytics : predicting the economic value of your company’s human capital investments, AMACOM, New York, USA, p.270

for the service of Google Adwords, it made an annual 440 million dollar turnover and 100 million dollar profit in 2002. With public offering in 2004, it collected 2 billion dollar from market. It obtained an annual 38 billion dollar turnover and nearly 10 billion dollar profit in 2011 as growing in every year. Moreover, by purchasing Youtube and Motorola after public offering (it was sold out later, but it has been thought that this purchase made great contributions to Android operating system developed thanks to patents obtained and strengthened its hand against Apple) and its other products (Gmail, Chrome, Google Docs), it strengthened its role in market and increased its popularity and also created new sources besides income which it obtained from search ads that were main income item. Google is obtaining today half of its total income from activities outside of America.

The following graphic shows the financial statement of Google between 2001-2012.

Table 4.4.1 Google 2001-2012 financial statement

For the Fiscal Period Ending	12 months Dec-31-2001	12 months Dec-31-2002	12 months Dec-31-2003	12 months Dec-31-2004	12 months Dec-31-2005	12 months Dec-31-2006	12 months Dec-31-2007	12 months Dec-31-2008	12 months Dec-31-2009	12 months Dec-31-2010	12 months Dec-31-2011	12 months Dec-31-2012
Total Revenue	86.4	439.5	1,465.9	3,189.2	6,138.6	10,604.9	16,594.0	21,796.0	23,651.0	29,321.0	37,905.0	50,175.0
Cost Of Goods Sold	15.1	132.6	634.4	1,469.0	2,577.1	4,225.0	6,649.1	8,622.0	8,844.0	10,417.0	13,188.0	20,505.0
Gross Profit	71.3	306.9	831.5	1,720.3	3,561.5	6,379.9	9,944.9	13,174.0	14,807.0	18,904.0	24,717.0	29,670.0
Selling General & Admin Exp.	39.4	80.0	259.5	483.9	854.7	1,601.3	2,740.5	3,749.0	3,652.0	4,761.0	7,313.0	9,691.0
R & D Exp.	20.9	40.5	218.0	383.8	599.5	1,228.6	2,120.0	2,793.0	2,843.0	3,762.0	5,162.0	6,593.0
Other Operating Exp., Total	60.4	120.5	477.4	867.7	1,454.2	2,829.9	4,860.5	6,542.0	6,495.0	8,523.0	12,475.0	16,284.0
Operating Income	11.0	186.5	354.1	852.5	2,107.3	3,550.0	5,084.4	6,632.0	8,312.0	10,381.0	12,242.0	13,386.0
Interest Expense	(1.8)	(2.6)	(1.9)	(0.9)	(0.8)	-	-	-	-	(5.0)	(58.0)	(84.0)
Interest and Invest. Income	0.9	1.2	2.7	16.0	121.0	412.1	559.2	390.0	230.0	579.0	812.0	713.0
Net Interest Exp.	(0.9)	(1.4)	0.7	15.1	120.3	412.1	559.2	390.0	230.0	574.0	754.0	629.0
Earnings Before Taxes	10.1	184.9	346.7	650.2	2,141.7	4,011.0	5,674.0	5,853.0	8,381.0	10,796.0	12,326.0	13,386.0
Net Income	7.0	99.7	105.6	399.1	1,465.4	3,077.4	4,203.7	4,227.0	6,520.0	8,505.0	9,737.0	10,737.0
Net Income as a % of Revenues	8.1%	22.7%	7.2%	12.5%	23.9%	29.0%	25.3%	19.4%	27.6%	29.0%	25.7%	21.4%
Per Share Items												
Basic EPS	$0.07	$0.86	$0.77	$2.07	$5.31	$10.21	$13.53	$13.46	$20.62	$26.69	$30.17	$32.81
Supplemental Operating Expense Items												
Advertising Exp.	5.3	5.6	20.9	37.7	104.3	188.4	236.7	266.0	353.0	772.0	1,544.0	2,332.0
Selling and Marketing Exp.	21.7	48.8	164.9	295.7	468.2	849.5	1,461.3	1,946.0	1,984.0	2,799.0	4,589.0	6,012.0
General and Administrative Exp.	17.7	31.2	94.5	188.2	386.5	751.8	1,279.3	1,803.0	1,668.0	1,962.0	2,724.0	3,679.0
R&D Exp.	20.9	40.5	229.6	395.2	599.5	1,228.6	2,120.0	2,793.0	2,843.0	3,762.0	5,162.0	6,793.0
Google International Revenues as a % of Google Revenues	18%	22%	29%	34%	39%	43%	48%	51%	53%	52%	54%	54%
End of Year Permanent Headcount (Google Stand-alone)	284	682	1,628	3,021	5,680	10,674	16,805	20,222	19,835	24,400	32,467	37,544
Google Motorola Headcount												16,317

Source: Financial data provided by S&P Capital IQ, Employee data from Google website

Additionally, Google having 3000 employees in the course of public offering reached 35.000 employees by multiplying 10 times its employees in 2012. Software Engineer Eric Flatt summarized the company culture of Google giving higher value to engineers and dominated by engineers by saying that "We are a company built by engineers for engineers"[121]. Decisions in Google are made as a result of mutual consent and it has a flat organization structure. Due to this flat structure, it is normal that lots of employees have similar duties, as Google had relatively few managers (5,000), directors (1,000), and vice presidents (100), compared to other companies of similar size. It was not uncommon to find engineering managers with 30 direct reports. Flatt observed, "Management in the engineering organization is highly constrained, by design. There is only so much you can meddle when you have 30 people on your team, so you have to focus on creating the best environment for engineers to make things happen."[122]

While increasing staff number and flat organization structure has been continuing to make things difficult for managers, discussions on how important the managers are for the system from the very beginning at Google has been in progress. As the director of engineering Nadav Eiron explained, "Engineers generally want to spend their time coding and debugging. Many think that talking to direct reports gets in the way of getting that work done. And without training, some engineering managers have a hard time striking a balance between providing direction and micro-managing."[123] At the same time, a lot of engineers have been questioning the purpose of existence of managers not only at Google but also at many other engineering companies. Jennifer Kurkoski working as analytics manager at Google explains the situation as follows: "There are many engineers ─ not just at Google ─ who tend to think that managers are, at best, a necessary evil, and at worst, are destructive."[124] Page and Brin who are engineers and founding partners of the company

[121] David A. Garvin, Alison Berkley Wagonfeld, Liz Kind, (2013), Google's Project Oxygen:Do Managers Matter; Harvard Business School, April 3, p.2
[122] David A. Garvin, Alison Berkley Wagonfeld, Liz Kind, (2013), Google's Project Oxygen:Do Managers Matter; Harvard Business School, April 3, p.2
[123] David A. Garvin, Alison Berkley Wagonfeld, Liz Kind, (2013), Google's Project Oxygen:Do Managers Matter; Harvard Business School, April 3, p.3
[124] David A. Garvin, Alison Berkley Wagonfeld, Liz Kind, (2013), Google's Project Oxygen:Do Managers Matter; Harvard Business School, April 3, p.3

was a party to this discussion and they questioned if managers were required or not. In 2002, while company were employing a few hundred engineers and all was giving reports to different four managers, they made a 2-3 month trial in order to understand if a flat organization without managers was possible or not. However, they ended this trial in a short time due to the crowd of people coming to them in order to solve their personal problems and approve internal expenses.

Google relied on analytics methods in order to maintain this rising trend catched in a short time and manage ideally rapidly increasing number of staff. In order to guarantee that each employed person is the best, it evaluates each resumé according to the success factors determined according to the common qualifications of successful employees in the company. It tries to prefer applicants to show the highest performance and adapt easily to the company culture on condition of reevaluation according to whether they have the qualities such as taking initiative, flexibility, making group actions. It has been a model for sector with the analytic methods used for recruitment processes that we mentioned before.

Google managers are agreed on that these recruitment methods applied have a great impact on the company success. Right recruitments helped to create and maintain a culture where good ideas are celebrated and authority and employees have a respect for each other, there are employees loving their job, dedicating themselves to their job, spending efforts to reach the perfect and supporting each other.

Chris Loux, head of global enterprise renewals comments on how managers manage in this system. "Managers here fail if they rely only on the authority of their position. Google has many young, high achievers who crave autonomy."[125] Additionally, this is a common condition that an employee gives reports to three different managers within two year working period in a dynamic structure making possible to direct rapidly the employees to the required fields, which is applied by Google.

In spite of all these dynamic structure and management difficulties, as Page one of Google founders stated "My job as a leader is to make sure everybody in the company has

[125] David A. Garvin, Alison Berkley Wagonfeld, Liz Kind, (2013), Google's Project Oxygen:Do Managers Matter; Harvard Business School, April 3, p.3

great opportunities, and that they feel they're having a meaningful impact and are contributing to the good of society….I don't think it's any of [the individual lifestyle perks]. It's important that the company be a family…We should continue to innovate in our relationship with our employees and figure out the best things we can do for them."[126]

Page and Brin gave a great importance to human resources at Google from the very beginning and be beyond a department to make performace evaluations and regulate the wages. As stated by a reporter "At the heart of [people ops] is a sophisticated employee-data tracking program, and an effort to gain empirical certainty about every aspect of Google's workers' lives — not just the right level of pay and benefits but also such trivial-sounding details as the optimal size and shape of the cafeteria tables and the length of the lunch lines."[127] They struggled to be a department to benefit from the available data and give the meaning of findings obtained. Bock employed for managing the Human Source unit changed the name of unit as people operations and transferred Setty from Capital One famous with her analytic studies in terms of human resources to create people analytics group within people operations. Bock employed Setty in order to apply in human resources unit the discipline and methodology that she applied in business operations unit. Setty mentions the duty of her group as follows: "I didn't want our group to be simply a reporting house. Organizations can get bogged down in all that data. Instead, I wanted us to be hypothesis-driven and help solve company problems and questions with data"[128] Mission of this new established unit which was described in a way that all decisions would be made by using data was defined again in a way that all decisions would be supported by using data. Setty tells about this condition as: We want to use data to eliminate bias in decision-making, but we don't want data to completely erase the role of personal judgment. A few years ago, we ran an experiment in which we tried to use data to determine which engineers should be promoted. Managers weren't comfortable with that approach. They wanted data

[126] Adam Lashinsky, Larry Page: Google Should be Like a Family, Fortune, February 6, 2012
[127] WEB_48, Farhad Manjoo, How Google Became Such a Great Place to Work, Slate.com, January 21, 2013, http://www.slate.com/articles/technology/technology/2013/01/google_people_operations_the_secrets_of_the_world_s_most_scientific_human.html, 5/26/2014
[128] David A. Garvin, Alison Berkley Wagonfeld, Liz Kind, (2013), Google's Project Oxygen: Do Managers Matter; Harvard Business School, April 3, p.4

to help them make better decisions, but they didn't want a 'black box' that used data to arrive at answers without human input[129]

People&innovation lab (pilab) created by Kurboski, Briand Welle and Neal Patel from people analytics team consisting of PhD's established by Setty came up. This team working for happiness and productivity of employees put forward a research subject about how important the managers are in the meeting that they made with Setty on research subjects. Then, the foundations of Project Oxygen were laid.

Research subject recommended by Pilab about how important the managers are, underlied the extensive study starting at the end of 2009 by people analytics group. This research directed by Pilab comprising Patel, Donovan and Kurkovski was named as Project Oxygen. By the way, besides the difficulties of research subject, Google's management approach requiring reliable proofs made the things more difficult. Patel summarizes this situation as: "We knew the team had to be careful. Google has high standards of proof, even for what, at other places, might be considered obvious truths. Simple correlations weren't going to be enough. So, we actually ended up trying to prove the opposite case; that managers don't matter. Luckily, we failed."[130]

Pilab started its works about the importance of managers by reviewing available forms in which employees leaving from Google filled the reason of their leave. Their purpose of reviewing these forms is to find problems arising from management among leaving reasons and reveal if there is a relation between low employee's pleasure and leaves. However, low leaving rates in the company gives the impression to the team which is insufficient to reach statistical correlation of available data and generalize the employees working at Google. Moreover, even if correlation between employee's manager pleasure and leaves was found, it is not sufficient to say that the reason of leaving is the manager. For this reason, Patel created a grade scale for managers according to the questionnaire that Google employees filled and the performance evaluations and repeated the study about the importance of

[129] David A. Garvin, Alison Berkley Wagonfeld, Liz Kind, (2013), Google's Project Oxygen: Do Managers Matter; Harvard Business School, April 3, p.4
[130] David A. Garvin, Alison Berkley Wagonfeld, Liz Kind, (2013), Google's Project Oxygen: Do Managers Matter; Harvard Business School, April 3, p.5

managers by separating the part of 25% at the top as higher graded managers and the part of 25% at the bottom as low graded managers. He cites the study and research as follows.

At first, the numbers were not encouraging. Even the low scoring managers were doing pretty well. How could we find evidence that better management mattered when all managers seemed so similar? There was really no reason to expect any differences in team performance or team member satisfaction between the two, ostensibly similar, groups. But since we didn't expect to find any differences, even small differences were impressive. It turned out that the smallest incremental increases in manager quality were quite powerful. Good managers do matter.[131]

These proofs found regarding that there were non-ignorable effects of high graded managers on employee's pleasure and performance excited the whole team and it was really observed that employees in high graded manager teams were more pleased and their leaving rates were lower. 2008 Google data presented that the effect of seniority, performance and promotions on leaving rates was lower than the effect of manager. In addition to this, pilab presented that teams managed by high graded managers were generally more successful than the ones managed by low graded managers in term of innovation, work/private life balance and carrier development.

As a result of these studies, it was reached that the managers were important. However, this has no meaning as long as the reached results could not find an answer to the question of what distinguish good managers from bad ones. 8 behaviors and explanations are given below as a result of the study that Google made about what distinguish good managers from bad ones.

Source: Meghan Casserly, "Google's Failed Quest To Prove Managers Are Evil -- And Why You Should Care", 7/17/2013, Forbes

[131] David A. Garvin, Alison Berkley Wagonfeld, Liz Kind, (2013), Google's Project Oxygen: Do Managers Matter; Harvard Business School, April 3, p.5

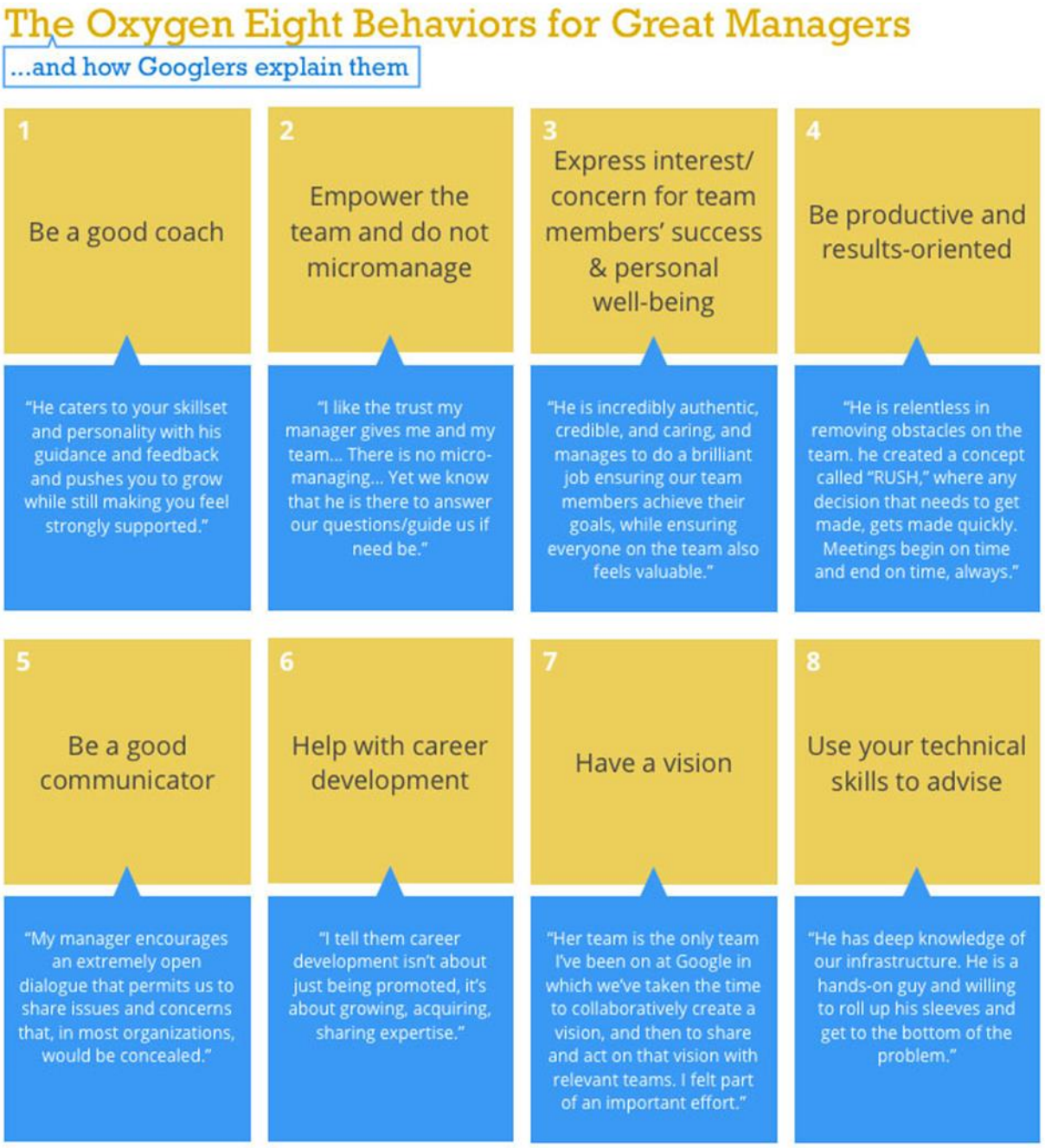


Figure 4.2. Oxygen project eight management behavior model

Source: Meghan Casserly, "Google's Failed Quest To Prove Managers Are Evil -- And Why You Should Care", 7/17/2013, Forbes

The determinations related to 8 ways of behavior which separates the good executives from bad executives came up as a result of interviews of Pilab done in the summer of 2009 with the executives who gained low and high scores. In these interviews, the executives are asked how often they talk with employees about career development, which way they choose to develop a team vision and by analyzing the results obtained, the 8 ways of behavior are determined which separates the executives who obtained high scores from others.

After determining the behaviors which the good executives are sharing, an action plan is constituted by people operations unit for that these kind of behaviors spread all across the firm, The questionnaires are created in which how much of the specified qualities does the executives have reviewed by employees and the great manager program with which the best executives are awarded is modified for reflecting this 8 criterias. It is expected afterwards by the winner's of this prize which includes every year 20 winner executives for one week passing the time with Google's senior level executives in a destination like Hawaii, to be a role model and to share their experiences via different channels with Google employees. Claybers points out this expectation: "It was amazing to spend a week in Hawaii with cool, fantastic people. Since then, I've been spending time coaching other managers. Recipients of the awards are expected to give back."[132]

In addition to those, training programs facing oxygen criterias designed by the people operations department towards the end of 2010 and a few months later with the results of the project oxygen questionnaire it is presented to the executives as a proposal for self-development. For example, an executive who got low score on coaching subject can register to coaching education via a link found at the evaluation report's suggestions part reached online. These educations are designed interactively and also it gives to participants chance to test their acquired knowledge. For example, Coaching classes offered detailed

[132] David A. Garvin, Alison Berkley Wagonfeld, Liz Kind; Google's Project Oxygen:Do Managers Matter; Harvard Business School, April 3, 2013, p.9

recommendations on how to deliver personalized, balanced feedback. They also provided opportunities for employees to role play and practice giving and receiving feedback. "Vision" classes used a series of images to encourage creativity. Participants were encouraged to bring ideas to life by telling a compelling story and practicing writing their own vision statements[133]

As a result of the studies it can be seen that the executives who got low notes show the biggest improvement and the results of the questionnaires which is held among the engineer and sales groups changed 83% positive to 88% positive[134].

[133] David A. Garvin, Alison Berkley Wagonfeld, Liz Kind, (2013), Google's Project Oxygen:Do Managers Matter; Harvard Business School, April 3, p.8

[134] David A. Garvin, (2013), How Google Sold Its Engineers on Management, Harvard Business Review, December p.7

5. CHAPTER – THE FUTURE OF ANALYTIC COMPETITION

Throughout the thesis, I tried to explain as much as I can by showing examples to the firms who use analytic methodology for creating competitive advantage the domains on which they use analytic for taking advantage. It is discussed that in today's world, the key to the success is related to making the millions, sometimes billions of large and small operational decisions and some of the firms which are archetypal with their analytic applications and complex models they have in sector. In thıs section we will mention the trends which will form the future and we will underline the competitive firms and what will they do different in the future.

As the famous speaker and American businessman Robert Kiyosaki says; '' your future is created by what you do today not tomorrow''. To this point we mentioned a lot of firms and their methods for taking advantage by differentiating their products and services and it would be not wrong to say that these methods mentioned will become widespread and the actually using models will be ameliorated further. In the future, more and more firms will identify itself as an analytic competitive and will take lesson from the firm's actual experiences for that they chosen this way. Today's analytic leaders will raise the job processes in the future in which they use analytic. It should not be forgotten that, ıf a job deserves to be done, it worth to make solutions analytically. For the sectors in which the analytical methodology isn't adopted yet, new trends and approaches will enable different analytic applications. For example, in the sector of mode based on personal tastes which we mentioned before, today only just a firm compete analytically, maybe tomorrow all of the firms shall follow this trend and for the sectors in which there isn't any analytic application will explore new methods and analytic competitive firms will derive.

In this part of the thesis, I will analyze what the analytic future will bring as articled.

5.1. Application Layer

The possessed business intelligence tools are spreading and becoming cheaper day by day. We can say that in the future, software suits which ease reporting and making simple analyses on the data will become a standard issue. For example Microsoft made the addings presented below related to Office family business mind and at the same way the solutions Jaspersoft (www.jaspersoft.com) and Pentaho (www.pentaho.com) who got open sourced business mind solutions are becoming popular. In the future it seems possible for the small scale enterprises to reach more talented business mind tools more cheaper or for free. It can be said that the packets who ensure the most sophisticated features will stay expensive as usual.

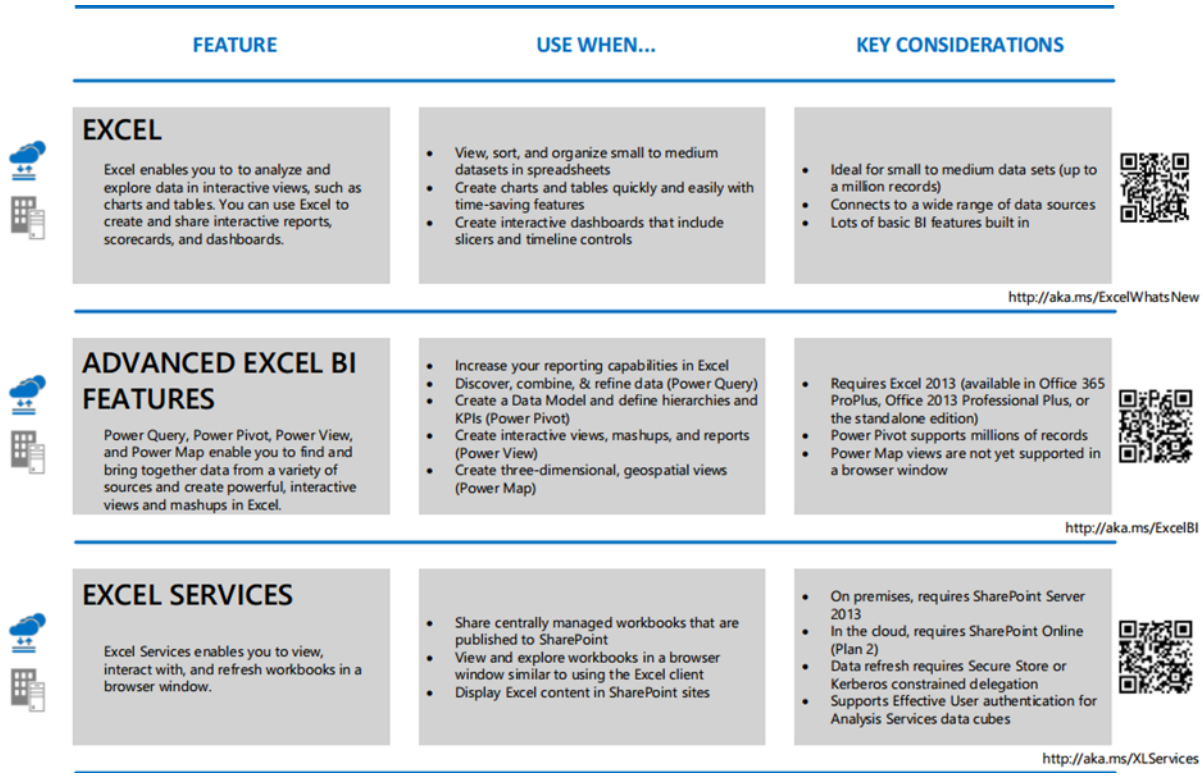


Figure 5.1. Office family BI property list

Source: http://officeimg.vo.msecnd.net/en-001/files/500/002/AF104215773.pdf

5.2. Dedicated equipment usage

Parallelly to the raise of the data by the managements to which they can reach and produce, The demand to IBM Netezza and Oracle's Exadata, optimized for BI applications MPP(massively parallel processing) 'data warehouse' will raise. These database's most significant difference from SMP(symmetric multiprocessing)[135] is that each of it compose of node's independent and adequate in itself and for this reason it make possible to change the components which doesn't work properly, this pattern is called ''shared nothing architecture'' . Besides, for the reason of processor power and place requirement contrary to the structure which requires to pass to a new server, in this system we can expand our database by adding new node's, these systems which allows big caliber query to work parallelly makes it possible for analysts to reach details in the quickest way.

5.3. Automated and real – time decision making systems

Studies on American economy showed us that investments made to informatics contributed to the company productivity. For example, since 1995, productivity growth in the United Stated has averaged more than 2.5 percent per year, compared with the average growth rate of about 1.4 percent per year over the preceding twenty years[135]

The decision making system, instead of trusting to humans for making decisions by looking to the details on hand for the decisions made, it adds analytic process to job process to automatize the decisions as far as possible. Thus, the sudden decisions can be made on the timetable specified by management with reducing the needed time for conclude the data and so the managements can take the data from the needed systems and treat them analytically. This is one of factors which support sustainable performance and economic growth.

Hereby I'm giving place to case studies of two firms which are contributed to productivity and profitableness of the firm by automatizing the decisions

[135] Chairman of the Council of Economic Advisors, The Economic Report of the President, 2007

Case Study: An Insurance Company Increased Revenue by 35 Percent with the Same Number of Staff

With more automation and more sophisticated decision management systems running inside companies in the future, we expect to see more operational managers making fewer micro decisions related to their particular responsibility. As a result, they will be able to use more of their time and talent to be more creative and to think about how their decisions fit into the larger corporate picture.With more of the day-to-day decisions automated, they can take responsibility for more decisions that contribute to the competitive position of the business.

For example, one of the largest auto insurers in Michigan changed in the last few years from using its centralized group of underwriters who manually reviewed all insurance policy applications to a process where they review only 1 percent of those applications. Once the automated decision management system was installed, underwriters turned their attention from evaluating individual policies to helping agents with their blocks of business. This led to a tripling of independent agents and a 35-percent increase in revenue, with the same number of staff. The automation required analytics and coding of three thousand business rules into a rules management system.

Source: Larry Rosenberger and John Nash with Ann Graham,"The Deciding Factor: The Power of Analytics to Make Every Decision a Winner", Jossey-Bass, 2009, p.151

Case Study: Air Products Reduced Product Development Time from Forty-Five Days to One Day

Another Fair Isaac client, Air Products is a U.S.-based producer of specialty gases, performance materials, and equipment and services for industrial and health care markets worldwide. The company embedded the expertise and decisions of hundreds of dispersed product configuration specialist into a decision management system to speed the flow of materials and end products to the customer, systematically capturing decisions that specialist formerly made regarding such things as the sources of gases, recipes for mixing gases, and inspection routines for different mixes. Previously, the process required multiple layers of approval for complex configurations. Also, configuration experts are hard to hire and train because their knowledge is so specialized. Automating the decision process reduced the product creation cycle time from forty-five days to a single day

Although rules-based expert systems first appeared a number of years ago, the newer systems, such as the one deployed by Air Products, has qualities the earlier systems did not. In particular, it is not a stand-alone application, and the new knowledge it captures is used to improve the product creation process.

Source: Larry Rosenberger and John Nash with Ann Graham,"The Deciding Factor: The Power of Analytics to Make Every Decision a Winner", Jossey-Bass, 2009, p.152

As you can see the automobile insurance firm who automatize the policy creation process, with as much amount of personnel it made raise at incomes at a rate of 35 %. The other firm interested in technical gases reduced the 45 days of product creation to 1 day by automatizing the process. As we mentioned before, the automatized real-time analytic using and decision making systems which these firms are using will spread more and more in the future.

5.4. Increase in usage of the alarms and Visual Analytics

Contrary to expecting to take actions related to the processes which isn't stays between the stated values by reviewing the rapports of executives for the job processes, for the reason that workload of the executives or by their carelessness there may be escaper data. The alerts are the kind of messages which are automatized and it is based upon the alert system to take action by system's decision makers when one of the processes goes out of patterns. For example, the alerting of store manager when the stock levels reach a critical threshold or when there is unnecessary stock arise.

In today's systems, which requires analyzing the data come from increasingly complicated and from multiple systems, the easiest way to ensure this largeness of data to giving meaning fastly is supporting it with graphics.

As stated in an article of Wall Street Journal:

A new breed of "visual analytics" software aims to make it easier than ever to decipher all that information. The software takes data from multiple sources –including databases and spreadsheets- and creates a simple visual representations, such as charts, graphs, and maps. They're easier to grasp than pages of data, and they are much more flexible than regular charts and graphs. With just a few clicks, you can manipulate the pictures, checking out the effect of different variables or testing alternative scenarios[136]

5.5. Increase in usage of predictive analytics

We all see economists at television explaining the reasons after economic movements but rather than explaining the reason of a thing after it happens, it is worthful to foresee it before it happens. For example, firms which have this kind of predictions will guess what will the customer order and it gains a competition advantage which its rivals cannot copy easily, as for the example I mentioned in former section with Amazon's try to catch with its advance shipping service.

[136] Michael Totty, (2006),A New Look for Number Crunching, Wall Street Journal-The Journal Report: Technology, April 3

Even if the needed things for explaining the predictive analytics events and for explaining the events and making reports it is needed more sophisticated data analyzing methods more than analytic abilities, according to the Accenture survey[137] which is made with participation of 600 executives, the usage of forward data analyze has raised from 2009 to 2012 with a raise of three times more. The company attributes such growth in what its report calls this "advanced application of analytics" to increased "sophistication in analytics capabilities that anticipate tomorrow rather than explain yesterday."[138]

In the future, it can be said that there will be a raise and enlargement at the number of firms using predictive analytics and in the sectors using it. We can predict a price adjustment in predictive analytics available accommodation sector with balancing the prices dynamically abide by the repletion rate of rooms, the suggestion of the right promotion to the right customer in e-commerce, we can say that the usage rates will rise and the using sectors will vary.

5.6. Technological developments which permits the usage of unstructured data

Today the benefits which comes from the usage of shapeless data called ''unstructure data'' is discovered step by step by the firms. Interoffice e-mails, reports, documents, call center logs; video and pictures can be shown as example for this kind of data. Even if the organizations started to analyze this information source in detail with the rising processor power and cheaper storage area costs, for revealing the true power which this data have and for making sense of this data the persons who expertise in analytics and job process are needed.

For instance, today Honda tries to enhance its services by analyzing service reports with text mining techniques. This kind of analytic usage supports the firm in the subjects of differentiating service and production. But as you can guess for making sense of these texts the firm still has to receive support of a group of analysts. Again in the same way, the

[137] Accenture, (2013) , Analytics in Action:Breakthroughs and Barriers on the Journey to ROI A Perspective from Accenture Analytics with Findings from a Survey of Analytics Practitioners

[138] Natalie Burg, (2014),Your Company Can See The Future With Predictive Analytics, Forbes, 3.26.2014

engineering organization at General Motors has turned digitized videos of customer focus groups into powerful support tool to make design decisions. A team of twelve GM analysts conducted several focus groups a month, capturing thirty hours of video for each session – which obviously meant that thousands of hours of video accumulated quickly. By digitizing the content, technicians were able to spend half as much time searching for focus group findings from the raw video; in addition, product analysts could load the searchable content onto their laptops.[139]

When the grow apace information producing capacity of internet is added to this equation, it is not difficult to guess that kind of firms which use this kind of sophisticated methods will uptake and spread in the future.

5.7. Diffusion of social networks and its collateral changes

If we were able to see the future by looking into a crystal ball, probably we wouldn't feel any regret, we can see where our decisions takes us and we can make decisions which contributes us to reach our aim, render us big and successful.

Today, the business world searching ways of using social networks as a crystal ball that shows the future. The investments to this kind of sites are so big. But their studies about by using which ways of marketing models the investments comeback and which kind of predicts can be shown to the organizations in forward still continue.

For example, the social networks which over 2 billion of people use to transfer changes in their life everyday could help the firms to understand and determine the trends. For instance, what people expect and complain from the new product of the firm and what they think about the product which is released to the market. In the future, the firms who give voice to their customers about designing products, making a common value by producing the products will taste the success. Yochai Benkler (Yale Law) cites a Web site devoted to kite surfing, in which the aerospace engineers who populate the sport found design solutions embraced immediately by manufacturers. But he says even low-interest, mass-

[139] Larry Rosenberger and John Nash with Ann Graham, (2009),The Deciding Factor: The Power of Analytics to Make Every Decision a Winner, Jossey-Bass, San Francisco, USA, p.157

produced goods -- laundry detergent, for example -- will benefit from the amassed wisdom of the user base.[140]

Addition to this, the systems in which numerous people get interact with each other like social networks, are causing to the brand's outcome according to active user's comments in community. This situation is in the near future will raise the popularity of peer to peer product rating sites like 'epinions'. There will be a raise in the number of users who wants to make their last decision by reading the users comment about the product and make the products at stores read by their cell phones. In a survey conducted by Conversocial, more than 88% of consumers admitted to being influenced by comments posted by other consumers on social media sites[141]. The great interaction rate in social network sites will make the brands that use these networks to intervene when negative comments are over threshold. These intervenes can be made by collecting the faulty products or by finding a fast solution.

[140] Bob Garfield, (2005),Inside the New World of Listenomics: How the Open Source Revolution Impacts Your Brands, Advertising Age, October 11, 2005

[141] WEB_49, Digimind insights, (2014),How to predict the future using Social Media Monitoring , http://digimind.com/blog/social-media/predict-future-using-smm/, 6/5/2014

THE RESULTS

In the first part of the study, after having mentioned about history of analytic, by telling to the organizations why so many competitive edges in the past are expired today, the profits of being analytic is summarized clause by clause and by mentioning the situations if the analytic decisions are proper or not, the gaining of analytic competition to the organizations are elaborated. The point which shouldn't be missed in this section although I'm defending the advantages and profits of data analyze conclusion, this is an asset of the situations which can never possible to apply or which shouldn't be apply. For example, the moment when there is no time to analyze the detail in hand and reach a conclusion, the moment police agent decide shooting or not shooting the suspect or a situation for haven't been met before there is no sufficient amount of data on hand or the 9/11 events which can't be foreseen before with the data in hand that called black swan by the statisticians, either big economic crisis can be shown as example to those.

At the second part of the study, acquiring competitive advantage by applying the analytic methodologies systematically to decision make and studying systems, although they are from the different sectors who see analytic as a firm strategy, the sophisticated analytic methods they use and it is underlined that the firms known with their success at their own sectors share this four basic qualities. These qualities are; using the analytic for supporting a strategic and distinguishing feature, enterprise-wide analytics, senior management commitment and large scale ambitions. What means using the analytic for supporting a quality which is strategical and distinctive, is that using the firm's analytic for supporting a process separating the firm from its rivals. The Netflix's using analytic for offer the best film to its customer's tastes can be shown as example to this situation. What is important in this section is that because of the structure of some sectors, the truth of it is impossible to apply analytic to basic field which is want to be different. For example, in the industries in which there are variable like hard taste and style which are hard to gauge, based upon the human relations in the domain of executive search or like mode, its usage may not become real but however later on, the industries about whom we think it isn't possible to gauge numerically, based on intuitive and experience can get involved to the

competition. The best example for that is wine maker E. & J. Gallo and he used analytic approach in a mouth-pleasing sector for understanding his customer's tastes. The enterprise-wide approach mentions that for handle the information to support critic and competitive functions, you must set a network which consists all of the process. What is important in here is one of the reasons for not set up this network is quantitative like sales, like accounting. The early usage of analytic methods departments which deal with more quantitative jobs and using this kind of methods in advance and the spreadsheet's they used and the difficulties occur in the process of integration of inner-department databases to the system and the resistance of the executives of these departments not to share the methods and data in their hand mostly time. In that point the senior-management commitment becomes important because the organization's adoption of analytic competition requires changes in behavior pattern of employees, in studying style, in organization culture and this change must be supported and guided by senior management with forming a prize and punishment mechanism. In conclusion, large scale ambitions show up. These are the results to which the firm look forward to and the risk it will take for reach them. The firms who saw analytic as a way which goes to firm's future and not hesitated to take risks in this road became successful. ''What is seems us logic and maybe it should already be like that'' systems when they first used by game changer analytic firms the decisions were radical but the firms who believe to analytic became successful.

In the second part of the study after the common properties, an analytic competition level has been given. This part is important because it gives a scale to the firms who decided to be analytic competitive for measure their abilities in this way.

In the third part of the study, being a analytic competitive firm be liken to a puzzle and this puzzle's 5 basic elements mentioned as analytic delta are explained and by making it detailed, for every piece, which we mentioned in the second part in each step of competition, the abilities which an organization must have are mentioned. The first of these is data, the raw material which will be processed by data analytic. In here, especially called ''the unique data'' and only our management have or open to everyone but the data, using in different ways by our management creates a competitive advantage. In the enterprise

section, it is mentioned and that in diameter of the firm, usage of an analytic and how important it is involving all the systems. It can be concluded that this usage helps us to specify the processes which isn't reached to analytic maturity.

The third element is leadership and in this section which qualities the leaders share for steer the organization to be more analytic are mentioned. The chance of analytic attempts to be successful increases when the leaders support them. In this section, it can be concluded that the leaders who control money and human source and have impression on organization culture are the most important factor for specify how analytic an organization is.

The fourth element is target. In this section, it is discussed that all analytic opportunities can't gain favor equally and how to determine the differentiation points and how to use limited source and abilities in hand efficiently.

The analytic delta's last element is analyst. In this section, it is mentioned that the type of analyst and the abilities an analyst must have organizations needed for working properly. Where to gain needed work force, how to retain it, is discussed. As a result, it can be said that analysts are a different kind from the other employees and for being motivated and for whip their study desire they must be approached different from the other employees.

In the fourth section of the study, two different analytic applications are discussed and the gains of corporations in the eyes of readers are realized. The corporations are encouraged to choose analytic competition.

In the last section, predictions are made about the analytic competition's future and it is tried to show what kind of possibilities are expecting.

REFERENCES

- A. Fisher, Wanted: Data Scientists. No Math Chops? No Problem, Fortune, May 10, 2013
- Accenture Institute, (2008), Competing Through Business Analytics to Achieve High Performance, Accenture Information Management Services, December 2008.
- Accenture, (2013) , Analytics in Action: Breakthroughs and Barriers on the Journey to ROI A Perspective from Accenture Analytics with Findings from a Survey of Analytics Practitioners
- Alan Deutschman, (2004), Inside the Mind of Jeff Bezos, Fast Company
- Auer, S. R., Bizer, C.; Kobilarov, G., Lehmann, J., Cyganiak, R., Ives, Z., (2007), DBpedia: A Nucleus for a Web of Open Data. The Semantic Web. Lecture Notes in Computer Science 4825
- Avinash Kaushik, (2010),Web Analytics 2.0: The Art of Online Accountability & Science of Customer Centricity, Wiley Publishing, 2010,Indiana, USA
- Barry C. Smith, Dirk P. Gunther, B. Venkateshwara Rao, and Richard M. Ratliff, (2001), E-Commerce and Operations Research in Airline Planning, Marketing, and Distribution, Interfaces
- Bill Franks, (2012),Taming The Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics, John Wiley & Sons, New Jersey
- Bob Garfield, (2005),Inside the New World of Listenomics: How the Open Source Revolution Impacts Your Brands, Advertising Age, October 11, 2005
- Brian O'Reilly and Antony J. Michels, (1994),Reengineering the MBA, Fortune, January 24, 1994
- Cecilia Kang, (2011), Is Dish Network's new sidekick it's secret weapon?, Washington Post, 24/4/2011
- Chairman of the Council of Economic Advisors, The Economic Report of the President, 2007

- Chris Donnelly,(2009), Shopping for Scarce Retail Talent: Driving High Performance in the Retail Industry Through Strategic Talent Management , Accenture research report, 2009
- Chuck Salter, (2009), Why America is Addicted to Olive Garden, Fast Company, July, 2009
- Cross, R., (1997) , Revenue Management: Hard-Core Tactics for Market Domination., New York, NY: Broadway Books
- David A. Garvin, (2013), How Google Sold Its Engineers on Management, Harvard Business Review, December
- David A. Garvin, Alison Berkley Wagonfeld, Liz Kind, (2013), Google's Project Oxygen: Do Managers Matter; Harvard Business School, April 3
- David Darlington; The Chemistry of a 90+ Wine, Newyork Times Sunday Magazine, August 7, 2005
- David Fogarty and Peter C. Bell, (2013), Should You Outsource Analytics?, MITSloan Management Review, Winter 2014 ed.
- Elizabeth Craig, Robert J. Thomas and Chi T. Pham, (2008), Multiplying Talent for High Performance, Accenture Institute for High Performance research report, April 2008.
- Garry Klein, (1999), Sources of Power : How People Make Decisions ,MIT Press, 1999
- Halil Aksu, (2013), Big Data ve Diğer Yeni Trendler, Pusula Yayıncılık, Istanbul, Turkey
- J. Scott Armstrong, (1986), The Value of Formal Planning for Strategic Decisions: A Reply, Strategic Management Journal 7
- Jac Fitz-Enz ,(2010),The new HR analytics : predicting the economic value of your company's human capital investments, AMACOM, New York, USA
- James K. Harter, Frank L. Schmidt and Theodore L. Hayes,(2002), Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis, Journal of Applied Psychology, 2002

- James Lavin, (2005), Management Secrets of the New England Patriots, vol 2, Stamford, CT: Pointer Press, Connecticut, USA
- Jay Wright Forrester, (1961), Industrial Dynamics, Massachusetts Institute of Technology Press
- Jeanne G. Harris, Elizabeth Craig and Henry Egan, (2010), Counting on Analytical Talent, Accenture Institute for High Performance, March 2010
- Jeanne G. Harris, Elizabeth Craig and Henry Egan, (2010), How to Engage and Retain Analytical Talent, Accenture Institute for High Performance, January 2010
- John Battelle ,(2005), The 70 Percent Solution: Google CEO Eric Schmidt gives us his golden rules for managing innovation, CNN Money magazine, December 1, 2005
- John W. Boudreau and Peter M. Ramstad, (2005), Where's Your Pivotal Talent? , Harvard Business Review
- Kathleen M. Immordino, (2009), Organizational Assessment and Improvement in the Public Sector, ASPA, CRC Press, London, UK
- Larry Rosenberger and John Nash with Ann Graham, (2009),The Deciding Factor: The Power of Analytics to Make Every Decision a Winner, Jossey-Bass, San Francisco, USA
- Lev Manovich, (2013), Software Takes Command, Bloomsbury Publishing, New York, USA
- Main Van Crevekl, (1985), Command in War II, Vad University Press
- Malcolm Gladwell, (2007), Blink: The Power of Thinking Without Thinking, Little Brown, New York, America
- Matthew Stevenson, Sean Junor, What Will Next Generation Workforce Planing Look Like? The Cameco Story, Mercer Webcast, Jan 28,2014
- Michael Minelli, Michele Chambers, Ambiga Dhiraj, (2013),Big Data Big Analytics: Emerging Business İntelligence and Analytical Trends for Today's Businesses, Wiley
- Michael Totty, (2006),A New Look for Number Crunching, Wall Street Journal-The Journal Report: Technology, April 3

- Natalie Burg, (2014),Your Company Can See The Future With Predictive Analytics, Forbes, 3.26.2014
- Peter G. W. Keen, Michael S. Scott Morton, (1978), Decision Support Systems: An organizational Perspective, Addison-Wesley
- R. Grover, Box Office Brawn, (2008) ,BusinessWeek, January 14,2008
- Rajiv Lal and Patricia Matrone Carrolo, (2002), Harrah's Entertainment,Inc. Case 9-502-011,Harvard Business School, Boston, USA
- Rashik Parmar, Ian Mackenzie, David Cohn ve David Gann, (2014), İnovasyonun yeni modelleri, Harvard Business Review Türkiye, Ocak-Şubat
- Scott Bowles, (2008) , Will Smith Has Found the magic Formula, USA Today, June 26,2008
- Stalk, G., P. Evans & L. E. Shulman, (1992), Competing on Capabilities: the New Rules of Corporate Strategy. Harvard Business Review. 70 (March/April), Boston, USA
- Stephen Gandel, (2010), How Blockbuster Failed at Failing, Time, 10/11/2010
- Steve LaValle, Eric Lesser, Rebecca Shockley, Michael S. Hopkins and Nina Kruschwitz,(2011), Big Data, Analytics and the Path From Insights to Value, December-February 2011, Vol.52 No.2
- Tammy Erickson, (2012) ,The Biggest Mistake You (Probably) Make with Teams, Harvard Business Review, April 5 2012
- Thomas H. Davenport, Don Cohen, and Al Jacobson, Competing on Analytics, Babson Executive Education
- Thomas H. Davenport, International Institute for Analytics, (2012), Enterprise Analytics: Optimize Performance, Process, and Decisions through Big Data, FT Press, New Jersey, USA, 2012
- Thomas H. Davenport, Jeanne G. Harris, (2007), Competing on Analytics, Harvard Business Press, Boston, USA
- Thomas H. Davenport, Jeanne G. Harris, Robert Morison, (2010), Analytics at Work: Smarter Decisions, Better Results, Harvard Business School Press, Boston, USA

- Thomas H. Davenport, Jeanne Harris and Jeremy Shapiro, Competing on Talent Analytics, October 2010, Harvard Business Review
- Thomas Redman, (2001), Data Quality: The Field Guide, Digital Press, Boston, USA
- Timothy Bevins and Naumi Haque, (2010) ,Data Enabled Collaborative Decision-Making: A Guide for Next Generation Enterprise Decision Processes
- TUİK, (2013), Hanehalkı İşgücü İstatistikleri, Haziran 2013, Sayı:13590, Sept 16 2013
- Turkish Statistical Institute, Population Projections 2013-2075 , 14 February 2013

E-REFERENCES

- WEB_1, (2003), Power D.J. ,A Brief History of Decision Support Systems http://dssresources.com/history/dsshistoryv28.html, 1/1/2014
- WEB_2, (2005), Chris Anderson, The Zen of Jeff Bezos, http://www.wired.com/wired/archive/13.01/bezos.html , 1/5/2014
- WEB_3,Wikipedia contributors, Black Swan Theory, http://en.wikipedia.org/wiki/Black_swan_theory, 1/5/2014
- WEB_4, (2013), Tom Vanderbilt, The Science Behind the Netflix Algorithms That Decide What You'll Watch Next, http://www.wired.com/2013/08/qq_netflix-algorithm , 1/6/2014
- WEB_5,(2013),Colloquy magazine, The Winner: Caesars Entertainment, http://www.colloquy.com/article_view.asp?xd=10745 , 1/6/2014
- WEB_6, (2013), Renee Boucher Ferguson, How Analytics is Giving Fashion a Makeover, http://sloanreview.mit.edu/article/how-analytics-is-giving-fashion-a-makeover , 6/29/2014
- WEB_7, Vantage Score, http://www.vantagescore.com/, 3/12/2014
- WEB_8, Christopher Cruise, How credit scores affect insurance rates, http://www.bankrate.com/brm/news/insurance/credit-scores1.asp, 1/10/2014
- WEB_9, Freescore.com, Who want to know your credit score?, http://www.freescore.com/your-credit-score.aspx, 1/10/2014
- WEB_10, Wikipedia contributors, Business Intelligence Competency Center, http://en.wikipedia.org/wiki/Business_Intelligence_Competency_Center, 1/25/2014
- WEB_11, Bill Halal, How Netflix Beat Blockbuster: An Exemplar of Emerging Technologies, ,25/1/2014
- WEB_12, Erika Check Hayden, (2012), Open-data project aims to ease the way for genomic research, Nature.com, http://www.nature.com/news/open-data-project-aims-to-ease-the-way-for-genomic-research-1.10507 ,2/5/2014

- WEB_13, Ted O'Brien, (2013), Big Data and Predictive Analytics: When is Enough Data Enough?, http://blog.starbridgepartners.com/2013/10/10/big-data-and-predictive-analytics-when-is-enough-data-enough/#.U7AEWfmSwmx ,2/5/2014
- WEB_14, Peter Klugsberger, (2005), What made Harrahs an Innovation Leader?, http://www.urbino.net/downloadFiles/SI050620_PKlugsberger_Harrahs.pdf, 2/10/2014
- WEB_15, Verint.com, Speech Analytics: Use the voice of your customer to optimize your business, http://www.verint.com/solutions/enterprise-workforce-optimization/products/speech-analytics/index, 6/20/2014
- WEB_16, Bill Michells, (2013), Smaato Using Geopulse Audience to Improve Mobile Ad Targeting, http://blog.factual.com/smaato-using-geopulse-audience-to-improve-mobile-ad-targeting, 5/1/2014
- WEB_17, Sandra O'Loughlin, Inside Best Buy's Analytics-Based Customer-Centric Marketing Blueprint, Event Marketer, http://www.eventmarketer.com/article/inside-best-buys-analytics-based-customer-centric-marketing-blueprint#.UrkxHvRdXjk, 4/7/2014
- WEB_18, Dennis Hartman, Wages to Sales Ratio, Chron.com, http://smallbusiness.chron.com/wages-sales-ratio-12713.html, 3/5/2014
- WEB_19, Liaison Case Study, Liaison Technologies Cures Supply Chain Data Headache for Orion, http://liaison.com/docs/case-studies/liaison---orion-eu-integration-and-supplierweb-case-study.pdf?sfvrsn=10, 5/7/2014
- WEB_20, Liaison Case Study, O'Neill Europe Consolidates its Diverse Range of Applications and Databases onto a Single, Easy-to-Use Platform in Just Two Months., http://liaison.com/docs/case-studies/liaison---oneill-eu-delta-ecs-case-study.pdf?sfvrsn=8, 5/7/2014
- WEB_21, SearchDataManagement, (2010), What is Master Data, TechTarget, http://searchdatamanagement.techtarget.com/definition/master-data-management, 5/7/2014

- WEB_22, Trillium Software, (2010), Case study Iceland Frozen Foods, http://www.trilliumsoftware.com/uploadedFiles/Iceland_Frozen_CS_10_2010.pdf, 5/7/2014
- WEB_23, SymphonyIRI, (2011), IRI Delivers Next-Generation Shopper Insights for World's Largest Retailer,Press Release, http://www.iriworldwide.com/NewsEvents/PressReleases/tabid/97/ItemID/1314/View/Details/Default.aspx, 5/7/2014
- Web_24, Mark Whitehorn, (2006), The parable of the beer and diapers: Never let the facts get in the way of a good story, http://www.theregister.co.uk/2006/08/15/beer_diapers/, 5/7/2014
- WEB_25, addict, (2007), Funny Federal Express commercial, http://www.youtube.com/watch?v=zNCrMEOqHpc, 5/7/2014
- WEB_26, Ben Dattner, (2012), Give Credit Where It's Due, HBR Blog Network, http://blogs.hbr.org/2012/03/give-credit-where-its-due/, 5/10/2014
- WEB_27, Susan M. Heathfield, What's the Big Deal About Clear Performance Expectations?Clear Performance Expectations Enable Success, http://humanresources.about.com/od/teamworksuccess/qt/clear_expectations.htm, 5/10/2014
- WEB_28,International Business Times, (2014), http://www.ibtimes.com/exnet/four-reasons-why-you-need-patience-right-now-797121, 5/10/2014
- WEB_29, Walmart, http://stock.walmart.com/faqs/, 5/11/2014
- WEB_30, Noah Smith, (2013), The 10 Stealth Economic Trends That Rule the World Today, http://www.theatlantic.com/business/archive/2013/09/the-10-stealth-economic-trends-that-rule-the-world-today/280107, 5/12/2014
- WEB_31,Betterevaluation.org, http://betterevaluation.org/theme/organizational_performance, 5/13/2014
- WEB_32, Ashu Bhatia, (2005), Data Rich, Information Poor? Focus On Right Metrics, http://www.tdan.com/view-articles/5115, 5/14/2014
- WEB_33, JD Edwards Portal, http://www.go9withjde.com/en/jd-edwards-by-industry/asset-intensive, 5/14/2014

- WEB_34,Investopia,http://www.investopedia.com/terms/l/laborintensive.asp, 5/14/2014
- WEB_35, Visual analytics portal, What is visual analytics?, http://www.visual-analytics.eu/faq/, 5/15/2014
- WEB_36, Natasha Lomas, (2014), Amazon Patents "Anticipatory" Shipping — To Start Sending Stuff Before You've Bought It, http://techcrunch.com/2014/01/18/amazon-pre-ships/, 5/15/2014
- WEB_37, TIBCO Spotfire's Business Intelligence Blog (2010), Acting on Data Analytics – More than Food for Thought, http://spotfire.tibco.com/blog/?p=4236, 5/15/2014
- WEB_38, Dr. John Sullivan (2013), How Google Is Using People Analytics to Completely Reinvent HR, http://www.tlnt.com/2013/02/26/how-google-is-using-people-analytics-to-completely-reinvent-hr/, 5/16/2014
- WEB_39, Mark C. Crowley, (2013), Not a Happy Accident: How Google Deliberately Designs Workplace Satisfaction , Fast Company, 5/17/2014
- Web_40,Cameco:World's leader uranium manufacturer, http://www.cameco.com/about/, 5/18/2014
- WEB_41, Laura Squier , (2013), 8 professionals you need to build your analytics dream team, http://www.sas.com/knowledge-exchange/business-analytics/building-an-analytical-culture/8-professionals-you-need-to-build-your-analytics-dream-team-cont/index.html, 5/19/2014
- WEB_42, Institute for advanced analytics, NC State University, http://analytics.ncsu.edu/, 5/20/2014
- WEB_43, Anna Brown, (2012) ,How does a center of excellence really work?, sas.com, October 23, 2012 , http://www.sas.com/knowledge-exchange/business-analytics/building-an-analytical-culture/how-does-a-center-of-excellence-really-work/index.html, 5/22/2014
- WEB_44, KPMG, (2013), People are the real numbers: HR analytics has come of age,

http://www.kpmg.com/AU/en/IssuesAndInsights/ArticlesPublications/Documents/people-workforce-hr-analytics.pdf, 5/23/2014

- WEB_45, Kriss Dunn, (2008),Why HR Should Love the New England Patriots, http://www.workforce.com/articles/why-hr-should-love-the-new-england-patriots, 5/24/2014
- WEB_46, Josh Bersin, (2013) ,Big Data in Human Sources:Talent Analytics Comes of Age, Forbes ,17.2.2013, http://www.forbes.com/sites/joshbersin/2013/02/17/bigdata-in-human-Sources-talent-analytics-comes-of-age/, 5/25/2014
- Web_47, United Health Group, http://www.unitedhealthgroup.com/About/Default.aspx, 5/25/2014
- WEB_48, Farhad Manjoo, How Google Became Such a Great Place to Work, Slate.com, January 21, 2013, http://www.slate.com/articles/technology/technology/2013/01/google_people_operations_the_secrets_of_the_world_s_most_scientific_human.html, 5/26/2014
- WEB_49, Digimind insights, (2014),How to predict the future using Social Media Monitoring,http://digimind.com/blog/social-media/predict-future-using-smm/, 6/5/2014

RESUME

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