Business Analytics: Review of Frameworks for Business Analysis Project.

AKASH NAUHWAR[1], ADITYA TELANKAR[2]
[1, 2] *AIMS Institute for Management Studies*

Abstract- Business analysis is a research discipline of identifying business needs and determining solutions to business problems. Solutions often include a software-systems development component, but may also consist of process improvement, organizational change or strategic planning and policy development.

I. INTRODUCTION

In general terminology, a business analysis framework is nothing but a conceptual structure which talks more about the utilization of knowledge, process techniques, a critical analysis which helps in getting on the required business requirements. Using this framework, the individual will be able to understand the pain points of the business and emphasize more on business enhancement opportunities.

The business analysis process might be different from one organization to the other. The approach might be different as well. For example, especially in Information technology vertical, the solutions that business analysts provide are related to software development and involve in constant process improvement or organizational level change.

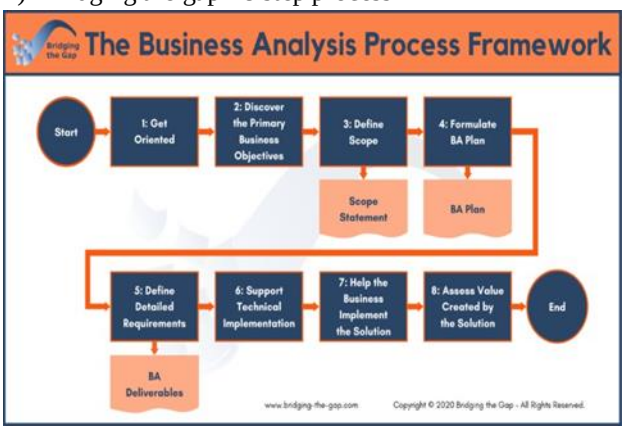
How to understand BA framework?
The entire business analysis framework can be classified into five sections. Within these sections, a business analyst or a business analyst team will be able to identify, analyze, and document the requirements. A lot of subtasks are carried out within these sections, which will in return help the business analyst to document the exact requirements from the business owners and the stakeholders.

- Investigate the situation
- Consider Perspectives
- Analyze Needs
- Evaluate options
- Define Requirements

Different types of framework is used in different projects some of them are below:

1) Bridging the gap - 8 step process
2) Mckinsey: The 7-S Framework
3) A unified foundation for business analytics
4) FMCG Analytics Framework
5) A Framework for Better Civic Analytics
6) A Framework for the Design and Specification of Data Analytics Projects

1) Bridging the gap - 8 step process



i) Getting Oriented
Here a business analyst identifies the role of team members they will be playing in the project. Identify all the stakeholders of the project. Get understanding of the history of the product project. Identify the processor involved in the project.

ii) Discover the primary Business Objective This is where business analyst has to invest time into discovering the whys of the project. Use various tools like doing internal product assessment. Develop a problem statement to get a clear and precise understanding of. Communicating the objective effectively across team and stakeholders

develops a collective understanding of problem that is to be solved.

iii) Define scope

According to Scope of project can be defined as "The scope of the product identifies the boundaries of the solution. The decision on the product scope is concerned with determining which of the business requirements (bearing in mind the constraints) could be carried out the by solution". Defining scope give us a clear understanding of what to be delivered into the product and prevent us from adding additional features into the product that complicates the product.

iv) Formulating your BA plan

A BA plan Is a set of objectives that you want to achieve in the project. It also includes how you are going to assess the success of the project considering the scope and the context of project. Defining the list of the deliverables and the times required for delivering them is also decided in this step.

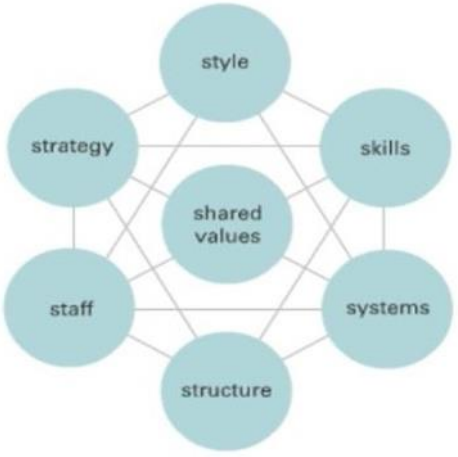
v) Defining the detailed requirements This is the step where we go into the specifics of the requirement while developing a product. Here would develop lean product that can be deployed. This lean product is called MVP (minimum viable product). After deployment of the product getting the feedback and adding new features one by one. We also engage put the stakeholders to clarify additional this requirement

vi) Support for technical implementation for the deployment of the product successfully A business analyst must now perform the role of support for the implementation. reviewing the delivered product to ensure that they fulfil the requirement hey and updating the requirements. Here analyst must ensure that project is running on time.

vii) Help business implement solution Here business analyst check whether the intended requirements are achieved if not, develop oh way to help business achieve the outcome (for example conducting trainings for the employees).

viii) Assess the value created by the solution This step includes writing a performance report and assessing the value created by the implementation of the solution this is done with the decided parameters in BA plan.

2) Mckinsey: The 7-S Framework



The McKinsey 7S Framework is a management model developed by business consultants Robert H. Waterman, Jr. and Tom Peters (who also developed the

MBWA-- "Management By Walking Around" motif, and authored In Search of Excellence) in the 1980s. This was a strategic vision for groups, to include businesses, business units, and teams. The 7 Ss are structure, strategy, systems, skills, style, staff and shared values.

The model is most often used as an organizational analysis tool to assess and monitor changes in the internal situation of an organization.

i) Style

Style includes formal and informal structure culture that a company exhibits as a whole from top to bottom. According to [2] "Style represents the way the company is managed by top-level managers, how they interact, what actions do they take and their symbolic value. In other words, it is the management style of company's leaders".

ii) Skills

Skills include the individual and institutional skills

that are required in organisation to Succeed in rapidly changing world. "Skills are the abilities that firm's employees perform very well. They also include capabilities and competences. During organizational change, the question often arises of what skills the company will really need to reinforce its new strategy or new structure"

iii) Systems

Systems are basically the processes that are carried out in an organization. For example, HR process, Risk management system.

"Systems are the processes and procedures of the company, which reveal business' daily activities and how decisions are made. Systems are the area of the firm that determines how business is done and it should be the main focus for managers
during organizational change."

iv) Structure

Structure is the physical hierarchy of authority within organisation. "Structure represents the way business divisions and units are organized and includes the information of who is accountable to whom. In other words, structure is the organizational chart of the firm. It is also one of the most visible and easy to change elements of the framework."

v) Staff

Staff refers to the people in the organisation and what talents do they have. "Staff element is concerned with what type and how many employees an organization will need and how they will be recruited, trained, motivated and rewarded."

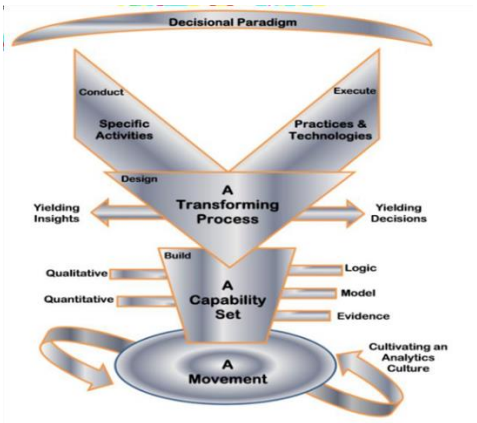
vi) Strategy

Strategy is the plan for how company want to achieve the targets. "Strategy is a plan developed by a firm to achieve sustained competitive advantage and successfully compete in the market. What does a well-aligned strategy mean in 7s McKinsey model? In general, a sound strategy is the one that is clearly articulated, is long-term, helps to achieve competitive advantage and is reinforced by strong vision, mission and values. But it is hard to tell if such strategy is well-aligned with other elements when"

vii) Shared Values

Shared values are the values imbued in the organisation culture. These are the ethics that the organisation follows. "Shared Values are at the core of McKinsey 7s model. They are the norms and standards that guide employee behaviour and company actions and thus, are the foundation of every organization"

2) A unified foundation for business analytics



Business analysis is a supporting role for decision making. This support is often given by finding the evidence for making a decision. This evidence finding approach is seen with different perspective in This paper by Clyde Holsapplea, Anita Lee-Post b, Ram Pakathc. They have combined these different perspectives in a single framework for Business Analysis.

i) A Movement

Analytical movement is a philosophy of culture of evidence-based decision making rather than depending on intuition, domain knowledge, expertise for making a decision. Following this philosophy, the decision- making process if free from internal politics and personal agendas.

ii) A collection of practices and technologies

From this perspective Business analysis Is seen as number churning job. This mentality mainly comes from technology driven environment. The technology includes all the software tool that are used in analysis procedure. Practices refers to the way or approach that is used to find evidence.

iii) A transformational process

This is a process of transforming evidence into

insights and actions. This is done with the process that are mentioned above with the help of technology.

iv) A capability set
Role of business analyst is seen as a person competent in various analytical competencies. Using models and techniques are seen as a role an analyst is supposed to play in an organisation.

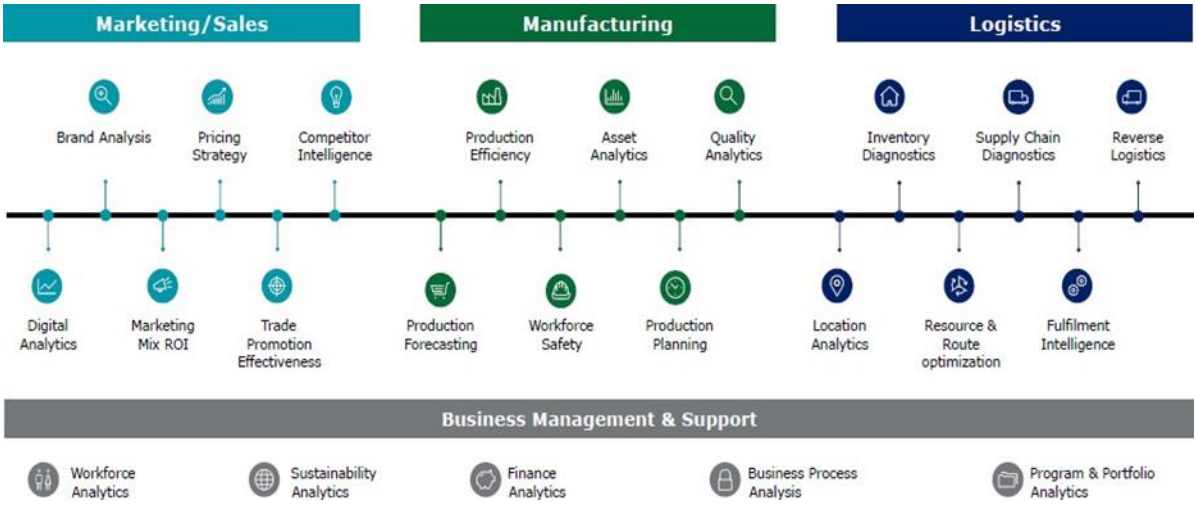
v) An activity type set
From this perspective the business analysis process includes the activities like accessing, examining, aggregating and analysing evidence are the key role of business analyst.

vi) A decisional paradigm
According to this perspective business analysis is a combination of all the above- mentioned perspective. A role of business encompasses all the role specified above

3) FMCG Analytics Framework

Analytic capabilities for better decisions across the FMCG value chain.

i) Marketing/Sales:
In the Marketing/Sales process of the FMCG value chain, analyses are geared towards improving commercial performance and customer centricity



processes to increase sales while keeping the marketing costs at the same level.

Digital Analytics

The online channels are of increasing importance, also in FMCG. Defining a uniform digital KPI framework and building web analytics capabilities is key to create insights into the digital performance on the ecommerce platforms.

Pricing Strategy
The analysis focuses on demand variation at different price levels with different promotion/rebate offers. It is used to determine optimal prices throughout the product/service lifecycle by customer segment. Benefits include increasing sales margin, decreasing markdowns and aiding inventory management.

Brand Analysis
This analysis focuses on providing insights into the brand perception of a firm. With the use of (among others) sentiment analysis the firm can compare the perception of their brand with that of the main competitors and create a data driven brand strategy.

Trade Promotion Effectiveness
This analysis focuses on providing insight in both the effectiveness and planning of trade promotions. These insights allow the company to improve the aforementioned

Marketing Mix ROI
Analyses focus on determining the effectiveness of marketing investments. By reducing ineffective spend

and intensifying high return marketing tactics, the marketing mix is optimized leading to higher returns on the overall marketing spend.

Competitor Intelligence
Knowledge is power. Knowledge of what your competitors are doing allows you to take action quickly in order to gain an advantage. This analysis focuses on obtaining this knowledge and extracting the actionable insights that allow one to form data-driven competitor strategy.

ii) Manufacturing
In the Manufacturing process of the FMC Gvalue chain, analyses are focused on optimizing production processes taking in consideration forecasting, planning, efficiency and risk exposure

Production Forecasting Optimization
Analyses focus on the evaluation of promotion forecasting based on a measurement framework of forecasting accuracy/error, bias and stability. Improving forecasting accuracy can potentially lead to reductions in excess inventory, lower labour costs, lower expedite costs, holding costs, spoilage discounts and reduced stock-outs.

Asset Analytics
Analyses focus on the prediction of the lifetime of long term assets such as building, large machinery and other structural elements. This is done by calculating the influence of for instance weather, material and usage of the assets.

Production Efficiency
Analyses focus on proactively addressing challenges such as the increase of efficiency and reduction of costs, but also to help identify opportunities for consolidating facilities and determine outsourcing and offshore transfer solutions for international and domestic organizations.

Production Planning
Analyses focus on the support of delivering more scientific and data based real time contingency plans by generating optimal solutions in short time windows after certain disruptions happen.

Workforce Safety
Analyses focus on the identification of the key factors impacting safety related incidents, the design of measurable interventions to minimize safety risk and the prediction of types of person(s) who are most at risk to get hurt.

Quality Analytics
Analyses focus on identifying the high impact issues and understanding a facility's past performance. The solution consolidates information allowing a better understanding of the organization's scope drilling down to a single facility to make actionable decisions.

iii) Logistics
In the Logistics process of the FMCG value chain, analyses are focused on optimizing delivery, shipments and warehousing performances

Location Analytics
This type of analysis helps solve the problem on what the optimal location is for a certain facility, based on geographical data. As an example, the fire department would want their facilities to be spread throughout a city, so that a fire at any point in the city can be reached with an acceptable response time.

Supply Chain Diagnostics
Supply chain diagnostics aims at enabling and improving the ability to view every item (Shipment, Order, SKU, etc.) at any point and at all times in the supply chain.

Furthermore its goal is to alert on process exceptions, to provide analytics, and to analyse detailed supply chain data to determine opportunities of cycle time reduction.

Inventory Diagnostics
What is the optimal inventory level that on the one hand makes sure that the customer receives their goods on time, and on the other hand ensure that the holding and ordering costs are as low as possible? The goal of the analysis is to solve this problem for the client.

Fulfilment Intelligence
Focuses on increased reliability of purchase order submission process until delivery.

Analysing supply chain for identification of common or consistent disruptions in fulfilment of orders. Reliability is key, even more so than speed.

Resource & Route Optimization
The goal of the model is to optimize the available resources and truck routes. This is executed to maximize profitability by implementing the new optimized route planning model which leads to a reduction of the resource usage.

Reverse Logistics
In case of malfunctioning products, companies have to deal with the process of reverse logistics. By getting more detailed insights in the costs of this process, companies can have a better focus on how to reduce these costs.

iv) Business Management & Support
In the Support process of the FMCG value chain analyses are focused on determining potential improvements in the organization

Workforce Analytics
Encompasses workforce planning and analytics across all phases of the talent lifecycle. The workforce planning component provides insights and foresight into addressing current and future talent segment related challenges and development. Moreover, this offering applies analytics solutions to key talent processes.

Business Process Analytics
Help clients to understand their risk exposure better, and to proactively identify and mitigate sources of risk on an enterprise scale. Armed with this information, executive management and boards will be better equipped to navigate challenging economic conditions.

Sustainability Analytics
Helps clients with sustainability related strategies such as assessing future environmental and health impacts. Using an overview of the most important resources and an insights in the product lifecycle, a prioritization can be made which product categories are most at risk and which show the most potential.

Program/portfolio analytics
Enables clients to model their program/portfolio performance y providing fact based insight into the performance of the total portfolio down to project level.

Among other things, It allows clients to prioritize projects better, identify potential budget overruns in an early stage and optimize resource allocation.

Finance Analytics
- Working capital, spend analytics, double payment, risk and tax analyses
- Helping clients to get control of their financial data, finance analytics enable clients to model business processes and gain deeper insight into cost and profitability drivers.

4) A Framework for Better Civic Analytics
Strategic framework for a Chief Data Officer (CDO):
The scope of responsibilities for a CDO varies and can include any combination of the following: open data, data collection and data sharing standards, data management, performance management, geographic information system (GIS) and data visualization, and data analytics.

Regardless of the scope, the CDO is a leader for data-driven government and some aspects of the job are common across all CDOs.

Many government CDOs, particularly newer ones, are in their early stages and have not yet formalized their strategies and operating models. The graphic below presents a framework for thinking about the components of a CDO role, from developing a strategy, to building a team and engaging with departments, to conducting analytics and fostering a citywide data culture.

Each element of the strategic framework is described in the pages that follow.

i) Strategy
The strategy phase includes setting a clear charter, developing a mission statement, and creating a roadmap for implementation, as described below.

a) Clear Charter

Strategy begins with the charge from the chief executive, which should answer key questions, such as:

- what role has the CDO been asked to play in government?
- How does the CDO relate to other parts of government and how are responsibilities divided?
- What resources have been provided to support the charter?
- Is the charter made clear across government in an executive order or other public document?
- How is the CDO being announced and introduced to peers within government?

b) Mission

With a clear charter from the chief executive, a CDO can define a mission, a concise statement of the difference the CDO can make in government over a three- to five-year time horizon. A mission statement is valuable in making clear to departments the types of support a CDO can provide, and just as importantly, the tasks that are out of scope.

a) Implementation Roadmap

Building a roadmap lays out the steps and actions and the timeframe required to achieve them. A roadmap can take the form of a strategic plan or an implementation plan. A roadmap should identify the resources necessary to execute, including the skills needed and the process for identifying them. It should indicate the timeframe for each activity as well as who is responsible (staff, vendor, pro bono partner, etc.). It is helpful to update or revisit the roadmap on an annual basis.

ii) Building a team

A CDO is typically the first hire. Depending on the charge and the available resources, the CDO may be a one-person shop briefly or for an extended period. For CDOs who have the resources to build a team, the following pages address the issues to consider in creating the team.

a) Defining Roles

The size of a CDO team can be one, or a handful, or up to 30 in the largest operations. The roles and skills to be acquired in building the team will depend on the mandate and the scope for the CDO. Due to the wide variety of tasks asked of a CDO organization, generalists with strong analytical capabilities are often critical staff members. This is especially pronounced within the smallest organizations.

b) Finding, Training, and Retaining Talent

The challenge of finding and hiring the right staff is significant, with many CDOs reporting that they have problems both finding the right staff and keeping them. Because data analytics in government is a new field, there isn't an established career path or a universal training ground. There are a handful of graduate programs to train students specifically for jobs in data science or analytics in the public sector.

c) Leveraging Partnerships to Create More Capacity

Many successful city CDOs extend their capacity with partnerships. For example, Pittsburgh CDO Laura Meixell has extended her team's capacity by partnering with nearby Allegheny County and the University of Pittsburgh. This collaboration resulted in a regional data center, which hosts a combined open data portal and links their open data to that of other public sector agencies, academic institutions, and nonprofit organizations.

Many CDOs partner with local educational institutions for fellows, PhD projects, and interns. Boston runs a successful summer fellow program that includes both graduate students and college interns who have worked on substantive projects, including a homelessness data warehouse. Taking on summer interns and fellows does take an investment of time, but it can have long- term value when the work product is good, and if used as a process to recruit and screen future full-time employees.

iii) Data stewardship and analytics

The day-to-day work of moving a government toward greater ability to use data consists of data stewardship and data analytics. No two CDOs are alike, and not all have responsibility for both stewardship and analytics, but the two functions are interdependent and are addressed together here.

Data stewardship refers to the data infrastructure to manage data, and the data governance that guides data collection and quality, such as in an open data program.

Data stewardship is perhaps the least discussed and yet one of the key inputs to a CDO's success, as it enables the analytics projects that build excitement and bring press attention.

The term analytics is used widely and with many definitions. According to the Business Dictionary, analytics "involves studying past historical data to research potential trends, to analyze the effects of certain decisions or events, or to evaluate the performance of a given tool or scenario." For purposes of this paper, analytics refers to the work of turning data into insight, whether through descriptive reports and mapping, or via predictive modeling.

CDO responsibilities vary widely, with some focused mostly on data stewardship and their open data programs, and others more focused on analytics. While not all CDOs have jurisdiction over data governance, all CDOs have an interest in data quality and availability.

iv) Messaging to and engaging departments
Once a vision and roadmap and a team are in place, the CDO can begin engaging with departments. At this point, a written summary of the CDO's charter is helpful as it will help make clear to departments what the team will and will not do. A one-page summary of the types of projects a CDO office will take on or an FAQ document might be helpful.

a) Engaging with Departments Across Government
A CDO can interact with other parts of government in a variety of ways. How a CDO chooses to engage with departments will depend on a variety of factors including how ready the departments are to make use of their data and how open the department heads are to the involvement of an outsider in their work. The type of engagement will vary from developing data dashboards to creating sophisticated predictive analytics models. The level of engagement will vary by department, but the overall philosophy of engagement can be established by the CDO.

In the private sector, where CDOs have been in place for longer than in the public sector, experts have studied the engagement of CDOs and have described two basic models—centralized and decentralized.

b) Identifying Analytics Projects from Departments
For a CDO, coming up with a structured way of engaging departments in analytics projects can be challenging. Many government CDOs are new to their jobs and have not yet developed their strategy for engaging with and soliciting project ideas from departments. Interesting models for gathering input from departments for possible analytics projects are found in Chicago, New Orleans, and New York City.
The City of Chicago received a grant to create an open-source predictive analytics platform, the Smart Data Platform, as a winner of the Bloomberg Philanthropies Mayors Challenge. To generate predictive analytics ideas, or use cases, for the Smart Data platform, Chicago developed a methodology to systematically reach out to agencies across the city to gather input and to identify the most powerful ways to use predictive analytics to improve city services to the public.

v) Fostering a culture of data-driven government
The impact of a CDO can be significant and lasting—they have the power to foster a culture of data use across government and create distributed capacity. In moving their government toward data-driven decision-making, the CDO faces the classic tradeoff between doing the work for departments or "teaching them to fish." In many cases, the CDO has no choice but to build distributed capacity.

One of the best examples of creating culture change and building capacity across government comes from San Francisco, where the CDO's office in partnership with the Controller's office offers training to city and county staff on a variety of data skills through the SF Data Academy. Their goal is to allow city staff to "explore, refine, and enhance their skills in data analysis and visualization." A variety of courses are offered on a regular basis, and customized courses can also be delivered to a department. Courses include both classroom-based learning and online courses, designed to be accessible to a broad audience. Topics include skills such as business process mapping and specific tools such as Excel and Tableau.

5) A Framework for the Design and Specification of Data Analytics Projects.

Analytics Canvas The Analytics Canvas is a semi-formal specification technique for describing an

analytics use case, the necessary infrastructure as well as requirements for each domain. It uses a clear and extendable graphical notation to support communication between the various stakeholders of different domains in an analytics project.

The Analytics Canvas is based on a four- layer model to describe an Analytics Use Case, as shown in figure 4. It is an extension of the work of Reinhart et al.

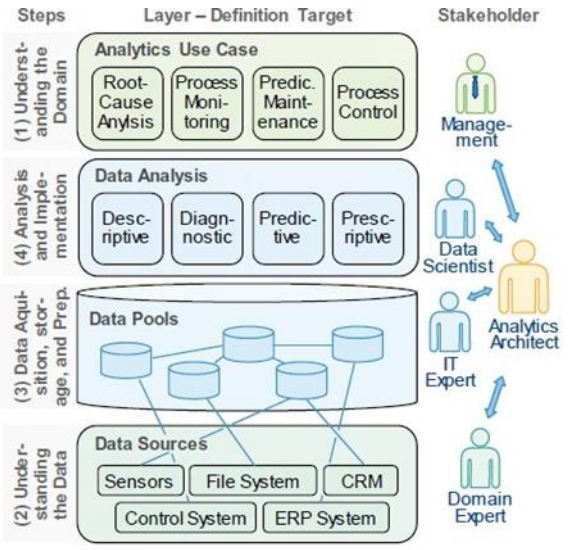


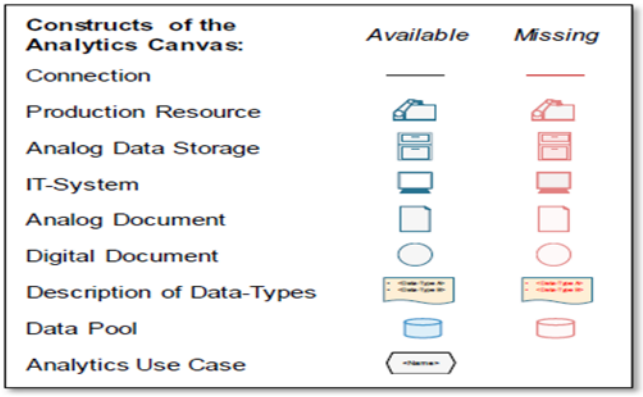
Fig. 4. Layer Model for describing Analytics Cases and its Requirements

The layer model differentiates between "analytic use case", "data analysis", "data pools" and "data sources". The first step is to understand the problem and analyze the domain. This is similar to the process model CRISP-DM. The objective and output of this problem analysis are the analytics use cases. Generally, the higher management is highly interested in this step. The second step is to analyze and define the data. The data sources have to be clarified. This means defining which sensors or file systems provide the data in which form.

Experts from the specific domains have to be involved here. After knowing from where the data comes, it is necessary to know where the data is stored. This is essential for the data preprocessing and fusion. The last step is to analyze the data. It has to be defined what shall be done with the data. One example is that the data shall be used to say what happened with a machine. Another example is that the application shall be able to solve a problem itself and take actions autonomously. The definition of the use case describes the targeted functionality. The main task of data scientists is to ensure the targeted functionality.

Constructs of the Analytics Canvas

The Analytics Canvas extends the layer model shown in figure 4 by differentiating between data pools and data description within the data acquisition layer. We thus arrive at five layers: analytics use case, data analysis, data pools, data description and data source. Within each layer, the necessary elements for an analytics project are described. Furthermore, the Analytics Canvas provides nine different constructs. The constructs are used within the different layers of the framework.

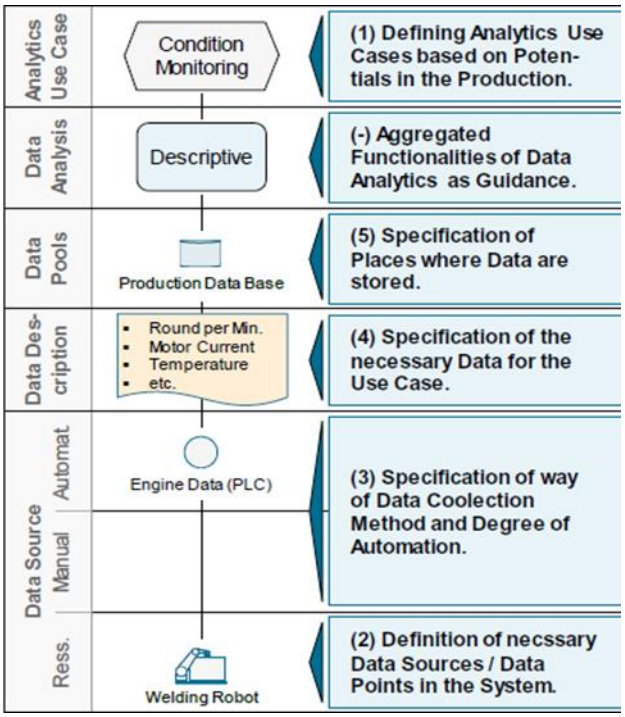


Data sources are presented using "production resources", "analog data storage" or "IT-systems". Concerning the data type, it is further specified whether it is an "analog document" or "digital document". Which data is needed, for example from a specific machine, is specified in the construct "description of data types". Where the data is eventually stored, is defined by the „data pool".

Finally, the application is described using the construct „analytics use case". When describing available elements, the constructs are displayed in a dark color. Missing elements, which are required for the use case, are depicted in red.

Description of the Approach using the Example Condition Monitoring In order to better understand the application of the proposed method, we demonstrate the use of the Analytics Canvas for the conceptual design of a condition monitoring application. This is

shown in Figure.



Basis for the Analytics Canvas is the layer “data analysis”. It aggregates the functionalities of the data analytics applications according to the layer model shown in Figure 3. The four stages descriptive, diagnostic, predictive and prescriptive serve as a guideline for the determination of use cases. The first step for a user of the Analytics Canvas is to fill out the layer "analytics use case". Based on identified potentials for improvement in the company, analytics use cases are defined.

Subsequently, the "resources" layer is specified within the "data source" layer.

Machines are listed for which the condition monitoring use case shall be implemented. In the example of Figure 6, this is a welding robot. Furthermore, it is defined whether the data is collected manually or automatically from the resources in the "data source" layer. In the presented example, the welding robot has programmable logic controllers (PLC). The "data description" layer specifies in detail which data is required by the machine. In this case, the welding robot needs the parameters rounds per minute, motor current and temperature. The fact that the parameters are written in black and not in red indicates that the parameters are already being collected by the PLC.

Afterwards, it is defined where the data is stored or where it should be stored in the "data pools" layer. In the application example, there is a database called production database. The presented welding robot’s PLC is connected to a production database where the data is stored. The complete procedure for using the Analytics Canvas is shown in Figure 6

CONCLUSION

The role of the Business Analyst is very not something that can be put into a single framework. The job of business analyst changes according to the company he/she is working because every company's requirements from a Business Analysis are different. Business Analysis is the enablers of any project and as every project has its own nature the framework uses to solve them cannot be the same.

This paper has attempted to study 6 of such frameworks to enable us to understand what are the different roles that a Business Analyst must perform to get the job done.

REFERENCES

[1] Muhammad Nabeel Mirzaa , Zohreh Pourzolfagharb,*, Mojde Shahnazaric , Significance of Scope in Project Success , Procedia Technology 9 (2013) 722 – 729

[2] Mohammad Mehdi Ravanfar, Analyzing Organizational Structure Based on 7s Model of Mckinsey, Global Journal of Management and Business Research: A Administration and Management Volume 15 Issue 10 Version 1.0 Year 2015.

[3] Clyde Holsapplea,∗, Anita Lee-Post b, Ram Pakathc, A unified foundation for business analytics, Decision Support Systems 64(2014) 130–141

[4] Bridgingthegap.com

[5] https://en.wikipedia.org/wiki/McKinsey_7 S_Framework

[6] https://www.bridging-the- gap.com/business-

analysis-process/

[7] https://www.mckinsey.com/business-functions/strategy-and-corporate- finance/our-insights/enduring-ideas-the- 7-s-framework

[8] https://en.wikipedia.org/wiki/Business_analy sis

ACKNOWLEDGMENT

I would like to show my grateful feeling to Prof. Prathamesh Nadkarni Sir, who encouraged us to write this paper with whose supervision I accomplish this task in time. He is always patient to help me out with questions in terms of administration and rules. Thank you very much Sir!