ABSTRACT

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Abstract

The need of qualitative data is becoming of primary importance for enterprises and there are different approaches, leading toward the increased importance to manage the core business data referred as Master Data Management. This concept if not new, there are different studies and different software solutions that address master data. However, the concept can be applied differently in organizations. In a geographically spread company the complexity increases due to the nature of operation. The aim of this study is to capture the real life factors influencing Master Data Management (MDM). More specifically, this research focuses on providing additional insight on the main factors from the three internal working domains, namely Business, Finance and Informtion Technology (IT). Subsequent to this, observations were made from the two main angles of a global financial organization which are Global and Local (country-level). A global enterprise is influenced by 11 main factors regarding MDM such as data quality, culture, projects, definitions, etc. Taking a deeper look into these factors we created three main classes of influence, Data Properties, MDM Influencing Factors, and Sociological Factors. These congregations have their own relations with each other and they have not the same impact on corporate and country level.

Key words	Master data management, governance, influencing factors, international company, internal domains, coroporate, local offices.
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MASTER DATA MANAGEMENT IN GLOBAL ENTERPRISE

Master´s Thesis
In International Master of Management
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1 INTRODUCTION

1.1 Background and motivation

Nowadays data management is becoming a main driver towards the success of companies on the market, more specifically for global enterprises. Data has become an important asset of global enterprises and they are more and more aware of the impact of data. Because of this, more companies are investing in technological tools on different areas. Companies are trying to make data more reliable with better quality. However, these solutions are generally developed in silos and they are not connected to each other. The result can be that segments of the company generate high quality data while other parts of the company generate lower quality data. The departments with lower quality data need improvements of the data and due to the projects between different segments of the company, the departments with lower quality datahave a bigger impact on the company. From a long term perspective, if departments differentiate in their solution for better quality data, it does not help in creating a global view of global processes, such as data flow, control and reporting. In correlation, management of future projects becomes time-consuming and costly, due to globally dispersed systems and projects.

As per reference, a simplified version of how data is developed would be a country of islands. Each island is a different domain inside the same global enterprise. Some of the islands are bigger, they are more developed and there have been more investments in them. From a holistic corporate level, there is no connection between the islands, making the management of data challenging. Some might argue that there is no need for any connection, a technology solution will solve the problem, however a technology approach in creating ‘bridges’ is still not an optimal solution.

The role of data and how it is managed is a driver towards the profitability of organizations. The focus on the importance of data management is not a new development. Throughout the years companies have been trying to purchase or develop different solutions to organize the data. For small or medium (SME) companies data management is easier to deal with. However for global enterprises this is a more complex task due to internal and external factors. For instance, the residing market in which the company operates has an impact on the required data quality.

This research focuses on corporate center of a global financial company where the information derived from the data is crucial. Different sources and different perception of data importance on a corporate or country level have created different definitions and different importance characteristics among different departments. Another influence on the creation of these definitions is the usage of legacy systems. These systems are spread geographically and they generate and manipulate data on their own before send-

ing the data to corporate center. In addition, on corporate level there are different data formats and qualities on which intervention should be applied. The different data that are gathered have in common the core data which business and finance departments need to perform their analyses. Core business data is leading towards master data and many departments are becoming aware of the urgency for this type of data, which will be explained in the next chapter. Inherently different departments have created their own core data in order to report consistently, over the years this entails definition challenges.

The need for master data is becoming more and more important for the future of international organizations due to many factors, for example regulatory and compliance-obligations, and digitalization. Having a unified view on how departments see master data in their own domains and how this data is maintained has its own influence on the company, mostly on corporate. The different need for data on a corporate level is different and sometime not understood from country level. Data that is gathered by the corporate is not the same as the one gathered by a country office. On a corporate level there is a need to control the business data that makes the business run on a daily bases. This data is referred to as master data. Due to the history of global organizations, their legacy systems, acquisitions, shared services centers, etc., master data have different meanings between departments/domains even though it is the same organization.

The three main domains discussed in this thesis are Business, Finance and Information Technology (IT). These domains chosen are worthwhile because of their relevance and importance for MDM. The domains have been investigated thoroughly from two different perspectives, respectively the local and corporate level in order to create an understanding of the components influencing master data. Below we discuss the importance of the three domains specified above:

- The **IT domain** was the first selection of the research due to its crucial importance in MDM. Its department and resources ensure the ‘how’ of MDM, technology wise. The people from this domain that are involved have a big influence on this topic as they are more aware than the other domains of the importance of master data. In addition, their knowledge of the current technology in place, different ongoing projects and infrastructure is essential in determining the success of a project.
- The **Finance domain** comes second due to the involvement in manually correcting the data definitions and generating the relevant reports. The teams of this department deal with the data issues every day and their experience and knowledge in determining the significance of data is important.
- The **Business domain** has also been chosen to be evaluated because of the need of qualitative data for this domain in order to make decisions fast. Moreover, the teams involved in this domain are the ones that extract information

from data, and according to this information they perform additional business tasks which involve also additional partners such as dealers.

The research will provide more academic research on MDM in global enterprises, where research conducted on this field is generally done by technical department of the companies, "white papers", and it is focused more on the systems and databases. The research will analyze country and corporate-level factors toward MDM. Moreover it will try to provide a link between data, management, master data, legacy systems, and other elements that affect master data initiatives. The research focuses on global companies, where data is collected, analyzed and decisions are made by the corporate center. There is not a well-defined way how global enterprises deal with collecting data from different sources with different tools, and moreover how this data is standardized. Data flow process is defined by department scope and it makes it complex to be seen from high-level, making future projects developed partially in different segments of the organization. Standardization on the other hand might be risky as it might have financial impact on the outcomes of the departments operating in different countries, where flexibility plays an important role. The discussion in the thesis is framed within the concepts of data quality, systems, decision-making, governance and MDM benefits.

1.2 The study aim and research questions

The study aims to create a better understanding on the importance of MDM especially in global organizations and the main aspects that influence it. Furthermore it tries to analyze how the different high-ranked employees visualize master data, the benefits from it, and how it affects them.

"*We are doing quite fine, the company has expanded very much and it's the first in this market. So why should we do it? It is not a problem for this company*" – replied one of the interviewees. Seen from a business and commercial point of view this is correct, the financial company is working efficiently and its investments are profitable. However, in terms of data, manual intervention is required either from IT or business side. For the moment there may not be any need to develop a MDM project that will change the organization. Soon this type of organization will need to have more knowledge about its data, according to grounds found in the literature. Regulatory and compliance on the other hand are putting a lot of pressure and reporting has become crucial. As stated by several informants, "*Regulatory and compliance is one of domains that is sponsored quite a lot and we always find a way to align with their new regulations*". The ability to always comply by finding manual solutions has its hidden costs and is especially connected to the internal processes. Keeping the focus on data, the more complex the internal structure is the more difficult it becomes to control and update it. This has led to an

increased awareness of the importance of data quality and it has generated again the discussion about master data. Different departments have different needs in terms of data, and it is not clear on a global holistic level how this should be provided. The approach '*we see and we do'* makes the departments not aligned with each other, therefore creating different 'islands' inside the organization with different data definitions. Moreover their misalignment with each other has a strategic impact on future projects.

In this thesis we aim to answer the below questions:

1. **What are the main factors that influence MDM in business, finance and IT domains on global enterprise? How do these factors influence each other? How do they interact with governance?**
2. **What are the different perceptions of MDM on corporate level and country level?**

The research aims to contribute to the research of MDM in global enterprises in the following ways:

- By extending the current literature on MDM in global enterprise
- By providing insights of how master data is perceived in global enterprises
- By evaluating MDM in a managerial way rather than technological one
- By creating a link between local and global view of master data

This study gathers the opinion of 21 experts in a global enterprise and analyses their opinions and outlooks of the current and future state of MDM in the organization. The experts are chosen from business, finance or IT domain; with long working history inside the company. The idea is to provide different views which will be examined by this research. It will focus on the confusion and different issues residing by not having addressed properly a MDM process. Moreover the idea will be expanded on MDM initiative observed from the business, finance and IT domain in terms of corporate and country level.

1.3 The case company and its major operating domains

The case company operates in the financial market, more precisely in the leasing sector. The research has been conducted in the corporate center. The company is categorized as a big company with more than 5000 employees working in 35 countries. Due to the financial nature of the organization, finance and business development play an important role in the company. Financial information is an important criterion in predicting investments, contracts and global customers. Since the company is an old one, having little less than 50 years, the maturity level is high. The organization performs business with different partners, local and global and has different kind of agreements with them, making the company profile very complex. Local offices play an important role in gen-

erating the data on their front office systems and submitting it to the back office ones. The legacy systems in place play an important role in sending data in corporate, but due to their usage, country and flexibility level they generate different definitions and data. The company is focused towards agile approaches and result-oriented.

The case company main activities operate in three major domains which are referred to as Party, Contract, and Products domain. The first domain is very complex and together with the contract domain generates business value for the organization. Contract domain generates extensive internal data evaluated in branch offices as well as corporate. The last domain evaluated in the organization, is the Products domain. The data detail in this domain is even bigger compared to both previous domains, adding a layer of very detailed structure of data. The Party domain is the more matured among the three in relation to regulatory and compliance, however different legal entities can cover all the three domains. The third parties involved in the business side are referred to third party known as Dealers. Consequently the complexity level is high by means of processes.

2 LITERATURE REVIEW

2.1 Master Data Management: definition

This chapter will focus on providing some definitions in order to have a better understanding of MDM. It is not a new concept and there have been different researches in the past about this topic. According to Ahern (2006) MDM is a '*set of policies and procedures for accessing, managing and maintaining a single version of master data and for coordinating the data with subscribing systems across the enterprise for the purpose of maintenance, analysis and reporting*'. This first definition gives the first idea of "single version of truth" in the context that core data have the same meaning across all systems in the enterprise. Furthermore it gives also a view on the areas in which the master data need to function such as analysis, reporting and maintenance. However, Ahern (2006) mentioned the "*coordination the data with subscribing systems across the enterprise*", which is relevant for this research as it is focused on global enterprises. Another salient definition explains "*Master data management is defined as an application-independent process which describes, owns and manages core business data entities*" (Boris - Andreas 2010). This definition encompasses a very important concept regarding 'application-independent process' and it gives a very straight-forward explanation for master data referring as 'core business data entities'. Smith and McKeen (2008) define as follows: "*Master data management is an application-independent process which describes, owns and manages core business data entities. It ensures the consistency and accuracy of these data by providing a single set of guidelines for their management and thereby creates a common view of key company data source*".

Another definition, considered for the customer domain data for a global enterprise, is provided by Berson and Dubov (2007) as follows: "*Master data management is the framework of processes and technologies aimed at creating and maintaining an authoritative, reliable, sustainable accurate and secure data environment that represents a single version of truth, an accepted system of record used both intra and interenterprise across a diverse set of application systems, lines of business, and user communities*". The last explanation is a broad explanation of MDM in global environments and the relevance for this research is quite high. However, due to the different kind of companies and markets the approach should not only be targeting the customer dimension. Another author that has given more details in this matter, Dreibelbis et al. (2007), gives another view towards MDM pointing out that it serves more operational or analytical purpose and it relates the collaborative, analytical and operational data.

In addition, Loshin (2009), proposes a very similar approach with names such as '*Operational Usage'*, '*Reference Information Management'* and '*Analytical Usage'*.

The author divides master data into people, things, places and concepts. People refer to the employees involved such as customer, employee, vendor, etc. Within things, they refer to products, store, assets, etc. Places are the locations and geographic offices. Last, concepts converge to contracts, agreements, etc.

As a synthesis of above discussion, we use in this thesis the following definition for Master Data and MDM: "*Master Data is related to the core business objects that are used by different applications across the organization in order to describe key business entities. Master Data Management is the process of having in place a structured method of creating and maintaining master data as a single source of truth."*

In short the term MDM is used in multiple meanings and from different perspectives, but while the definition is quite vague and can be seen from different angles, the problem is not. Many organizations have focused too narrowly only on the system part (Lee et al. 2006), but generally data in a large number of global organizations is not standard and there are different definitions in place. The IT global landscape is complex with legacy systems, applications, tightly-coupled systems, multiple data warehouses, and unstructured input-data across all geographically dispersed systems. This complex IT structures makes managing information difficult (White - Genovese 2006). Many organizations face various inconsistencies in data formats, values, definitions, etc. This is a consequence of developing data in silos. This has not become a problem yet for the case company observed in this research according to most of the people involved, and that is why it is still not considered of high priority. There are some factors that are aggravating the problem. First, the technology ability to store more information has vastly outstripped the organization ability to manage and analyze data (Davenport 2007). Secondly, the development of solutions such as ERP, CRM, databases, etc., has often unwittingly contributed to further data confusion. Vendors make use of expensive and complex technology solutions aimed to provide a single truth of the enterprise, but this has added another layer of complexity (Fisher 2007). Third, the governance body is not in place and there is not a clear ownership of data (Flint 2004).

Organizations are beginning to feel the need to manage data globally, trend analyses, and enriched data from cross-functional systems. Hereafter the easiest solution for the companies under pressure is to develop short-term solutions for a particular need or particular region where global enterprises operate. Concluding, organizations want high-quality data but they lack a roadmap towards it, because of this each time they use manual solutions (Lee et al. 2006). MDM is being seen as a roadmap facilitator to generalize data in a cross-domain function, achieve consistency, and remove data-silos (Friedman et al.2006).

2.2 The difference in data of small to large organization

Organizational growth is tightly connected to MDM, even more if a company is global (Graham 2010). MDM becomes critical when the international business grows because it impacts the organization's success in the market. Acquisitions and other collaborations bring new sets of data that should be integrated and merged with the existing business. New customers, dealers, manufactory etc., extend the data complexity. According to Graham (2010) from a Microsoft review paper about master data in organizations the organization size impacts MDM as shown in Table 1:

Table 1 The difference in data related to the size of organization

Org. size	Characteristics	Central Challenge
Small	Small master data involved. Integration easy and not priority	A plan to scale along with business over time
Medium	Data stewards begin to be defined as integration complexity increase	Effective controls in place and standardization
Large	Big amounts of master data spread in big number of systems. Data silos in place with relatively consistent attributes	Consensus among stakeholders. Many integration points
Conglomerate	Many disparate business that create different groups of data	Determining the level at which master data lives

In order to provide a more complete view of the impact of the size of organization on MDM, this research combines the literature of Dreibelbis (et al. 2007) with the white-paper of the Graham (2010). The coupled explanation is abbreviated below:

- **Small company**. Small businesses do not consider master data challenges as important, therefore the way they are using their spreadsheets for their product list or other accounting systems is easier to manage. The number of systems is small, and managing the datasets is easy. However, when the organization is predicted to grow, this is the right time to begin a master data initiative starting with the creation of a management strategy for the data. This would result in a more easy implementation of newer systems.
- **Medium company**. Mid-sized organizations have already implemented dependable systems for each set of master data and in this phase integration becomes crucial. The definition of the owners of master data for each dataset is implemented and makes the working groups effective and they take care of new data systems integrated inside the organizations; the people that manage the current and new domains inside their group are usually called data stewards.

- **Large (global) company**. Implementation and management of a comprehensive master data solution in large organizations is complex. The organizations have several stakeholders for each silo and many systems rely on the same models. The main concern for these kinds of organizations becomes coordination of data. The diversity of products, customers, vendors, and other offerings is makes them more difficult to manage. Global companies tend to have more than one domain of importance for data, such as asset master, customer master etc., and that is why it becomes difficult to estimate and perform reporting. On the other hand it is complex to evaluate the cost benefits of having in place a MDM solution. Quick results are needed to support a MDM project ongoing.

As result of the combined approach, we conclude that MDM becomes essential for companies that grow (Graham 2010; Dreibelbis et al. 2007). This approach focuses on phases of planning, implementation, data exchange, and with main objective of creation and establishment of high quality data from different source systems.

2.3 The importance of data quality in global enterprises

The amount of data retrieved has increased relatively high due to the amount of detail and customer focus approach. The quality on the other hand is still a problem in terms of unrecognized data issues, misunderstood definitions, non-relent data, wrong processed data, etc.(Loshin 2009), for example the ones caused by the combination of the proliferation of duplicates, inconsistencies, misinterpretation, filtering, etc. From a business intelligence perspective, handling all the challenges with the huge amount of data from separate systems have become a challenge that global companies face every day. The term ‘automation’ causes a lot of confusion because of the dispersed and diverse legacy systems. The sooner it is figured out how to automate the retrieving and filtering of the content data, the more optimal the generated reports are.

The German Society for Information and Data Quality (Malzahn 2008) provided a categorization for data/information as intrinsic, contextual, representational and accessible. As the names imply, intrinsic data quality is focused on the correctness and objectivity; contextual data on the relevance of use; representational data on understandability of data; and last but not least accessibility of data focused on how the data can be accessed. In addition, Van der Linden (2009) proposed a framework, in which the categories are expanded to more subcategories and they provide a better view of data quality, Figure 1.

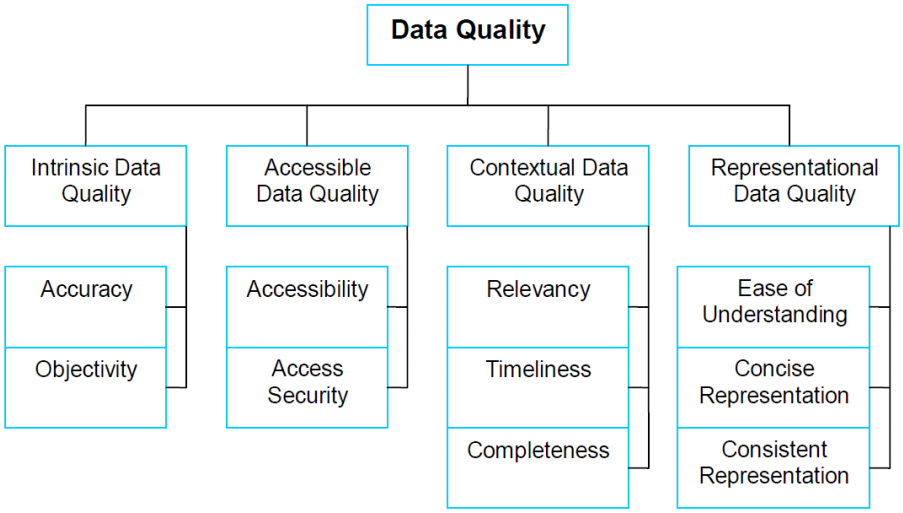


Figure 1 Data Quality (Van der Linden, 2009)

However this research's main focus is not data quality, therefore it does not analyze in detail the data categorization according to the Information Quality Framework by Van der Linden (2009). The reason the investigation takes into consideration the quality of data and the above framework is to create some base ground for master data detail view, as it will be explained in the next subchapter.

2.4 Business intelligence data and decision making process

Business Intelligence (BI) focuses on data, moreover in processing and retrieving information for creating reports for different managers or segments. The main objective, however, is to provide the right knowledge to the right people at the time needed. In short, data enrichment by BI helps the decision making process by providing the right view of what is happening in different regions, countries, continents, or even globally. If the quality of retrieved data is low and the retrieval time is big, then many manual interventions are performed on the data. As it will be claimed later on in this thesis by the employees, manual intervention and data retrieval-time is taking lots of efforts. In order to provide consistent information at the needed time requires not only a solid BI solution but also the right mixture of IT systems, infrastructure and data collection processes. According to Kearney (2011), he acknowledges that "*Better decision making with proper business intelligence*", BI has a proven impact on key performance indicators (KPIs). He emphasizes in his research that 60% of executive managers state that the use of the right solution of BI as a performance management tool has a positive impact on shareholder value, and there is a considerable increase in Return on Equity (ROE).

BI solutions use historical data to perform real time decisions and anticipate the future of the market trend and customers. Business intelligence maturity is in itself a process that requires time. Business intelligence, as a concept has been brought up by Gartner Group and it has been defined in the beginning as a set of methodologies and techniques such as J2EE, XML, data-mining, etc., to improve the performance of operation effectiveness and support management (achieve competitive advantages). According to Gartner, organizations which have a greater success with BI go across a specified path. First they start with basic data and small algorithms and analytical tools and they end up with sophisticated solutions, which influence their way of decision making. This research depicts the three-most important stages in which organizations gradually grow (Kearney, 2011):

- **IT-Focused**. Firstly the companies use BI as an approach towards IT initiatives and more focused on just data collection and selection. In this step the decision-making process take into consideration the historical data and based on the analysis conducted on them some decisions may deviate from the initial proposed ones.
- **Information Management**. In this step decision is more influenced by the data retrieved by CRM or even ERP applications. Decision-making process becomes a real-time process and BI tools influence it more than before, making it essential for keeping the business going and keeping up with the current customer expectations. On this step organizations use BI to manage the information and especially to measure the performance against the decided business plans and strategy.
- **Predictive Insight**. In this step the organizations have implemented or purchased customized and advanced analytics and predictive approaches to anticipate the market and customers. BI tools have already reached their maturity level in the company and have already become part of the decision making process; moreover their influence is vital to the organization.

A business intelligence system allows managers to make decisions using real time data by monitoring competition, carrying out constant analysis of numerous data and considering different variants of organization performance (Olszak - Ziemba 2007). Basically, data is retrieved from different sources such as CRM, market, competition, legal entity government warehouse, etc. there are different levels of decision making and in Figure 2 we illustrate how data affects different layers of the enterprise.

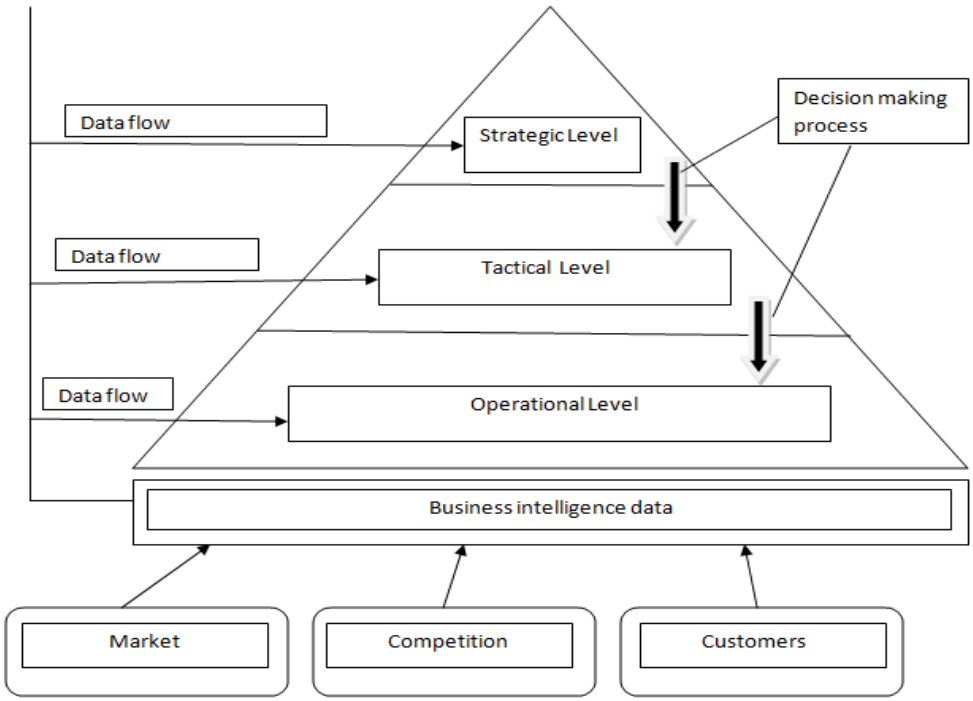


Figure 2 BI data influencing different levels of decision-making

- **The strategic level decisions**. It is the highest level of decision-making and BI support this level by providing a set of results, such as historical, offers, market, and forecast. BI results ensure the continuity of the company in the market. Furthermore, with the help of BI results top management can forecast future changes in the organization, in both internal and external environment (Olszak - Ziemba 2007).
- **The tactical level decisions**. These decisions are mostly focused on planning and they rely on real-data about sales, marketing, finance, investments and management (Olszak - Ziemba 2007). The support of BI becomes vital as it analyses any deviations from the realization of plans in internal units of the company, individuals or groups. Several decisions are made in connection to marketing, finance, sales, etc., and forecasting of demand of customers.
- **The operational level decisions**. These decisions are generally focused on financial data and cooperation with suppliers, end-customers or partners. BI addresses and analyses informational data that includes bottlenecks in terms of operations, analyses of the best-functional operations and the ones that are not productive, analyses employees, customers, regions, departments (Olszak - Ziemba 2007). The information extracted by BI is more a summary of the all mentioned above and it is analyzed with other external information in order to increase the operational effectiveness and productivity.

2.5 Consequences of Poor data management in a global enterprise

If master data is not consistent, organizations will be less reactive to new bureaucratic compliance and they will not be effective enough in setting up reporting processes (Otto - Hüner 2009).The loss due to poor data are mostly of financial terms. We have taken into consideration the most negative effects of poor data management according to the literature reviewed for this topic and present the most relevant ones for global organizations in below (Van der Linden 2009; Otto - Hunner 2009):

- **Loss of sales opportunities**. Cross-selling of products or services, ability to keep up with new trends or analyze customer needs (Van der Linden 2009). For example wrong customer data might lead to incorrect target group analyses and thus failure to new market penetration.
- **The costs of customer service**. Costs are created through the time consuming process of correcting customer data. Employees are forced to correct these kind of data resulting in customer ser vice costs and this is easily calculated by allocating the time of an employee spend on it.
- **Customer dissatisfaction**. It is hard to measure, but it could originate from different errors such as errors in names, billings, product information, etc. Moreover, the bad experience has an indirect effect of spreading it among other customers. However, the direct effect can be evaluated by the customer lifetime value (Jain - Singh 2002) defined as the net profit or loss that one customer brings to the company throughout the whole life-span.
- **Operational inefficiencies**. Inability to react in time, poor planning, increasing system workloads, etc. are considered operational inefficiencies because they are addressed in the operational work flow (Van der Linden 2009). Moreover, finding the source of the operational inefficiencies becomes a hidden cost to be estimated. These kinds of incidents are related to poor data quality and the work process has to be stopped to make additional correction of errors on data. Of course, the impact can vary different depending on the business area.
- **Delays in project deployment**. Delays or even cancelation of new products or system introductions are also related to data management. The risk and cost of successful project cannot be evaluated but low data quality is definitely a burden for success.
- **Regulatory compliance**. The inability for an organization to adhere to regulatory compliances has a severe consequence that impacts directly the future of the organization, even more in banks or financial institutions (Otto - Hüner 2009.
- **Decision making**. If the companies would have more precise information about the customer then business intelligence applications would be more effi-

cient and therefore the company could have improved services, increased sales, and better understanding of its customer. In the case of poor data, or erroneous or outdated data incorrect forecasting and decisions are made.

- **Loss of business opportunities**. Business opportunities are partly related to customer opportunities, however in business opportunities the focus is on the upstream relationships (Otto - Hüner 2009). Costs are produced in incorrectly analyzed internal and external data. For example the company may miss the opportunity to buy resources at cheaper prices and this kind of risk is connected to incomplete market data.
- **System credibility**. Due to the low trust of employees within an organization, different departments build their own databases with spreadsheets. This means that systems containing the same data sets are organized differently.
- **The morale of employees**. Rising dissatisfaction of the employees due to bad data quality has its own costs because the employee would have to correct data and perform his/her primary tasks (Van der Linden 2009). Decrease in productivity is the direct impact of this.

After having provided the most relevant consequences of poor data management above it makes sense to analyze how master data improves the situation in terms of benefits, which is analyzed on the next chapter.

2.6 MDM benefits in a global enterprise

The most difficult part in establishing MDM is on-boarding stakeholders and executives. MDM has not become a problem or visible yet. In the current environment MDM is more seen as a possibility rather than a future problem. Today there are many software solutions on the market that offer MDM solution; however this kind of approach without internal understanding has a high possibility to turn into a partial success or failure. A technological solution is not effective if it is not comprehended and established by some governance body inside the organization, because it needs huge investments and resources (Loshin 2009). The benefit of better controlling data inside the organization is clear but it seems not crucial because of the difficulties to evaluate the cost-benefits and in most cases the created business case is not compelling enough (Smith 2008). While less complex initiatives such as data quality and cleansing can provide feedback within 1-2 years, MDM is seen as a long process and evaluating the benefits is quite challenging (Friedman et al.2006). The benefits of MDM in global enterprise, referred to the examined literature, are provided below:

- **Single source of truth** - A single version of truth and the ability of the whole global organization to report on a single data source is the ‘holy grail’ accord-

ing to White and Genovese (2006). Furthermore it addresses the question that most shareholders, executives and regulators ask, that is "*What kind of company doesn't understand who its customers, products, and suppliers are?"* (Fisher 2007). Consistent information ensures better operational efficiencies, competitive differentiation, reporting, better decision making and it reduces the chances of disagreements within the businesses of whose data is right (White et al. 2006; Delbaere - Ferreira 2007).

- **Stewardship of data -** Stewards can be given the latitude to define the data on a corporate level and then define data rules for departments inside the organization. The stewards would be responsible for the definitions in place and would update them accordingly. The benefit of having stewards in place is that they create a common understanding of the definitions agreed upon. This would create a single view of data on the inside and outside part of the company.
- **Cost saving -** Across the organization there are different cost savings attributed to MDM and mostly they are connected to the improvement of poor data spread crosswise the enterprise. These costs are generally spread disparate and incremental. There are two types of business costs that are avoided by having MDM in place which are costs caused by poor data quality and cost caused by assuring data quality (Lee et al.2006); both of them are related to the costs of detection, repairing and preventing of poor data. On the other hand operational efficiencies and better usage of resources are indirect savings attributed to MDM since they are attributed to the availability of information (White et al.2006).
- **Improved business capabilities -** According to Friedman (2006) organization are beginning to realize the importance of data management and its ability to improve agility, performance and effectiveness. Data consistency becomes critical when dealing with partners and suppliers, particularly in global enterprises. The importance to have trust in the market is a key feature that once it is lost it will be difficult to be regained. In terms of customers, data accuracy will help retaining the customers.
- **Improved technical capabilities -** Eliminating data redundancy, reuse of data and leveraging of corporate data reduces the work in providing business information (White - Genovese 2006). On the other hand introducing a new system when there is a clear MDM strategy in place becomes easier for global enterprises.
- **Regulatory compliance -** Since September 2001, several newspaper have been discussing regulatory compliance due to the Enron case. Many controls are in place today to ensure financial stability of enterprise especially global ones. The number of regulations that a company must adhere to has been increasing

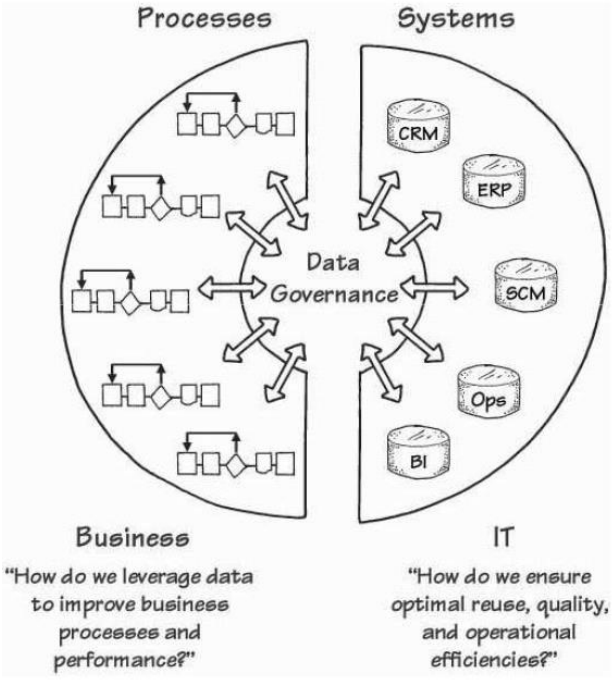
over the time. According to some study from Financial Executives Institute, an average of $3 million is spending to comply with section 404 of Sarbanes-Oxley (SOX) (Wayman 2005). Moreover, research estimate a $150 million five-year cost of implementation of Basel II by largest banks. There are different regulations and some of them are global and some are specific to countries. Obviously implementing solutions for each regulation separately is not viable. The enterprise should see the solution in a more holistic way in order not to implement new silo systems for future regulations or updates. On the other hand, achieving regulatory compliance, because is mandatory, does not add anything to the bottom line, so this can be seen as pure cost in order to avoid any financial penalty.

2.7 Importance of data Governance

The MDM issue is materialized into data repositories. Redundant or incomplete data reside inside databases and they are managed by internal systems either from front office or back office. The tangible, immediate effect of data challenges is highly technical; however its origins and solutions are broader, and relate to enterprise architecture and processes to manage data. Thus, solving the inconsistences in the actual data is only part of the solution. The most difficult part is to implement processes that would prevent incorrect data from the start. According to Radcliffe (2009), the challenge is not of a technical nature, but rather related to governance. Data governance has the potential to create a leap forward towards management. According to Chen (2010) successful implementations of data governance will need long-term investments. And observed from a global perspective this long-term investments are costly, therefore governance becomes of primary importance. The need to have governance ensures that the benefits are continuously emphasized and they don't vanish over time. Loshin (2009) affirms that MDM is an enterprise initiative and for this reason focuses on the need of assurance of stakeholders that adhere to the rules specified in governance. In addition master data governance has to be part of the corporate in order to be managed comprehensively (Radcliffe 2009).

Data being managed as a strategic asset is present in businesses with mature data governance models (Chen 2010). An institutionalized governance process has become a permanent business function in terms of data organizations. As investigated thoroughly on different literatures, reaching maturity is not an easy task in terms of master data in global organizations as there are a broad variety of departments and definitions to be evaluated. The importance itself relies in the ability of the company to have a clear understanding and lay out of its master data and its governance. Within context govern-

ance of IT is not a new discovery for enterprises. Since 2004 van Grembergen defined IT governance as a key driver towards sustaining and extending the strategy and objectives of the enterprise through leadership, organizational structures, internal processes and other relational mechanisms. The definition focus on tree pillars named organizational structures, processes and relational mechanisms; implementing IT Governance, in a nutshell, is a mixture of those three elements. The author emphasizes that a given IT Governance implementation is contingent on conflicting internal and external factors. Therefore a unique combination of these last ones is applicable only for one company. Loshin (2009) depicts that in order for organizational data to live up with the expectations of the business purpose, data governance should ensure all the different perspectives of stewardship, privacy, compliance, security, meta-data management and MDM. According to Loshin (2009) master data management is seen more as an enabler for data governance program of the organization. Another example of governance in a real world scenario is provided by Dyche and Levy (2006) visualizing it in the middle of the processes and systems:



Source: Dyché & Levy (2006)

Figure 3 Governance bridging the gap between Business and IT

Today the world is changing at a very fast speed and the market also, making even agile companies to have difficulties keeping up with it. Despite the complex nature, MDM in global companies has become a driver towards success. It affects decision making and more importantly the future of the enterprise. Data is sent from different geographical dispersed offices, non-standardized resources, front office systems, etc.,

and its enrichment becomes of primary importance (Power - Hunt, 2016). However, having different sources of data inside a global organization that are dispersed globally and not standardized due to different developments or acquisitions, make master data governance a complex task. Moreover, the need of master data definition and management becomes crucial and the master data embodies the core business activities in the company. MDM does not only reside on the data itself, or the processes; it is dependent more on the alignment of business with IT. The idea behind it is that business guides the implementation and usage of master data in accordance with the corporate goals and strategies, while IT builds and operates the architecture of MDM (https://msdn.microsoft.com/en-us/library/bb410798.aspx).

Different organization have different approach on governance, however in terms of master data, there are eight considerations according to the MDM governance whitepaper of Power and Hunt (2016) that must always be considered:

- **Recruiting a senior executive from business domain**. The selected business executive, chosen to be leading this kind of project should have a good understanding of the business processes, departments, decision making, organizational data flow, etc. The preservation of momentum of MDM project aligns to the political standing power of the executive in the organization. Keeping the project ongoing is not an easy task. MDM program has a big impact and it is a big initiative, therefore someone with low or medium political power might not be able to bring this large scale change over in a timely process. Furthermore, there might be other important projects ongoing in the company and someone with lower power would make the process priority decrease and even disappear over time. The background of the executive is crucial. Master data is perceived as an IT integral part (Power - Hunt 2016). However, IT helps the MDM initiative, but it does not apprehend some important dimensions such as business processes, decision making, business rules, etc.
- **Creating the business case**. The translation of the business need and value into a business case for MDM is a critical point and not considering it would make the project a waste of time and investment. Over time the people involved and affected by the project will begin to forget why the project is being done; therefore having a clear business case would help not to lose focus and have retained a clear vision of the benefits (Power - Hunt 2016). The benefits need to be clear enough in order to make it easier to connect with the corporate objectives, strategies and goals. IT involvement is also important, as the solution that the organization should implement is based on technology that is achievable by bottom line.
- **Setting a rational scope**. Setting the scope of this project too big would make the initiative impossible to achieve while losing interest from stakeholders.

MDM is a continuous and long balancing process between strategic and tactical dimensions (Power - Hunt 2016). Starting with initial quick objectives would be a good approach, however the MDM initiative should be designed to adapt to the future needs.

- **Organizational and cultural change**. The aim of MDM project is the reduction of data and business silos, global standardization and consolidation of master data in accordance with related quality (http://searchdatamanagement.techtarget.com/feature/Designing-an-MDM-project-plan). In order to address these silos, it is required to examine cross-functional processes that are managed by different people and different departments, increasing communication importance. It is in human nature to resist change but discounting the resist will lead to a failure of the project. The relevance of reasoning to resist change for some departments or offices are real, therefore the urgency to discover and comprehend the issues becomes important. To be taken into consideration are also the old processes that would need to be replaced or updated, sometime they become barriers (Power - Hunt, 2016).
- Considering a **single dimension approach**. For instance, having a target broadly focused on technology and 'how' to achieve it rather than business would complicate and make the project fail. Combining non-technology elements with people, practices, processes, and other relevant elements would make the master data initiative not lose the 'big picture' that the initiative established and develop only differentiated parts of the organization (Power - Hunt 2016).
- **The governance group**. Managing the data, data flows, quality, master data etc. is difficult to grow the MDM initiative on the agreed level. Data governance team is the main actor in aligning people from different domains, processes, technologies and practices with business strategies, objectives and goals of the company; this governance group is essential in defining the business rules for quality of data, making processes efficient and especially managing the business – IT partnership (Power - Hunt 2016).
- **Defining the metrics to evaluate success**. The measurement of MDM value-adding and how it tie to achievements is one of the steps that make the initiative last in time. Furthermore there is a need of estimation of the expected return on investment (ROI). The metrics are needed to quantify the benefits versus the costs of master data, and how it resolves business issues. On the other hand, if the MDM project is based in customer data (Power - Hunt 2016) then the specified metrics to evaluate it should be based on customer retention im-

provements. Not defining the metrics makes the measurement complex and moreover it makes unclear the next steps to come (Loshin 2009)

- **Technologies used**. The different technologies or systems in place need to be evaluated if they are suitable to attend a MDM implementation. The technology solution should be flexible to deal with unexpected changes in the market and competition (Fisher 2007). Technology costs but it is essential and choosing the wrong technological solution would make the project fail at some point. A one-dimension approach would exclude additional entities entitled to other departments. The best decision always lays in between business and IT, therefore a mixture of objectives and insights from both of them would lead to a better technology solution selection (Power - Hunt 2016).

2.8 Master Data creation

In this chapter, we will explain some of the main reasons for creation of core data namely master data in a global enterprise.

2.8.1 Controlling internal Master Data

"*They went to their CRM, ERP, billing and logistics systems to find a list of customers. The result? Each application returned a different list and no system held a true view of the customers*" (Fisher 2007).

Solutions such as Customer Relation Management (CRM) or Enterprise Resource Planning (ERP) should have dealt with master data since the beginning. However master data has not been considered on the time of planning of these systems. On the other hand, the need for data quality and master data was not a well-recognized problem at the time when ERP or CRM were deployed. This is why no attention was paid in these areas and different projects have been organized on country level and the impact has not been forecasted. Today, however, data is becoming an important asset of the company, even more in global financial enterprises; therefore managing all the data under a single view affects the whole organization and future (Fisher 2007). On a corporate level, controlling all the other offices with their own projects and creating a single view is a very complex task and therefore is often not mentioned inside the company until its importance become vital for the company. On the other hand the board of executives have their own projects and their own views on this topic depending on the field of expertise where they reside, making the initiative complex (Fisher 2007). As seen from the corpo-

rate, different structures inside the organization have different specification for different data and there is the need to align all the data specification into one in order not to create silos. Master data has been seen in different terms and it represents different information because solutions are being done in individual regions or departments and not the whole organization. Data can be interpreted into different ways from different people.

2.8.2 Enterprise Resource Planning (ERP)

"*ERP is an instrument which integrates, manages and streamlines data, processes and the people of a firm into one sole system to reach a competitive edge in the business environment."* (Madanhire - Mbohwa 2016). It is a software package assembled by a number of standard functional modules, which serve departments such as production, sales, distribution, human resources and accounting. ERP has the mission of bringing together all the functions of the firm and form a complete system that can fulfill the needs in any corporate department (Millet 2006). In addition, ERP systems can accumulate and integrate all information and skills that represent the whole organization's activity with the final consumer, in a sole database (Berchet - Habchi 2005). With this integration operational costs are minimized, daily management of processes is enabled and strategic goals can be achieved. A powerful Information System combined with proper employee training can definitely promote operational efficiency and increase revenue (Madanhire - Mbohwa 2016). It is very expensive for an organization to move to another solution after it implements an ERP system, as the organizational change that comes with it can be wide (Bingi - Sharma 2016). Almost every ERP solution enables a firm to implement only the modules that it needs, the common practice being firstly the adoption of finance and accounting modules as standard ones, with HR management and CRM modules being employed in fewer cases. Some companies though, have chosen to implement only the best modules of each package, to avoid single vendor lock-in (Botta - Genoulaz 2006).

2.8.3 The necessity for an effective Customer Relationship Management system

CRM functions as a link between individuals and organizations, and managing this kind of relationship can be complex. The complexity of the market and the competition are pushing organizations to invest further in customer relationship and satisfy customers' needs more efficiently. CRM is the strategic solution to secure this business-customer

relationship. "*CRM, Customer Relationship Management, is the strategic application of people, processes, and technology in an organization-wide focus on improving the profitability of the customer relationships*." (Mohammed 2013). "*Companies have improved their customer's satisfaction and they know them better now after implementation of CRM. However, it is very crucial for each business to adopt new technology properly to get its full potential advantage*." (Basahel 2011). From a technology perspective, CRM includes systems and infrastructure for analyzing, capturing, and sharing all details regarding the customer's relationship with the company. The main reason of this product's success is that post-implementation profits are generated fast. Articles and business reports indicate that the companies that have implemented successfully their CRM system have larger profits compared to competitor (Mohammed 2013). The CRM's main focus is to increase revenue by providing high quality service, facilitated by effective internal management. The successful use of a CRM system can provide advantages such as reinforcing customer relationship, value-added services deliverance and advanced service development and distribution (Basahel 2011). In the past, businesses were having challenges in keeping up with high demand as they were only implementing ERP solutions, which focus on the improvement of the flow of data and cross-functional interaction. An interesting fact is that after the implementation of CRM, the economic benefit has resulted almost immediately in most organizations (Mohammed 2013). The most relevant factors that most companies evaluate for the success of a CRM are shown in the figure below:

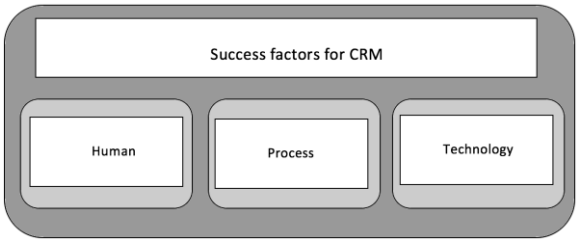


Figure 4 CRM three important considerations (Arab et al. 2010)

The three main factors shown in the figure above play an important role in CRM strategy. The first, human, considers employees as well as customers. These factors are satisfaction, loyalty and value. Satisfaction emphasizes on internal staff and their importance. Loyalty is more focused on the internal culture. The latter refers to the management of the company, its commitment, communication strategy, and assurance for an effective CRM (Arab et al. 2010).

The second (Processes), demonstrates how customers relate to the firm. All business processes, which require both direct and indirect interaction with the customer base, should be analyzed for the assessment of CRM (Arab et al. 2010).Regarding to sales,

CRM also plays an intensive role, as customers don't want to wait to get their services or their bills. CRM provides accurate information and data that can be accessed quickly and efficiently from different location-based sales representatives; accessing the same data on different locations is of great importance for telecommunication organizations. Accounting, shipping and other services must all have access to the same data in order to avoid discrepancies (Mohammed 2013).

The third factor (Technology), is what facilitates the implementation of CRM. Basically it involves solutions such as SaaS (Software as a service) and all the necessary technologies that favor the CRM strategy. Technology offers solutions that refer to operational and computing. Information Technology is an enabler for managing this kind of data with functions and technologies such as sales automation, software for CRM, data warehouses, help desks, call centers, and internet influence (Arab et al. 2010).

2.8.4 Legacy systems and internal culture

Although companies are developing new technologies for analyzing data and reporting, one of the main obstacles that they have is the data generated from their legacy systems from various locations. These systems are of a complex nature and replacing them would require a lot of investment and integration; therefore changing these systems requires much effort and it can become even dangerous for the revenues and future of the company. Legacy systems are also a challenge in terms of flexibility because of their own nature and the time they have been developed. Having a rigid internal architecture makes it more complex to report accordingly to the standards. However legacy systems are important for the company and sometime it is better to keep them functioning.

Basically, a legacy system is not just an application software but it includes business processes and it has also it benefits. A legacy system for global enterprises is business critical as because of dependencies on a global scale and especially the information that resides in them. Moreover, the legacy system has improved over the years and it is global known as a key facilitator for the organization. Furthermore legacy systems are a reliable resource that people know how to utilize. Even CRM or ERP solutions can be legacy systems that organizations have implemented in the past on a global scale and changing or upgrading them to different versions of compatibility requires additional resources and sometime might even not be possible. (Bisbal et al. 1999).

However, legacy systems have their own importance, they are not just some old systems to be replaced or fixed. Companies have invested big amounts of financial resources and they rely on these systems, making them business-critical for quite a long time. That is, business rely on the legacy systems on a daily bases. There are also several risks in replacing these systems and since this is not the theme of this research, it will

just mention them without going into detail. First is the cost. The legacy systems have been already designed to support fully or partially business operations and replacing them would result in an expensive implementation and integration cost residing in different countries (Bisbal et al. 1999).

On the other hand the systems are being used in different ways and it is possible that they have been implemented differently in diverse countries, therefore resulting in even more adaptation cost. Important business rules are embedded into these systems and may not be documented anywhere resulting in a loss of business rules, creating difficulties in implementing a new system. The old systems have become part of the culture inside the organization as the employee have been using them for a long time and have acquired confidence in using them and being part of their development (Bisbal et al. 1999). New systems, or software present a risk itself due to the difficulties of third parties in understanding the needs and values of the solution in different companies belonging to different segments.

2.8.5 Business model alignment with MDM

MDM in global enterprises is complex and there are several domains that need to be considered. In the literature review we have discussed some of them related toMDM such as its definition, legacy systems, data importance, decision making, governance and benefits.

Each of the factors have been analyzed in order to give a holistic understanding of what matter for most global organizations in terms of master data. In order to fulfill the business need for qualitative data, different business models need to be associated with master data. Business Models are the bases that can improve the rate of technological innovation. A fitting business model reveals the potential of a new product or service or some technological initiative. However, there is a restriction of search of some new technologies or business models later, by the logic of the business model (Chesbrough - Rosenbloom 2002). The idea remains that if a company comes up with an innovative idea but still this idea does not fit the company's business model or vision, the innovation will be abandoned. In addition, successful innovations are related to the current business model. Moreover, there are two factors that influence this new innovations appliance which are innovation costs and product short time cycle (Chesbrough 2007). There are also some cases that the innovation influence the business model and they adapt it to the innovation itself, thus a business model is successful when combined with a suitable technology and vice versa (Chesbrough - Rosenbloom 2002).

The business model is also to be considered in relation to a MDM process and the initiative needs to be aligned with the current business model. Therefore there is a tenden-

cy to postpone the project and it goes again to the basic question '*Why we are doing it*?' However, in terms of MDM the business model acts as a driver towards a successful implementation. For example in organizations where information is an important asset, MDM is in synchronization with the company's main domains and their complexity and current maturity level. In the corporate center the information gathered from the sources becomes crucial, while in a country level of detail is higher and it affects only a customer or a service provided.

Requests from the corporate towards local entities (or countries) are often not understood well but still they are carried out as requests from headquarters. When it comes to corporate reporting: "*You have to manage different expectations, different people, different countries, data quality management issues, information issues, people issues but you have to handle that, but in X country we had everything under control."* In conclusion of this part it is easier to handle different request on a country perspective because the data are in place, the contracts are in place, and it is known how things work in terms of reporting, regulatory, etc., however on a corporate everything changes regarding many systems, countries, regulations, people, etc., so the level of data is more concentrated and more on a high level as a result summaries of each country or specific regions. In this angle integration becomes a main complex of corporate and relevant data becomes of high importance in global reporting. On the other hand integration is not an easy task when the number of systems is big and their definition list is even bigger. In this case integration becomes a long and expensive process and global enterprises they don't really like costly projects that have slow benefits.

2.8.6 Managing data is seen as an IT solution

Since data is of a technical nature it is therefore considered to be an IT issue, but its management is not quite technical. The decisions about how the data is retrieved, distributed and manipulated are business ones, because any data management decision should support business after all. Almost every organization is counting on the data from its system, customer, or business procedures because a big amount of decisions from business is made from these data. Real business opportunities arise that the IT department cannot take advantage of due to the lack of business skills (Flint 2004). IT's inability of responding quickly to changing requirements make the data managing process more suitable for the business side. The way data is shared among different systems inside the organization has its own costs and impacts in IT and more importantly in business (Wailgum 2006; Friedman 2006).

3 RESEARCH METHODOLOGY

3.1 Qualitative methodology

Generally the research is classified as either quantitative or qualitative. Because of the analyzed managerial side of the phenomenon, this research is conducted as a qualitative one. Qualitative research aims to provide a rich description of phenomenon that are based on real world conditions, human experience and philosophical approach (Yin 2010; Gephart 2004; Thorpe - Holt 2008). According to Pratt (2009) the strength of the qualitative approach resides in the human expertize and rich description, allowing further examination of the processes. Gephart (2004) concludes that this kind of research is important: "*Qualitative research often advances the field by providing unique, memorable, socially important and theoretically meaningful contributions to scholarly discourse and organizational life*".

This research is based mainly on primary data collected from the different employees related to the questions of interest. The data collected allowed an in-depth observation of the "master data management factors" phenomenon and the different views that it is being seen in mature global financial enterprise.

Conducting a qualitative approach has been seen as more feasible in understanding MDM in a global enterprise. This kind of approach in IS (Information System) research field has increased the last years due to the shift of focus from a technological perspective towards a managerial one (Myers 1997). This study adopts an interpretative approach of the phenomenon and generalizes the conclusions in global enterprise (case company) and its behavior. By doing so there is a clear link between the theories explained in the above chapters and the interviews.

3.2 Research strategy

In order to provide clear conclusions towards the questions asked, the research is thought to go through different phases (see figure below). We collected data from 21 informants residing in three domains which are Business, IT and Finance; in the corporate and on country level. The questions answered created more than ten different common mentioned influencers towards MDM. These themes were grouped and defined according to their relevance. Later on the definitions were split into two big domains in order to be analyzed further from the main angles of business, IT and finance. The main domains created from the answers were also analyzed from corporate and local view in order to generate the conclusions and answer the research questions.

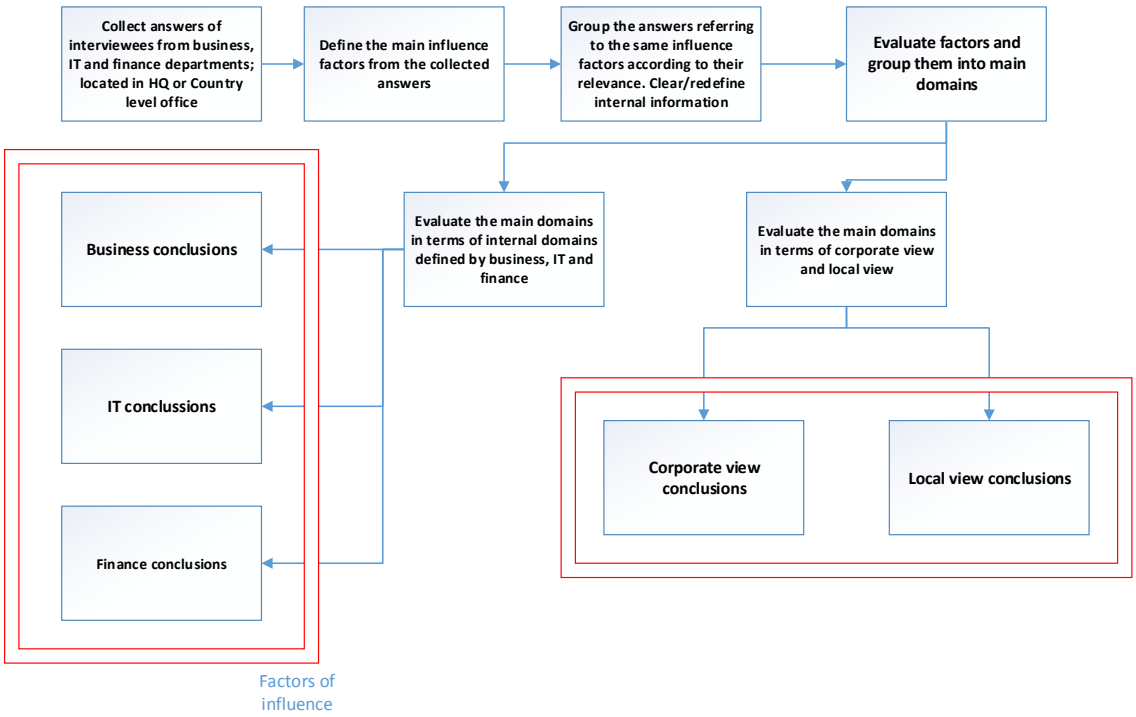


Figure 5 Research strategy

3.3 Data collection

The data gathering process has been done by conducting interviews with different people in a global company. The opinions and their understanding of MDM have been evaluated according to the literature that has been explained in the previous parts. The questionnaire was conducted in a form of a discussion in order to provide more opinions and comments in the matter from different angles of the companies. The list of questions used, resides at the appendix of the research. The interview process has taken place in 5 weeks and it has included people from different positions and expertise in the company. The fields of expertise which the interviewees were selected have been chosen from finance, business and IT domains. One of the aims of the interviews has been also to check the current state of data and how it is being perceived in the organization, and whether its importance is seen with priority or not. Each interview has been done either by meeting in person or by phone (on a country level) for duration of 40 to 60 min. In this qualitative research, the interviews had a flexible structure and open nature, as related to Yin (2010): "*the researcher will have a mental framework of study questions, but the specifically verbalized questions as posed to any given participant will differ according to the context and setting of the interview*". Considerations and further analyses have been seen broadly from the business intelligence point of view because of its importance in dealing with data from finance, business and IT.

3.4 Informants

The informants were chosen to be from three big domains of influence in the company on a corporate and country level, which are business, finance and IT. Below we give a summary of the characteristics and roles of the people that are influenced by master data, more precisely their departments. Due to ethical reasons the names of the interviewees are not written. The participants were chosen to have many years of experience within the company because the information needed was aimed also to the past of company and their past approaches towards data, master data, different projects, etc. On the business domain there have been selected 5 people with broad knowledge about the organization and current challenges. On the IT there have been 6 interviewees that have taken part in different projects in the organization mostly in global projects. Last, there were 10 people interviewed from finance department including vice president of finance and vice president of commercial domain. The increased number of informants in this domain results as a mixture of finance and business intelligence consultants, whom have been dealing with data for quite a long time and they have been eager even before to find some solution to the issues generated by data retrieved by different levels. As it can be seen from table below, some interviewee are involved are working in more than one domain.

Table 2 Informants from Finance, IT and Business domain

Nr.	Role	Domain	Global or local rep. & experience
1	Business controller	Finance	Global
2	Business Intelligence Consultant	Finance, BI	Global
3	Vice president finance, commercial	Finance	Global
4	Vice president, group finance	Finance	Global
5	Business Intelligence Consultant	BI, Finance	Global
6	BI developer	BI, Finance	Global
7	Finance manager	Finance, Business	Local
8	Finance controller	Finance	Global
9	Business controller	Finance, Business	Local
10	Finance controller	Finance	Local
11	IT Lead architect	IT	Global
12	IT process infrastructure	IT	Global + Local
13	IT solution consultant	IT	Global
14	IT architecture	IT	Global
15	IT solution design	IT	Global
16	Data management	IT, Finance	Global
17	Business consultant	Business	Global
18	Business program manager	Business, Finance	Global
19	Program manager	Business	Local
20	Program manager	Business	Local
21	Business support	Business	Global

Another important fact about the people interviewed is their location; that is, some are interviewed face to face and some by phone. Classifying the location of the employee in '*Local'* and '*Global'* has helped the researcher to gather diversified comments and views. This kind of categorization has helped us to answer the second question. The different views in terms of MDM observed from local and global perspective provided ground for the key findings and their evaluation.

3.5 Data analyses and coding

The qualitative methodology in this research uses two levels of coding in order to ensure accuracy and consistency of the analysis. Each of the levels has been explained in in the following chapter. On the other hand the analysis has been performed in alignment with literature explained, experience of the researcher in global enterprise and the current answers of the participants.

The first level of coding has been used to label the different raw data gathered and create the categories of interest relevant to the research questions. The labels discovered on this part will be referred to as key findings as they are the main source of data for answering the main questions.

On the second level of coding, is applied the concept of grouping the main labels into three main categories affecting MDM. After the second level grouping has been applied, some additional information will be provided regarding their relation.

By knowing the main categories, the thesis will examine how they relate to country level offices and corporate. This will be done by reviewing and grouping the answers by the location of the participant interviewed, whether on corporate or in some other branch office. The aim of this step is to examine the categories and answer the second question.

3.6 Ethical considerations and trustworthiness of the research

In the case of qualitative research, bringing a sense of ethics is has its importance because it involves close analyses and interaction with human (Yin 2010). Potential risks have to be assessed in order to preserve confidentiality, protect interviewees or other material usage (Yin 2010; Patton 2002). Given this subject of study the risks are generally high as information to be evaluated is an internal success factor of the enterprise and how this one has become very big and important in the global market. Because of the nature of the questions asked, the information collected gathered information involving different areas, departments and confidential material. Moreover, the information gathered also includes different projects that the company is focusing on or the overall vision. Because of what is explained above the evaluation has been processed with immense care in order to have credibility and quality integrated.

The data has been analyzed in detail and conclusions are made by the researcher by no own objective and highly subjective in nature. Furthermore the conclusions are neutral.

4 RESULTS

On this chapter, the most important key findings will be pointed out and discussed, along with some important and interesting comments by the interviewees. These factors have been analyzed according to their relevance to the first research question of this thesis.

4.1 Primary level coding: The affecting factors

4.1.1 Data quality

The first understanding from the answers is referred to quality. Although the need of manual intervention on the data coming from systems is common, there is a different approach by the different interviewees and there seem to be a connection between the participants belonging to the same departments.

However, there is a common understanding that data quality is important for all of the departments and its need for quality will increase in future. The quality of data is being seen in two different sub-dimensions related to the country level and corporate level. From the interviewees it resulted that the quantity of detail in a country level is higher than on a corporate; therefore the importance of data quality on individual countries is higher. Another reason is that on a country level there is one or just a few systems utilized, while on a corporate the data retrieved is from information systems that are different from each other. On a global perspective the amount of manual intervention and correction is higher than on country level. This has been experienced also on the reporting team in corporate, and from the answers of the people interviewed on country and global level resulted that there is an increase in importance of data quality (even more on corporate). As explained by the remark pointed out:

"We need to make new business volume reports every month. Local offices need to deliver the data manually and there could be mistakes like margin, or dealers, etc. because the process is not automated" – replied one of the employees from reporting team, claiming that there are some main processes that need manual intervention. Furthermore, regarding reporting, he emphasized that there are different reports that need to be done. Some are automatic and they are referred to static reports, while others are on-demand or at different times. Different levels of the global corporate have differences of data, and collecting them and reporting from a corporate perspective is not an easy task. It means that data is transferred to different environments till it reaches corporate level and therefore they need to be evaluated, also discussed by a business controller: "*you*

cannot say to your customer that you don't have the data required and he/she has to wait; this cannot be affordable for a successful global enterprise".

There is also a connection between the countries itself, that is sometime they are dependent (seen from corporate) in terms of delivering data. One interesting key finding related to data is on a corporate the speed of delivery of data is even more important than the data quality itself. The manual intervention on the other hand plays also an important role on the data transmission and visualization in the company on a global level. Manual intervention is causing the financial analyses or other core business functions to be slower because time is needed to cleanse and align data centrally. The quality of data is dependent also from the not standardized input in the front office systems; this was mentioned by most of the interviewees with IT background, but also others who have many years in the organization.

An impact of low data quality is related directly to customer relation and external information exchange: "*Another thing is if you really want to present your data to our customer to an API or portal you need to be damn sure that your data are correct, because if you show incorrect data guess what happens on twitter, guess what happens on social media, so the reputation goes down; that comes with digital and suddenly you are on the news and they try to sew you whatever. So, control of your process is crucial before you go outside. So I think this is a big reason why we need to start thinking about MDM so that we can facilitate these ideas that we are having in the coming years*". The remark explains the view of one the managers that is directly connected to the quality of data and external delivery of data.

4.1.2 The impact of data quality on decision making

Regarding literature, this second key finding of this research is a little controversy the literature studied before. Due to the manual intervention by the teams involved towards the transferred data, decision making is not seen to have a big effect from data. Some of the people interviewed think that data quality does not have a significant importance on decision making process as highlighted: "*Well, I think that good data supports good decision-making but I am not sure how senior leaders decide, I hope they do it on data. If so, I hope they do it on good data*". Others mostly replied that data quality doesn't impact and experience is most important. However, most of the interviewees have their understanding that decisions are made on data retrieved and even thought data might not be perfect it still creates an overview of what is going on in the company.

The importance of data quality in decision making process however is seen more important on corporate. Decisions on a country are done mostly by country managers who

have many years of experience in the current market, while decisions on corporate affect many other offices and therefore the need of good data is crucial.

Although the interviewees mostly replied that experience is the driver of decision-making, the IT domain was stated that the time to make decisions should be fast and gathering data requires sometime for retrieval which implies that data is important. Data quality impacts decision-making when it is needed to check different countries or regions in term of profitability or other financial investments. From IT domain, the interviewees were more concerned about the connection between data quality and decision-making.

4.1.3 Previous projects related to master data or a single source of truth.

One of the questions that discovered many insights and previous experience in MDM was the one connected to the success or failure stories of projects in the organization and their connection to master data. The idea of 'a single source of truth' sometime was vague and understood in different ways. IT domain was more involved in previous projects related to MDM as before this was seen more from a technological angle. Different systems were mentioned such as CRM, or ERP, and different stories. One of the interviewees explains that CRM is not being used because of the wrong choice in selecting the system in the past, therefore leading to no value. The functionality, on the other hand, was not seen as optimal because the implementation is perceived not to fit business. A remark from one of the employees states it as a big investment failure as follows: "*it failed because it is connected to the source, it is connected to most of our front office and back office systems and it does not hold a very good registration of basic data like parties (dealers). This because the business side is not considered properly*".

Managing efficiently data and master data seems not to be a new issue for global organizations. For instance, one of the business managers remarked that there has been a project before that was meant to centralize the systems and way of working of all the countries. However, the project resulted costly and the countries refused to support this initiative. One of the participants claims that the project's key failure was that it was not explained what a centralized solution could benefit to the country level. There are also different stories of big projects that started with big investments and they affected master data or tried to create some parts of it. There have been mentioned several reasons for previous project failures. The key reasons of failures discovered by this research will be explained below briefly:

- The projects related to data have been seen within reach of technological teams where business side was slightly involved. As mentioned by one of the busi-

ness managers, "*It was seen as an IT solution because data was seen as an asset of IT*".

- Aligning the implementation and functioning of the new systems with the business and not vice versa. "*I think the implementation, and highly customization of the ERP system was one of the big mistakes. Everybody knows that if you buy an ERP system you should use it as it is, you should adjust your processes to the system and not the other way around*".
- There was a tendency to cover all different scenarios and catch them and put them into one systems and standardize that .The scenarios were approached from IT and it was tried to customize the system to the business, resulting in a rigid and costly system; not only in terms of implementation but also maintenance and even running it.
- Another key point, is the different changes that occur internally and externally as explained by one of the interviewees from architecture side: "*We start a lot of projects. Things change after the project starts, change compliance, change strategy. They created a pretty static box with data that it is hard to integrate with, it is like a push-subscribe methodology real time service. The project is a very difficult project as we are trying on a global scale there are a lot of politics and things to discuss with all kinds of people before it is done*".

4.1.4 Internal perception about MDM.

MDM is a vague concept and it is perceived differently inside the organization by the employees. There are different definitions as explained in the previous chapters in the literature review about the understanding of master data. The case company has in its structure different systems (front office and back office) and therefore MDM becomes difficult as the benefits and pathways are not clear. Another element of why master data is perceived differently resides on the fact that the global enterprises are made up from several functional domains; therefore master data in these areas is referred to the locating domain. So defining which data is the master data is not an easy task. From the answers it was clear that connecting these master data is a big challenge, as it is seen differently. For instance, the same key business term components could be used with a different meaning in countries and corporate departments. That is, "risk" can have a different definition in some countries, in customer domain, regulatory control departments, IT, etc. This kind of problem is already identified and some solutions are taking measures towards it, mostly on IT.

Connecting master data is referred differently, however one of the most interesting remarks from a few that were more involved in this topic is: "*The trick is to find out*

how all the data will flow between those and connect them. And that it is of next importance if you set up the data structures like asset structure customer structure, how do you connect them and where do you connect them? That's a difficult task. We have new masters connecting to old structures, which is very complex. In the bottom line it is hard work IT, it is really translating and mapping, you have to go throw that. Sometime from business it seems easy. We always say it is not the sexiest IT it is"

IT domain participant gives a very close perception to the literature review discussed and he analyses also reference data, meta-data and master data. The differences in data have already involved some key employees to start thinking about this topic and how it is related to the future of the company, therefore their understanding is broader.

For the people interviewed from business there is no clear understanding of MDM as it is seen more on technological issue. However, the persons residing in this domain embrace positively the idea of having one system in place with core business data, and especially having clarified the core business definitions. From finance perspective, as it deals quite much with data, it is important to be addressed before it becomes a risk. It can be seen from the exclamations made that the importance of MDM is more visible in the departments that are starting to deal with it. In long term it is perceived as important to have MDM in place as it will resolve many challenges. However sometimes people are concerned that a MDM project might also fail like previous projects, and the vision is not fully understood. "*I see MDM as a kind of building, you start with the ground work, start with the basement, so excel is good to start with but it is not the foundation; you get experience and in an agile world it works, but you need to turn it in a ground work, a structure. If you start with the ground work and you link everything to the ground work then I think in the future we will have a more solid basis for future reporting and add value out of our data. We have a lot of data, but you can only create value if you know for who you want to give which insight to which part of the data*".

On a local perspective a single global source of truth is seen more in terms of standardization. That is, it has a negative first idea impression. This happens because the local managers value a lot the country flexibility as a main key in creating revenue for the organization. This is true for most of the people interviewed, the commercial nature of the organization makes countries and their employees and even their systems very flexible to be differentiated among competitors.

4.1.5 Local flexibility versus global standardization

Being international is not an easy task as there are many things to be controlled. Therefore one of the domains to be explained is that countries tend to be flexible in order to generate their revenues while on a corporate level there is a tendency towards standardization because of several factors.

The flexibility is mainly on the countries itself and of course this is because the organization has an entrepreneur culture. However this approach has sometimes conflicts with the process-oriented company, which wants to rationalize each step. The flexibility is not only on the processes but also it has a psychological nature that defines the people working for the company as commented by an interviewee: "*The majority of the people has still the mentality, has still that feeling of commercial entrepreneurship attitude so this changing behavior is very difficult for them. It is not easy to educate them. It is a behavioral change not a technological solution*". The research found that there was a project whose intention was to provide a single view to all the countries but it failed. Local flexibility is seen also as part of the success of the organization as mentioned by one finance controller: "*It is a good thing that we are flexible, if you are too much into procedures it takes a lot of time and nobody likes it. Flexibility is an advantage but on the other hand we don't have any control if someone is selling stuff like and the margin is too low, for someone it doesn't matter but if people keep doing that it will have a very big impact on profitability. Some things need to be standardized but some flexibility should remain in place*".

On country perspective, flexibility is even more important than on corporate as claimed by the persons. Furthermore the effect of standardization is seen as a threat from the countries. There are different components that influence such as acquisitions, country culture, different systems, different system implementation, etc. Seen from the business perspective, countries are also seen as flexible in terms of data or contracts, due to the pragmatic nature of the company; meaning that it is driven by opportunity and this is one the main strength. Nevertheless, from an IT perspective this is also considered at the same time a weakness as explained below: "*a weakness because getting the more structural improvements and getting things organized that are not directly contributing to the business results it is difficult in this company. Data governance for instance is very important to organize, but in a company like this one is difficult because the added value is not directly seen, and people think it is a cost and we don't like costs. We are very pragmatic company, not theoretical or academically*".

Centralization is more seen from corporate, and it is generally thought that centralizing the processes would make the country to lose the details in terms of data that are needed. There were quite different opinions for this topic such as: "*We say that we are a global company but sometime we act very local, is that it is very hard to come up with a*

standards definition or certain attributes, and naming convention because you can have a commission also known as a bonus also known as a broker fee, everybody calls it differently".

Another topic that impacts this topic is regulatory and compliance, which is mentioned by almost everyone interviewed. Reporting is mainly focused on the corporate and it is essential to manage the information to generate reports that are needed for regulatory. To have different information is needed to go to each of the country that the company resides in and gather information that is missing or not mapped correctly on the global systems. This is not an easy task as each system has its own sets of data, definitions, fields, etc. Sometime the systems are just adapted to the local (country) and therefore some information required might be not possible, or it might require too much time. High quality reports on the other end require high quality data. On a country office, data is handled more easily than corporate because of the common system, definitions, reports, quality, etc. This has been emphasized also from one of the interviewees that have experienced working for both local and global environments: "*You have to manage different expectations, different people, different countries, data quality management issues, information issues, people issues but you have to handle that, but in my country we had everything under control. Here I already saw a lot of countries that say you are not going to have information from them because they simply don't have it* " – moreover he explains on flexibility that – "*I think it would not affect it at all, it is just more work by the countries to be done. You have to see the benefits and sell it to every country because it is important*".

4.1.6 The current challenges related to MDM.

The challenges that different departments are facing are mostly related to combined reports. These kinds of reports usually are created for investigating the data retrieved (dashboards), controlling of business main functions centrally, and referencing to the same data. Some more insights about these challenges are described below:

- The first issue related to MDM that almost every informant stated was about the speed of delivery resulting in latency in reporting. Of course different candidates mentioned different levels of reporting but they were confident that reporting on a global perspective should be faster. The latency is due to the non-automatic way of retrieving data with no master data in place. Different data with different formats and different fields, so generally due to the difference in legacy systems the procedure of gathering and standardizing in a centralized way the information becomes a long process, in terms of reporting.

- The second issue is referred to as ‘manual intervention time’. That is, the operations required on retrieved data. The delivered data from the systems in place have different definitions due to the different regulations, country, implementation, or even systems. However this kind manipulation is done and not all the departments see the business costs associated with it. Having a difference in definitions creates some confusion about simple core questions such as “*who is our customer*?” or “*what are our local agreements with one specified customer?*” Different kind of reports require different kinds of data and these last ones are not always in the same place as explained from the bellows reply: “*It is costing a lot of money, as hidden costs, because all our people are constantly taking data in order to be able to report to their dealer, or other stakeholders, whereas if it would have been in a ‘push up button’, your work is not about data gathering it is about data analyses and reporting on it*”.
- Third, the different systems in place, duplicates of inconsistencies, are part of creating the issues. The old systems are different in different countries and it has not always been possible to integrate them due to cost, time, culture, country rules and even desire. Generally they are referred to as front office systems and back office systems. The information goes from front office towards the back office and there are some manipulations in between that make changes to the data. These kind systems, called ‘legacy systems’ are present due to different acquisitions and they are generally referred to as not flexible systems. Even though old systems are seen as the main cause for creating not relevant and ‘need to be checked’ outputs, they are still quite crucial and changing these systems to new ones require a huge investment. This is also stated very simply from one of the finance interviewees “*The best way was to start over again with one global system and one front office system, it is too complicated*”. The knowledge of these legacy systems has been evident on each employee, furthermore the idea to change them all to a new systems seem as utopia due to the complexity but also front office flexibility. The centralization idea is explained neatly by one interviewee: “*Sometime these rules are hard and costly to bring that altogether in one central environment, which requires a lot of money and a lot of time, and people are not willing to spend that money on that particular area; they rather spend that money on selling things. So there is always the balance between cost and profits*”.
- The fourth issue is about going externally with internal data. Incorrect data has severe impacts and it is seen as a big issue. For example if some contract information would be exchanged, and dealer A would see contracts or assets of dealer B on a global level this would be problematic. This was a big concern of most of the people and even more participants from the business part. External

reporting is providing internal data to another party in order for this last one to provide added value to the company. Generally in a digital environment external reporting can be seen in some tiers. External reporting for regulatory – this is the data that is needed to provide to government or different authorities in order to be compliant and keep the license to do business. This can be seen on a corporate as well as on the country level. This kind of report is dependent on the international rules and laws as well as the national one. External reporting is mostly seen into:

- External reporting for partners – the data that the partner companies require in order to continue their partnership with the organization. The quality of this data influences directly the relation with the partner. In terms of digitalization this is supposed to be done with no manual intervention as this kind of data should be defined.
- External reporting for customer – *who is our customer*? The external data that is needed to populate the different apps or portals with information about the current contracts, loans, lessees, assets, etc., that the customer is involved in some transaction. These kind of external data are directly connected to the customer and they are the best link to the company. In global organization providing this kind of data sometimes becomes difficult as it should be done separately for each country as there are different systems in use and the data standards are different. If there is no standardization in place this cannot be achieved automatically.

4.1.7 Internal Culture

The culture of the company is an internal 'strong' circumstance that can either impede or support long term initiatives such as MDM. In global companies, "*if they are used to long term successes it becomes easier to support it, but if the history does not include many success stories, then MDM becomes very difficult, making it troublesome to find some senior executive to take ownership*".

- The mindset of the company is an interesting point to ask as it reveals that the company has generally mid-term mindset-planning and the ROI should be visible quite soon in order to continue sponsoring the project. As said from half of the people interviewed: "*we are a very pragmatic company, driven by opportunity, that is one of its strength, but at the same time a bit of a weakness because getting the more structural improvements and getting things organized that are not directly contributing to the business results it is difficult in this*

company. In a company like this one is difficult because the added value is not directly seen, and people think it is a cost and we don't like costs".

- On the other hand "*When some issues become big problems, than there is a mobilization of managers. So they rather have first issues and then act, than anticipate on something that they don't see happening***"** – so generally the company has an approach to resolve the problems rather than anticipate them. The main reason behind is that in global organizations these kind of global investments are quite costly and they require several resources from many countries, "*we cannot invest in something that might or might not happen*".
- MDM is generally seen not as a current problem by high level management. All the people interviewed from IT they were aware of the importance of MDM more than other departments. The mentality is 'just do it' and 'we'll fix it'. Moreover there is an understanding that the dealer and the outside world is putting the bar higher and higher and faster and more reliable data is needed.
- "*We say that we are a global company but sometime we act very local*" - so the company is flexible on a country and somehow more centralized on corporate center, but still it tend to be flexible also on corporate as business should react fast while IT involves additional procedures and it takes more time. Another explanation is that global companies have developed in terms of flexibility and they are project-based, and therefore they are focused on short term results: "*We are a project-based organization, you need to deliver fast and we want results tomorrow*". This happens also from the previous history with projects that lasted long periods of time and they did not achieve the estimated objectives.

4.1.8 Different definitions inside the organization

There is a tendency that each segment of business uses their definitions. This results in different departments reporting independently with their non-standard definitions. This phenomenon is widely accepted among all interviewees. As an example was the question about the absence of a clear definitions of who is the selling party, or the customer, dealer, risk, etc. From different angles they mean different things or they are used in different context. On the IT part there have been some improvements in this area by creating some internal business glossaries mostly used for compliance and regulatory. The importance on the business part seems more significant on this topic as the company is seen more on a commercial way. Some kind of data definition board should be in place to define the used terms and their context. Definition usage is different on corporate, on country level and even on different departments inside the corporate. Mostly the

participants from finance are well aware of it as they are more involved in the different reporting styles.

From the people with many years of working with the company it seems that this is not a new problem, but there have been some initiatives that have started but they have never finished. What is experienced during the interviews, is also same terms but with different meanings as emphasized from the participant form finance: "*Think about portfolio, if you talk to finance like me, I would talk about portfolio which is a net book, value portfolio as per your balance sheet; when you talk to risk dep, they would talk about exposures which are the money that we should collect from the customers but they have not still paid us*".

So, different people see the same thing but in essence they mean something different on corporate. On country there are also different initiatives in terms of definitions that are being used, but they are not always aligned with corporate or other offices, therefore the definitions are mostly local (on a country level). The importance of standard definitions is seen of relatively high importance and is connected also to the old systems in place. Different systems have their impact because some terms or fields are used differently on the systems and at the end the selling party for a country is a dealer while for another is called '*an agent'*, and this creates confusion. A general understanding exists that someone from the big company domains, or some definition board, should own the data definitions that are used and update the list of terms.

4.1.9 Reasons why Mater Data Management was not developed before

Among the diverse influences in the past we found two that had the most influence of not having in place in the present a MDM initiative or framework.

- First it is recognized that there have been some projects before and they failed for different reasons, such as technological approach and complexity. Furthermore, they were considered as big projects and the investments in them were quite big while the results did not have a significant added value. The idea of having the same information in each country has been approved by most of the people but it does not seem very realistic. The participants who had a more key role also mentioned that this kind of initiative should have a clear start and end. Moreover, there is not a clear understanding of the benefits of this project and making a business case seem to be a challenge. On the other side there are different projects ongoing that have taken more priority, therefore senior managers need to prioritize and to deliver.
- Another important reason is that master data has not been seen as a problem before. Regulatory and compliance seem to have not a considerable impact and

flexibility on the front office has been seen as a key factor in the success of the company. However, the importance of master data has been increasing in the last years and there is an increase awareness of the importance of how MDM and creation would resolve some core challenges in different areas of the organization.

4.1.10 Perceived ability to have master data in place

Towards the readiness of having master data in place, there have been positive and optimistic answers from all the three main domains of the company involved. However, there is a big need of someone representing high level hierarchy to have a good understanding and push forward with the project. It was overall agreed that the awareness of master data has been increasing in the last years and it cannot be omitted anymore. From the people interviewed, the ones residing on a country had a simpler approach, while from corporate there is a much broader understanding of the issues that the company is facing. However, the benefits seem to be comprehended from both local and global representatives due to their day-to-day activity and experience. The people interviewed from a country level, had a tendency to protect their front offices, moreover they are used to them and they already know how to deal with issues. However, on corporate, the components to be evaluated are more, including also risk: "*If there is no sense of urgency, nothing happens because commercial priorities or compliance take priority. There are some big steps in master data in some places, but in other places not yet*"

The biggest issue in running a MDM project, as perceived, is evaluating the cost. The benefits of MDM plan are slow and they require big investment. As claimed by one of the interviewee from IT: "*We are a very pragmatic company, we want to see results tomorrow*". But there is also a general approach that people are talking about it more and it there is an increase in awareness: "*We are at the start, we are missing governance, ownership, I think the minds are turning but it's not there yet. The awareness is increasing*". All the people interviewed were pretty confident of the ability of the company to implement a MDM plan after reflecting to the main demands, past experience, human resources, and monetary power.

4.1.11 MDM is residing in technology or business domain

The question about whether MDM should reside more in IT or business domain was answered in a diverse way. There is also a common gap between business side and IT, and the participants are well aware of it due to previous projects that have been devel-

oped. A reply from one of the business controllers combined both teams in terms of master data, "*MDM should be seen as both IT and business. When you explain it in IT they don't understand. The gap is to translate between those people but they should be equally involved. Technical should come up with a good solutions that makes sense but also it is really important to understand what is going on with the business*". The company has already had some experience with projects residing in only one department, and it still has, and people are well aware of the importance of having both IT and business aligned. Although data is seen as technical, most of the people interviewed think that it should reside however on the business as IT works more as a facilitator: "*If the business doesn't scream for the data then there is no reason why we should do something about it right. However IT is accountable for supporting the business, so there is a big part in IT as well. But ultimately I think it should be a business responsibility*".

The main focus of the master data at the end is supposed to be business as stated by upper manager of business: "*I think MDM should not be addressed as a technical solution because if so it will not be able to create sufficient support levels in other parts of the businesses. So I would position it in the business infrastructure*". Inherently there is a clear understanding that the demands are on business and IT can help in resolving them, consequently it seems clear that if the solution will definitely fail if it resides only from one point of view.

4.2 Secondary level coding

On this phase of the research another coding layer has been applied to the labels, pattern coding. The result of pattern coding resulted in three meta-code themes ascribed to the eleven initial labels. The three derived categories are Data Properties, Influences and Sociological factors.

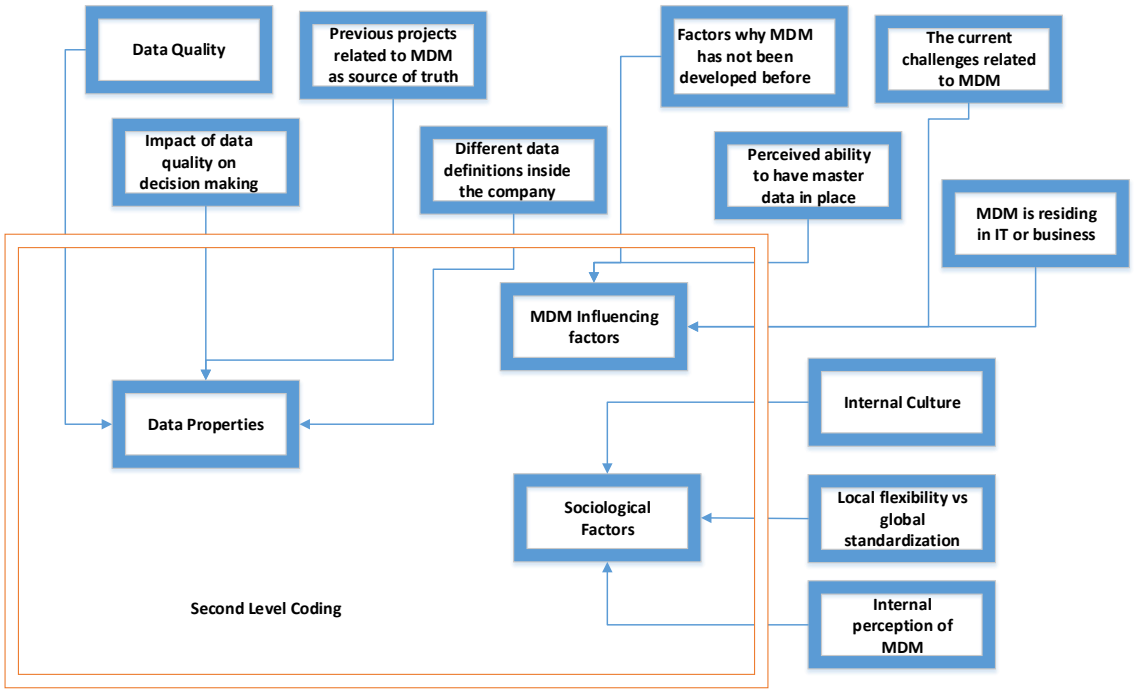


Figure 6 Second level coding

4.2.1 Data properties

The first theme, Data Properties, groups four of the first initial coding that are related to the data itself. As it can be seen from the picture the four labels enclosed to the first meta-code are Data Quality, Previous projects related to MDM as source of truth, Impact of data quality on Decision Making and Different definitions in the company.

The theme is aimed to define an understanding to the journey and ingredients of data towards MDM. Based on the answers of the informants, there is a clear link between the four chosen labels. There have been positive comments about the data quality and moreover every participant was well aware of the importance of the quality of data due to the different spread systems. Furthermore, there is a clear understanding that the speed of delivery has a significant importance. On different sectors of the company there have been various improvements in data, mostly for reliability and speed. The decision making process on the other hand, seem not to be dependent that much on data quality, however there is a clear tendency towards making the right decisions based on good data. There is also an understanding that having a single source of view would lead to worthwhile decisions. The nature of master data encompasses the internal perception of master data as a single source of truth from the main domains of the company, more specifically from the people residing on those domains and their understanding of the importance of master data. Due to the vague concept of master data the answers were different, however there is a common ground related to the link of some core data

in all departments; in simple words some of the data is used by all departments to fulfill work duties. The understanding is quite clear but the complexity in relationships of these data is what is perceived as difficult. Another important element included in this box is if master data is considered a technological solution or a business one. Definitions are the last entity of Data Properties, however they have a direct importance in master data appliance. The different definitions on the whole organization play an important role in everyday work. They create various confusions and they are not updated. The definition's importance is a key component of master data and it is directly linked to it. On the global enterprise it is important to have common definitions in place in order for departments to be aligned with themselves but also with other country offices.

4.2.2 MDM Influencing Factors

The next theme, Influencing Factors, is a connection between the parts that have a direct influence on master data realization in terms of impedance or push forward. The labels have been analyzed in detail and they are relevant with this schema as they present the current challenges that the organization is facing, the different projects that tried to create some ground for MDM, the perceived ability and importance to have it, and some influencing factors that have made it difficult to implement. The information gathered has been analyzed and put into a common meta-code because of the relations of the above elements and how they interact with each other over time. The challenges that are being faced in everyday work have been introduced in this theme because their importance is relevant. Their importance relies in the fact that departments perform their work differently. The different initiatives in the past have also an important role in the influences toward a master data solution. Their relevance is obvious from every interviewee in terms of failed costly projects have a negative impact on master data future projects, centralizing data on a specific degree creates better source of information however needs to be connected to the whole framework, technological solutions without business failures, and different projects going on in different segments of the company with no connection with each other. All the above themes connect and create the influence category.

4.2.3 Sociological Factors

The last theme on the picture is the sociological factors. This theme arose due to the sociological factors explained during the interviews and it includes the three themes of Culture, Local flexibility vs global standardization, and perceived master data internal-

ly. Each of the above labels originates from the psychological connection towards data. Every company has its own internal culture that not everyone is aware of but they adhere to it after some time working in the company. The culture has a link to the Sociological factors as it creates a view regarding the mindsets around the organization and how things are being done. Another important entity in the current box is the Local flexibility versus global standardization. Due to the commercial nature of the most global organizations there is a tendency in being flexible and standard at the same time. However due to the complexity of the global processes in place and the people involved, there is no clear balance of flexibility and standardization. Standardization seem important on corporate, but it does not mean that standardizing would add value to the organization as a whole. The perceived ability to have master data is considered on the box not as important as the previous two; however it helped the research to have a view on how company sees itself with the current resources and expertise.

4.3 The relation of the three main categories with each other

The three main categories cannot be seen as single not-related entities. Therefore the research has created the relations between the three categories with their importance. The relations are visualized as below:

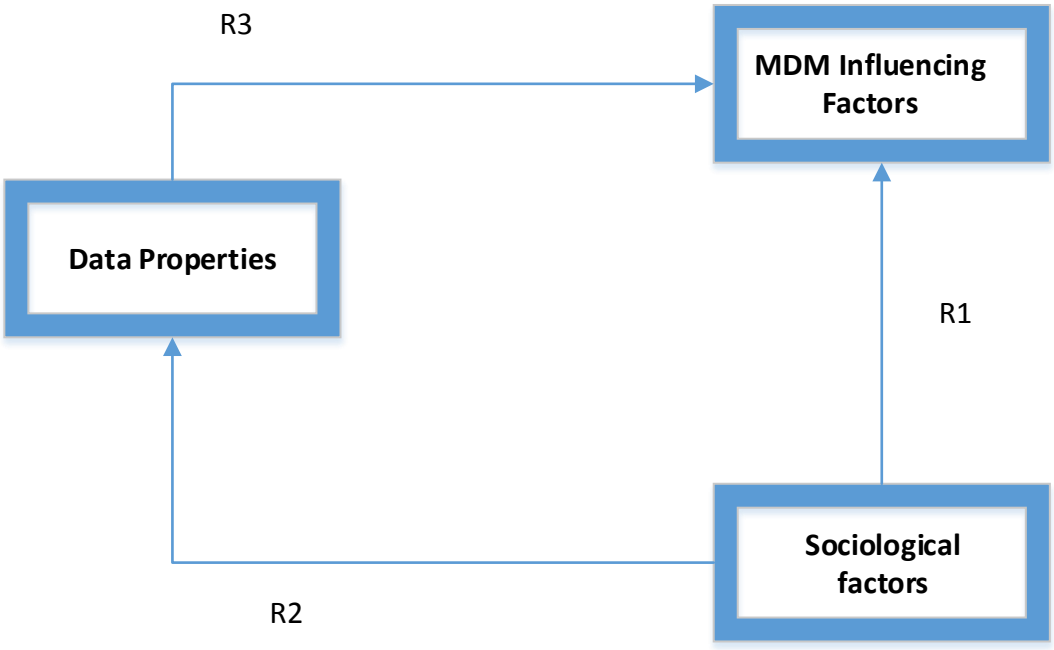


Figure 7 The main category dependencies

The arrows (R1, R2, R3) are added to show the connection between categories. The idea behind is that different themes specified under a box have some influence on the themes on another box. The direction of the arrows on the above figure is made in order to show the direction of influence among the categories itself. The sociological factors have a direct influence in both other boxes because of its psychological power affect. The mindset of the people involved in everyday processes affects the data quality maturity in 'Data Properties' mostly, and it has a big relevance on 'MDM Influencing Factors'. On the other hand the relation of 'Data Properties' with 'MDM Influencing Factors' is one directional because of the importance of the themes included in the first category. One might argue that there should be a bidirectional connection in this case, but since this study has been focused on MDM, its interest resides on this specified frame.

We analyzed the dynamics in the above categories in order to clarify even further how each of the key finding (themes) could influence the whole internal structure in relation with MDM.

4.3.1 Relation 1 : Sociological factors towards MDM Influencing factors (R1)

The composing key finding themes of the 'Sociological Factors' have some connection on the ones on 'MDM Influencing Factors' in either a positive or negative way. By expanding their relation it can be observed the internal connection that the themes have among each other (a1,b1,b2,c1,c2), as seen from the below figure:

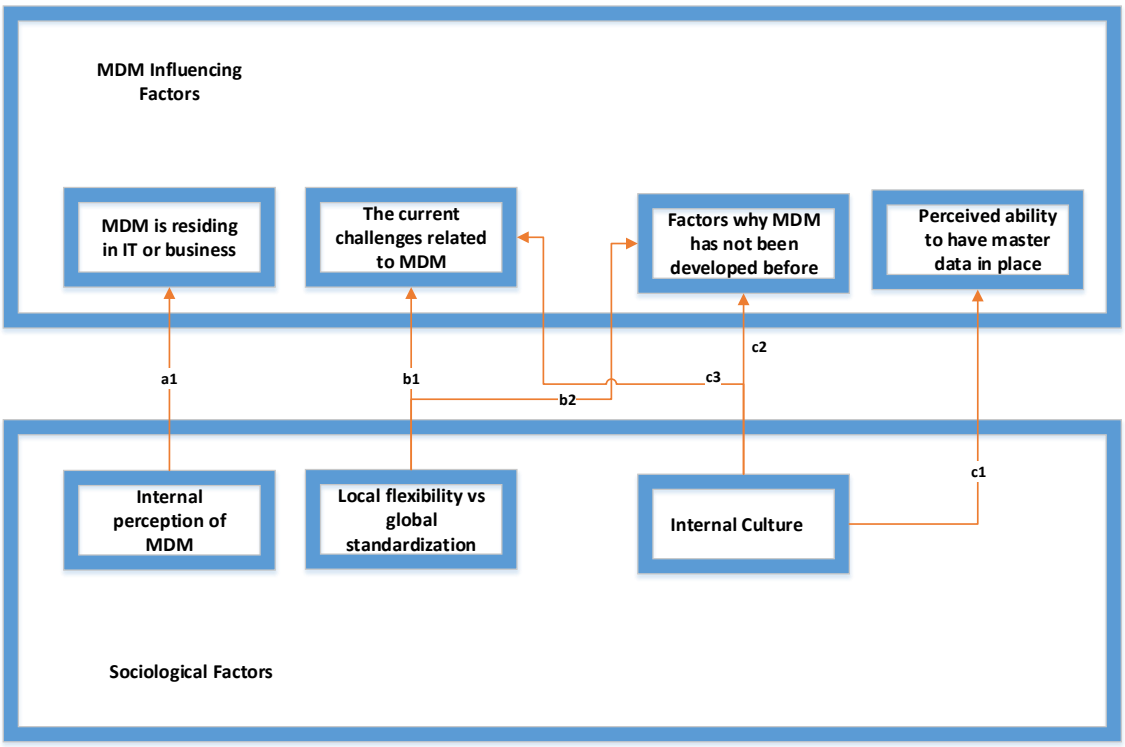


Figure 8 Detailed view - R1 relation

The internal perception of MDM from different angles and backgrounds as explained in section 4.1 prescribes how the nature of MDM is seen in the global environment (a1), furthermore where it resides. Different people affect the view on MDM and mostly it resides between business domain and IT one.

Local flexibility vs global standardization creates the relations b1 and b2 towards the aspects why MDM has not been done and the current challenges that the company is facing. The first connection (b1) is quite understandable, the local flexibility is a main driver why the company is successful, however corporate needs more standardization to better control; and it generates some of the challenges that the organization is facing, and it has been a main driver why MDM has not been done in the past.

The internal culture of the company from the sociological factors seems to have the most influence on the other box. It connects with 3 out of 4 themes of the 'MDM Influencing Factors'. The connections c1, c2 and c3 are a logical derivation of the influence of culture how the company has developed during its lifetime.

4.3.2 Relation 2 : Sociological factors apropos Data Properties (R2)

The second relation is created due to the importance of influence among the two boxes. This is the strongest connection among the others (R1, R3).

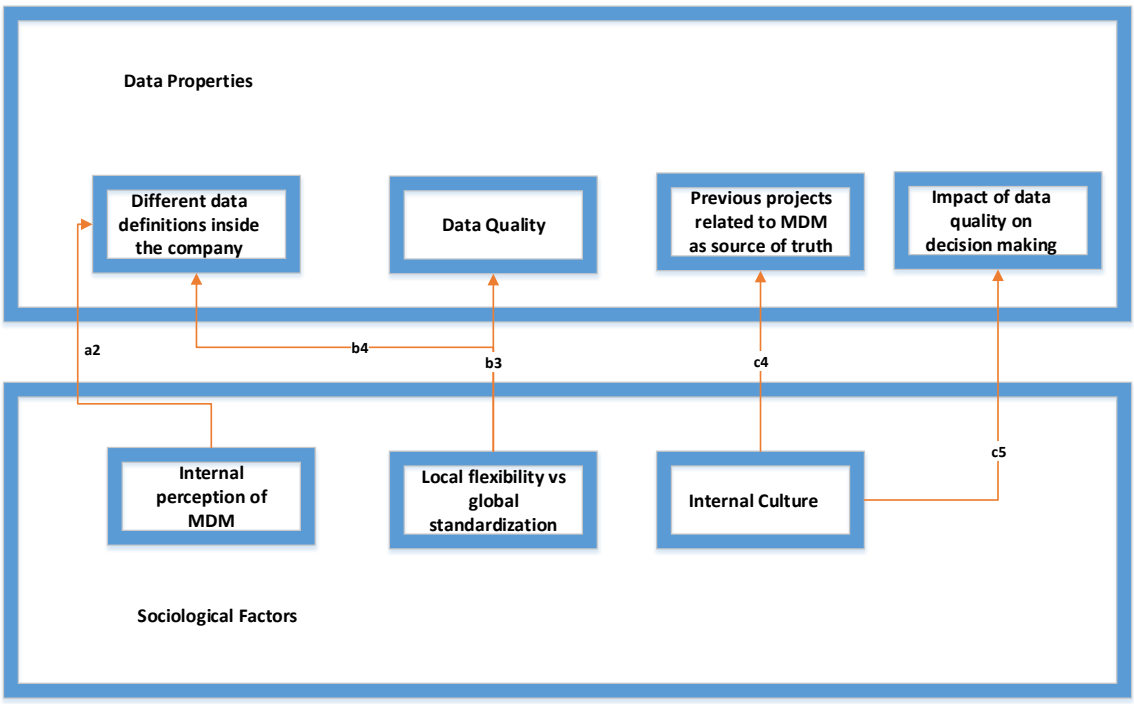


Figure 9 Detailed view - R2 relation

As it can be seen below the relation of the internal themes is very straight-forward in accordance to the discussed key findings. The internal perception links to the different definitions in place (a2).

Local flexibility affects data quality (b3) as the input of the systems in countries affect directly the quality received in corporate. The other connection, b4, is generated because it creates different definitions according to the front office systems, how they are integrated, their output format, etc.

Internal culture affects decision making (c5) as managers trust more their experience in the field rather than data. The last connection of internal culture is on previous project that have been done which had some partial improvement towards master data.

4.3.3 Relation3 : Data Properties to MDM Influence Factors (R3)

The last relation that we consider is R3 as it can be seen from the figure below. This relation shows how the data being produced influence the factors of MDM itself.

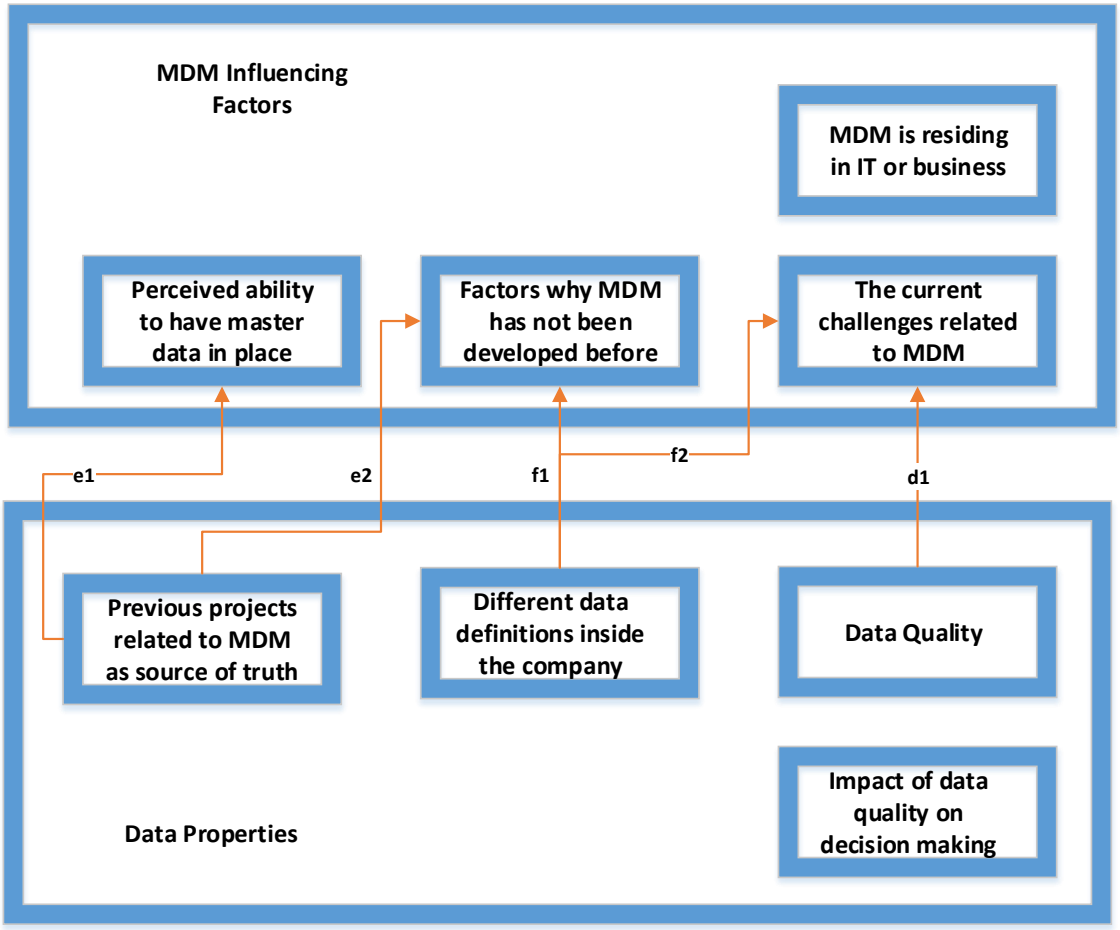


Figure 10 Detailed view - R3 relation

The internal connection of themes clarifies the connection by revealing the internal structure and the sub-connection among themes. Data quality has a link towards the current issues (d1) and this is understandable.

The previous projects that have been done related to MDM (or partially related to it) generate two connections (e1, e2). The first refers to the relying ability to have MDM in place. This relates to the development in silos inside the same organization and the projects that partially achieved what they were meant to. The second link refers to the reasons why MDM is not in place, meaning that failure or partially success of previous projects in terms of MDM creates doubts about this kind of initiative.

The last connections are related to the data definitions as why MDM has not been implemented before (f1), and the current challenges (f2). Of course, the difference in data definition is an issue, and the difference in definitions among departments, countries, internal domains, etc. is seen as a component that makes MDM more complex than it is.

4.4 Corporate and Country Level frame on the main categories

In this section of the study we will relate the main categories discovered with the corporate and country level views. The relations created are visualized as below:

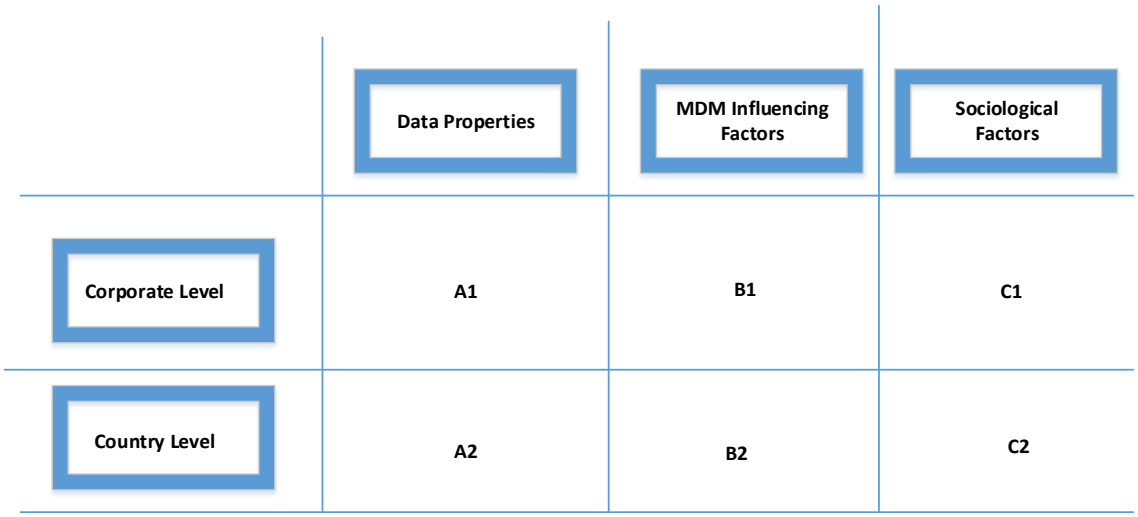


Figure 11 Global vs Local perspective towards the main categories

It has been assigned an abbreviation for each relation in order to compare the differences between the importance of the categories from a corporate (global) and country (local) perspective. Due to the same dimension of comparison each column is made up by two sub-dimensions (for instance A1 and A2).

4.4.1 Relation A : Data Properties

This relation on Data Properties category is divided into A1 and A2 sub-relations. A1 is related to corporate level, while A2 to country. This category is mostly focused on the internal challenges related to data. On corporate the data properties are seen differently than country due to the need of different information. For instance, the level to which local offices in different countries work is different than the one required on corporate; the level of detail is bigger on country.

The definitions used in corporate are generic definitions, while the ones used on country are specific.

Decision-making process is different in A1 and A2 because of the difference in the process itself. On a country the decisions are based on detailed data while on a corporate the decisions are more focused on experience and data gathered from countries. On corporate decisions are made from different points of view, such as regions, global, more than one country, etc.

The **past projects** related to MDM as a single source of truth has the same impact on A-relation from both perspectives. This is true because projects related to MDM tend to increase the quality of processes on both locally and globally. Therefore their alignment is important.

Data itself is transferred from the different systems towards corporate, and therefore the quality should be the same; however there are different layers of quality. This happens because A1 and A1 are different in terms of data quality due to the different influences that take place in between, such as manual intervention, wrong input, legacy systems processing, multiplier systems, etc.

In conclusion Data Properties dimension is seen differently from A1 and A2. In a country structure the definitions are different from corporate due to severalreasons such as country regulatory, system in place, people usage, etc. In correlation, decision making is also different in terms of data. Past projects related to MDM have different impacts on country and corporate. Seen from local view, MDM could be tried to be achieved locally but it cannot affect corporate center. On the other hand, past projects of MDM have more influence on countries. Data quality importance itself is considered important on both sides; however the detail in countries is much higher than corporate. The reason why the four mentioned themes have been included into this category, in terms of global organization, is that they represent some aspects related or influencing the properties of data.

4.4.2 Relation B : MDM Influencing Factors

B domain is composed of B1 and B2 concerning global and local level respectively. The domain is created to discover the differences related to the MDM factors analyzed.

MDM influencing elements have similarities as seen from the themes discussed before. However these factors have a bigger impact on corporate rather than country. This happens because of MDM importance on corporate is higher than country, especially a success or failure on corporate affects countries, but not to the same extent. By going deeper into this category it is observed that the influencing parts of MDM have different perception, and different impact.

The **factors why MDM has not been developed** before are similar in a sense that both B1 and B2 are linked together in this kind of project. However, the above elements on corporate are mostly related to cost, while on country office it is not seen as a big problem; as stated on the key findings, country offices have more control over their data than corporate.

The **ability to have in place master data** is perceived positively by both local and global views. That is, there is an increase of the understanding of the **current challeng-**

es that local and global are dealing with and how a MDM plan could resolve them and free the resources. Therefore the current challenges, although different, they reside on the primary roots of the work process. These issues are known by both levels and the improvements on them are mostly discussed on corporate and the way of operating is top-down; by issues is meant costly manual corrections of data, and not minor country problems.

The nature of MDM is seen similarly due to the maturity of the global company and the different challenges that it has had in the past. MDM is clearly perceived as a process that should have both **business and IT domains** involved. Finding the balance between the two requires efforts but because of previous experiences with projects in the past it is believed that although master data seems technical it should be under business in order to create value. However, there is a slight broader understanding on corporate due to the tendency towards standardization. The reason why these four themes have been included into this category is that they all are relevant as direct influences on MDM in global enterprise.

In conclusion, the second main category is perceived differently on B1 and B2. As explained above, mostly the difference resides in the level of importance of the MDM influencing factors.

4.4.3 Relation C : Sociological Factors

The C relation on sociological factors seems to be similar in both global and local perspective. In terms of internal culture there is a top-down influence from corporate. Of course there are some minor differences, but still C1 and C2 are much alike. This has been also perceived by the interviews done in the organization due to the discussed aspects. The Sociological Factors in terms of master data have their origination on country offices and they are transmitted to corporate. In other words, the front office systems generate the data and through the architecture used by the organization they are sent to further analyzes on corporate. The data transmitted and their format, traits, organizing, etc., transmit their sociological factor with them from country to corporate. By going further into the third category the research evaluates:

The **internal culture**, as part of this category is the same in a sense that both global and local dimensions try to achieve commercial opportunities. The difference is that corporate specifies the strategic level while the country offices go directly in the local market. The functionalities are different since global refers to global partners, while local makes business with local partners but under the global ‘umbrella’, however the culture of commerce is evident in both levels and that is the main cultural driver. This driver is seen as a main reason why the company is successful on the market.

The **flexibility and standardization** is different on C1 and C2. Country offices tend move towards flexibility while corporate on standardization. This has a connection also to the culture how the daily work has been done during the years. Countries are involved in different projects of standardization but still their attitude towards flexibility is higher. The importance of their flexibility is seen as a main element of success as stated in the following statement: "*the global level specifies that we are selling a car for example, however on country is added the color and whatever different special features towards it. And this adds value*".

The **internal perception** is same as it is seen more in relation to the current challenges that are addressed, either locally or globally.

In conclusion to this part, the sociological dependency is mostly similar on C1 and C2. Although the difference in flexibility and standardization, the way of working makes them similar. In addition to this, there is always a hidden balance agreement among flexibility and standardization, mostly in corporate, that is effective. This kind of agreement is understood as by both parties involved and the main priority is the customer.

5 DISCUSSION

5.1 The main factors influencing MDM in Business, Finance and IT domains in a Global enterprise

We have analyzed the affecting factors in a global company from three major domains (Business, Finance and IT) that are vital to MDM. These 11 factors have been explained according to the answers provided by the informants interviewed in the company on corporate as well as country level. The selection of interviewee from both levels has been decided in order to create more understanding on how the factors are seen from corporate and local level. The factors influencing MDM in global organizations are:

1. **Data quality** – the most common and logical key-factor that affects MDM, company, and decisions as well. Almost every person inside the company is aware of its importance and maturity level. The time spent on manual correction affects the three departments involved. IT and finance are more involved in data quality as they are the dealing with it on a daily basis. Business side is more concerned about the delivery speed because they use the data after it has been corrected. Reporting on data for the major domains is important, especially for finance because of its direct connection on reporting and most importantly because of the commercial nature of the organization. In accordance, the customer is affected by data quality. The customer is the main factor which keeps the business going on. This implies that the enterprise spends time analyzing and working with its customer, therefore the relations are based on data that is exchanges. The IT domain is responsible of ensuring 'how' the data are transmitted, while finance contributes in cleansing the issues generated either by the complexity of different systems, either by human input. At the end business side have the qualitative data in order to perform the related job activities. The above domain main issue is related to speed of delivery and correction. Business domain is directly connected to the end customer and their fast reply toward customer request is the most important concern, which is directly connected to the data quality. Therefore ensuring data quality at the source or increasing automation would have many benefits such as reduction of costs, better decision making, and improved analyses. Furthermore this is supported also by the theory provided in the literature part of this research and it is relevant to the discussed benefits of chapter 2.
2. **The impact of data quality on decision making** – participants are aware of the influence of quality of data on decision making in theory, however decisions seem to be made mostly in relations to experience and projects in place.

On the IT part, the information gathered reveals that there is a tendency to move to data decision-based methods. However, this approach is related to the way of working and hierarchy of the organization. Especially on this part, finance and business are skeptical in data and its correctness. Correct information however influences the levels of operational, tactical and strategical as explained from literature. However the converging of data towards the decision processseem not as important as the strategic decisions decided on a high level. In conclusion to this part, it results that data quality does not always have a big influence on decision making for corporate. There is a hidden influence of data quality, but is not perceived as crucial in decisions. The way how corporate works, commercial culture, and retrieved data seem to be preventing decisions made on data without additional checking. The legacy system plays a role in generating the data and the decisions affect also these systems. Data retrieved from for external parties, for instance, must be 100% correct in order for it not to run into organizational risks.

3. **Previous projects related to master data or a single source of truth** – has discovered different previous projects that had influence on how master data is seen in the company as a single source of truth. Some projects had partial success or even some failed to the designed function. IT domain has most of the time being involved in different projects to ensure reliability of the ongoing projects. This domain had learned different lessons in the past and its maturity in relation to MDM and its implementation has increased. A single view of business data is not a new concept of this domain. There have been many initiatives that tried to achieve or improve the challenges of master data. Many projects have been partially successful or some even failed leading to a big experience of the IT departments in this field, that is previous projects have been residing mostly in IT. This last one is experienced in projects and their connection to other domains of relevance. Finance and business domain on the other hand are also experienced due to the previous failures, but the aim has always been to improve their way of working and their inclusion on these projects has become crucial. Finance involvement in providing the right formats, quality, or definitions of data has increased. The past projects influence has lead also to business involvement. At the end of the day business side is the one where the projects are supposed to add value after all. In conclusion, finding the balance between the three domains (IT, business and finance) creates the scale of success of the projects.
4. **Internal perception about MDM** – the different opinions on how different people from different backgrounds see MDM. Generally it is understandable that MDM would resolve many issues, however there are different views on

it. Business domain has different ideas mostly related to its challenges or future digitalization of the enterprise. Basically MDM is seen of a technological nature. What is clear is that it will improve how business operates. IT domain is clear on MDM and there is improvement in the way it is addressed by this department. The perception of this domain is similar in the IT departments and some architectural schemas are already present. Finance have also its diverse perception of MDM. This makes sense because of the core financial nature of this kind data. Moreover, finance is also positive that the owner of master data should reside within finance department. Currently, there are not many literatures examining the owner of master data; however it is clearly understood that is should be in alignment with business and IT. This research increases a little the loop by putting also finance in between due to its connection to data retrieved. The importance of the internal perception is observed in terms of governance, which has been described in-depth in Chapter 2. Governance importance in MDM is related directly to the way how different people see MDM. On this part, the involvement of the three analyzed domains in having a clear understanding of MDM becomes important as it influence the governance of MDM, and governance is a rigid factor which if not done correctly makes the initiative fail quickly.

5. **Local flexibility vs global standardization** – the balance between the two is seen of primary importance and with high complexity. Flexibility resides in the commercial nature of the countries and their ability to conduct their business. Local standardization of local offices is mostly considered from corporate level. The concern resides in the way business is done. From business perspective finding the balance is essential as the company should not losethe connection of local needs. Centralization might decrease customer relationships. From business this is important and as explained in Chapter 4. Finance and IT are even more confident about standardization of the process of different countries. The complexity of this task is high; however the need of having the balance in place is increasing.
6. **The current challenges related to MDM** – the challenges that different departments have to deal in a daily basis because of not having a structured MDM approach. The most relevant challenges to all three domains are speed of deliver, manual intervention time, data generated from different systems, sending data to external parties. The challenges presented are consistent in global organizations and they are visible in all three examined domains. The first challenge is related to reporting and the need to have relevant data fast from the systems. The second is connected to the time spent on resources to modify, cleanse, check and submit of the data. The third relates to the incon-

sistencies created by delivering data. The last challenge refers to the digitalization and going external with the data, this is complicated and automating this process needs assurance of data relevance.

7. **Internal culture** – the way how things are being done also affects a MDM initiative. Internal culture is created from historic events and how the business has been dealing with different matters over the years. The influence of this factor is recognized mostly by business domain as they are more in contact with customers. However the importance of this factor is not of minor value to finance. This domain also has a big connection to the flexibility of doing business by country level offices because of the day-to-day checking toward data that is being submitted. IT domain is easier going related to culture because of the nature of the company (financial institution).
8. **Different definitions** – the difference in data definitions that are being used inside the organization. Finance and IT (especially finance) have a broader understanding of this finding than business due to the usage of different definitions by departments and systems. Finance deals with definitions discrepancies often and these definitions would be better addressed from this domain. Business is more easy-going on this, while IT is dependent on the finance definitions for the terms being used and ownership. The difference in definitions is mostly generated by the different legacy systems in place or different usage of definitions. Governance of these definitions also takes place in MDM concept. Governance is an ongoing process and it should address different definitions in place. Core business data might have different meanings to different people on different backgrounds. Having in place a governance body to take care of the list of terms and specify the meanings of terms used would benefit MDM especially from finance perspective.
9. **Past factors why MDM was not done before** – factors and projects that influence somehow negatively a MDM approach because of the not-defined business case and slow benefits. The two reasons for this factor are the failed projects in the past and management of master data not being an issue yet. The above two factors are the most important ones discovered for all the three domains examined. IT emphasizes that past projects that were related to data had a costly impact on the organization and therefore evaluating the cost-benefits of a MDM initiative would be hard to evaluate. This is considered also from finance and business domains and their history with the two reasons explained.
10. **Perceived ability to have master data in place** – how the people see the organization and its ability to have master data and how it would solve their issues. Finance and business domains have a positive perception toward im-

plementing a MDM initiative. That is their current challenges could be resolved if the initiative would be addressed properly. IT is a bit stricter because of the legacy systems in place and the complexity; it can facilitate the project but cannot take ownership. Furthermore, IT domain is concerned about costs taking place. In general having master data in place is perceived positively although its difficulties.

11. **MDM is residing in technology or business domain** – defining whether MDM is seen more on the IT side or business. Due to the previous experience of projects that have taken place in the organization, all the domains relate residence of MDM in business domain. IT is seen more as a support role to this process, while business should have a big involvement. The company has reached a high level of maturity toward addressing correctly the challenges towards business core data. IT is confident that the process should reside in business and finance and then be implemented from a technological point of view. This does also find theory in the governance part of literature. As stated, a MDM project should have business rules as a main driver and not technological one.

5.2 The main influencing factors on a country and corporate level

5.2.1 The three main categories discovered

The research has applied another level of coding to the primary key findings in order to concentrate the information into categories that are relevant in global enterprise. The main categories defined after the second coding are:

- **Data Properties** – results in a combination of Data Quality, Previous projects related to MDM as source of truth, Impact of data quality on Decision Making and Different definitions in the company. The main reason for this category is to evaluate the journey of data towards MDM. Data Properties has significant differences between local and global perspectives. This is created because of the difference in detail required on corporate and country. The data properties therefore are different and addressed differently. The influence of this category however is high on both country and corporate level due to its direct connection on data used within the organization. In a corporate center perspective this factor has also a connection with the local office. That is, data are retrieved from country level towards corporate. This category difference resides in defi-

nitions, systems, projects, and detail of data between corporate center and local office.

- **MDM Influencing Factors** – groups the themes such as, why company-wide MDM has not been initiated before, the current challenges, perceived ability to have a MDM plan, and whether MDM is perceived residing in business or IT. These themes have been grouped together because of their relevance in terms of impedance or push forward of MDM project. MDM Influencing Factors is composed of the observations of corporate and country level relations are different because of their difference in detail aggregation. The influencing factors can be referred to the internal experience regarding MDM such as past projects. This category may vary to different organizations; however its relevance remains due to the core themes that reside in it.
- **Sociological Factors** – includes Culture, Local flexibility vs global standardization, and perceived master data internally. Each of the above labels originates from the psychological connection towards data.Sociological Factors category, although there is a difference in local flexibility and global standardization approach, the relation is similar in terms of addressing the same entities. The sociological factor has been a very interesting discovery due to the influence it has on the other categories. Although it might be seen as less significant as the previous two ones, it is a differentiator in MDM project.

The relations between the main categories are discussed to show that key findings are not lonely entities but they have also influence between each other in terms of MDM as follows:

Sociological factors have a relation to MDM Influencing factors in accordance to their internal themes, especially the Internal Culture theme. Mainly the sociological category impacts both the other two because of its psychological characteristic. The next relation is Data Properties towards MDM Influencing Factors. In this case the factors that affect MDM in global enterprise have a link to the data itself. The explanation resides in the links generated from the internal themes included into Data Properties category; they have a direct effect towards the other category.

The reason of categorization of the main themes is to create more general categories that are relevant to different global organizations. In conclusion, Data Properties has a different impacton corporate and local office because of the difference in data quality, misalignment of definitions and previous project experiences. MDM Influencing Factors category is also seen differently. On the other hand, the third category has almost the same influence in MDM from both global and local angle.

5.2.2 The main categories and governance

In this part we describe how three discovered categories are dependent on governance of MDM by applying a governance frame as showed below:

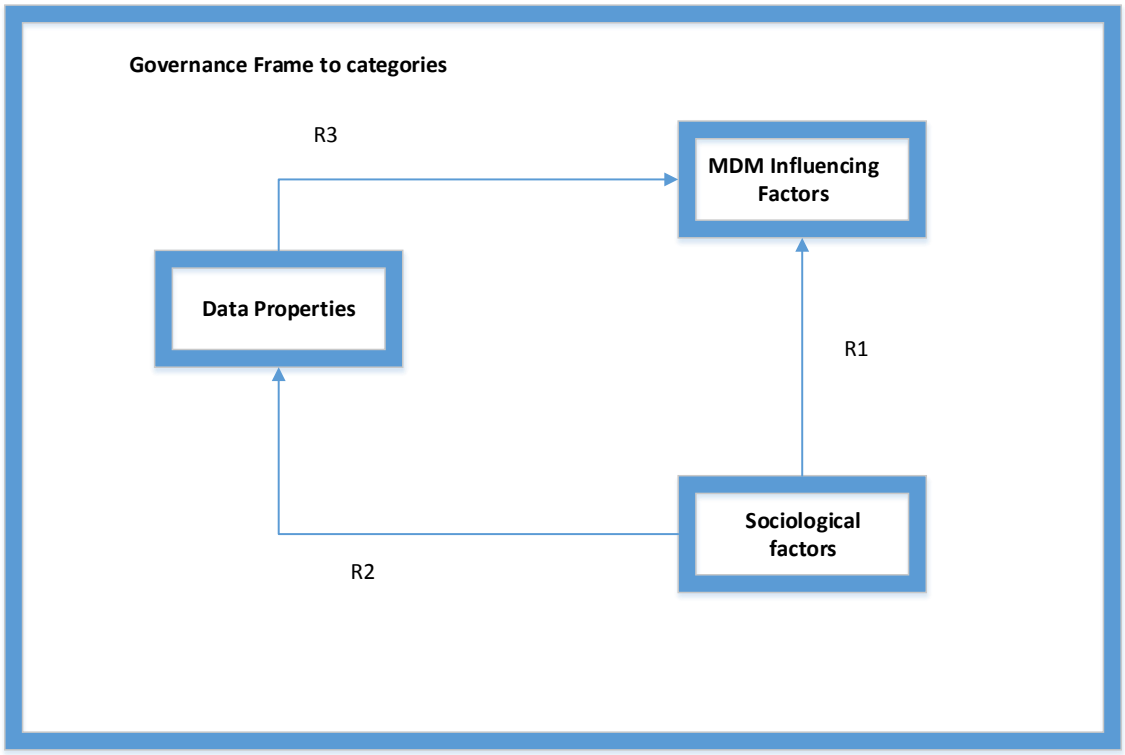


Figure 12 Governance frame

As shown in the literature part (chapter 2), **governance should be the one controlling the data properties explicitly**. It should mitigate complexity of MDM and validate the data being used by the global company. Within context, governance should satisfy all the correlation of data from different sources. The governance body integrates all the 4 residing themes in data properties category (data quality, previous projects related to MDM as source of truth, decision making, and different definitions) and it ensures that the agreed parameters are accomplished. By taking a more detailed approach, the governance body ensures that quality standards of the data are met both in country and corporate (however it should reside at corporate center). Previous projects had their own 'lessons learned' and governance collects and evaluates the documentation to prevent it happening again. Decision-making processes tend towards qualitative data. Last, governance creates and maintains common definitions in the company.

Governance and the MDM influencing factors (containing why large scale MDM is not initiated, current challenges, perceived ability to have MDM, and where MDM

resides). The factors influencing MDM are evaluated in the governance body by means of different employees residing both in business and technology. In addition, governance influence the MDM influencing factors by retrieving additional feedback on the different reasons why MDM has not been implemented, discuss how it can add value to the organization, and what are the current challenges that MDM resolves. Governance body acts as a director in coordinating business and IT to achieve common objectives.

Governance seem not to have a significant on sociological factors (internal culture, local flexibility vs global standardization, and perceived master data). The sociological factors seem to be immune by governance; moreover these factors seem to be the ones influencing governance. That is internal culture is a long process that the company has incorporated and it cannot be controlled by a governance body made up from the same culture background, moreover is this internal culture that has some influence on governance. The perceived ability to have MDM also resides within the organization, it connects different other relation to other themes discussed before and its governance is complex. Local flexibility and global standardization can somehow be controlled, it affects the way how the organization has been operating over the years. Strangely the Sociobiological factors as a category seem to be influencing governance to some extent. The factors explained before influence the specifications and decisions of governance because of its internal components. The below we summarize the discovery by adding governance theme:

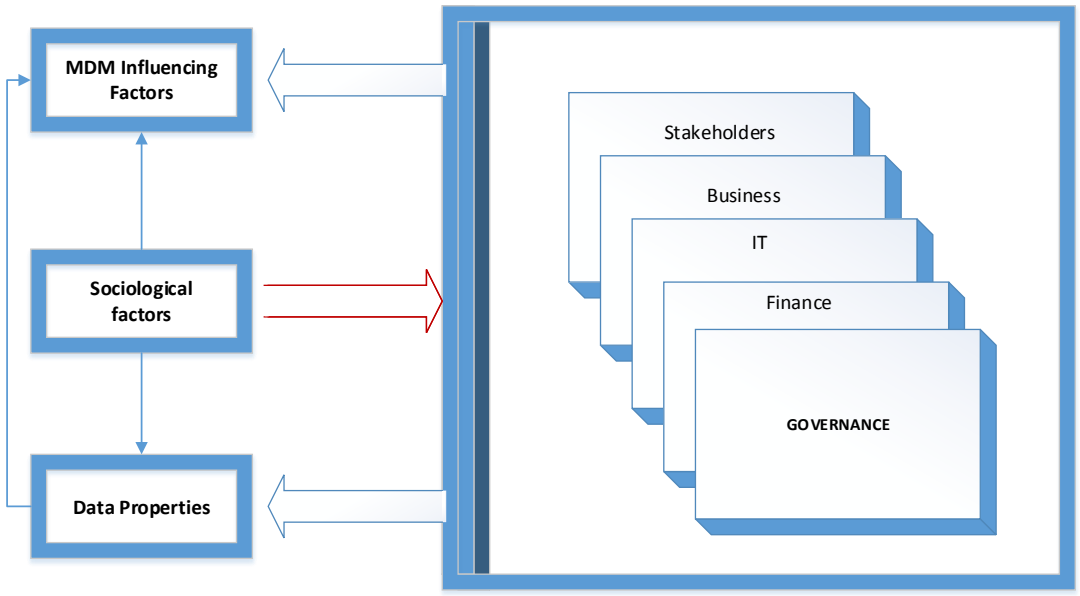


Figure 13 Governance and the main categories relation

5.2.3 The importance of the third category (Sociological Factors)

An interesting additional discovery of this study is the importance and how the sociological compound has its magnitude in almost every category and theme itself. From the analyses of the answers of the main questions of this research, it has been observed that the sociological factors have the most influence among others.

On the analyses conducted on the first question and its answers, it has observed that the Sociological category influence the two others in terms of MDM. The other categories influence seem not to be as significant towards Sociological one and each other. By going further into detail, the answers of the informants were grouped by the residing domain (business, finance, IT), and an interesting fact has been observed; **that sociological influence has a big influence among the categories due to its influence.**

The second analyses that supports this discovery is done on the second main question of this research (regarding global and local views of MDM). During the observation of the three categories in terms of global and local perspective, the only one that is seen similarly is the Sociological Factors category. The other two are viewed differently.

5.3 Theoretical implications

This study contributes to the literature on MDM by investigating the different factors that influence it in global enterprises. The literature discussed in the second chapter of this research explain different views on MDM in general, while this study puts a major focus on global environment. The research also provides additional insights of the perceived importance of MDM in these kinds of organizations by discussing several attributes. The employees interviewed in this study reveal different views on MDM depending on their residing department; this creates a broader view on the topic. The research provides also some of the distinctions of a global enterprise seen from two different points of view, which are global and local. That is, the research creates a link between the views and analyzes them in context of MDM.

This thesis adds additional value on the literatures by providing eleven key findings grouped into three main categories of influence in global companies. The factors explained in the previous chapters can act as reference for future studies of MDM. Each of them can itself act as a topic of future research in this field of study.

5.4 Practical implications

The results developed in this study can act as a reference for future implementations of MDM in global companies due to the similarities in nature. The key findings, on the other hand, can be seen as a comparison between future and current implementations of MDM. These key findings add more clarity in the complexity of this topic into global environments. The categorization conducted in this research can be evaluated even in different specific organizations. In addition, the three main categories discovered are relevant to global organization and therefore they can be a good starting point also for other different organization. These three main categories could be divided into specific other themes and be compared to the eleven ones discovered in this research in accordance with the benefits of MDM.

5.5 Limitations

The research is based on a 6 months internship in corporate center of a financial company; from which 1 month was spend in interviewing 21 people of different backgrounds. The focus of the first months was to get used to the challenges related to MDM and different solutions that the company is dealing with and its approach toward MDM for future implementation. One of the limitations of this research is that there is no governance in place for the current data flow; therefore different people have different approaches toward a global MDM framework. Some might argue that it is also part of the culture of the company of being not standardized and this is the reason why it is so successful in the market. Another important limitation is that documentation is not in place and sometime not clear, making processes complex and not structured, furthermore the meanings of same words but from different departments.

Limitation in literature, there are not many resources to utilize that connect MDM to global enterprises, financial ones. Evaluating the benefits is difficult at this point of time as MDM has not become a problem in the organization and the approach towards it is not clear.

The scope of MDM is big topic for global enterprises whose local flexibility is plays a direct role, therefore it is considered a big change inside the organizations and sometime the interviewees are a bit reserved and skeptical towards it. However there is a common understanding that needs to be done in some time in order to stay competitive on the market and not lose market position.

5.6 Personal opinions

After 6 months of researching, among the working hours spend on this thesis there are also some personal discoveries relating to the topic discussed.

5.6.1 Changing all systems into one global solution

"*Why not changing all the legacy systems to one powerful solution for all the countries?"* – was asked in one of the interviews. This approach theoretically looks good, it would resolve many challenges to change all the systems and have just a single one in place; but is it achievable? The answer is terms of global financial companies that have many systems seem to be "***No***".

It would require a huge investment with unknown results and probably a failure. Changing the systems to one is not difficult though, but implementing and standardizing all the connections it is another story even if the organization has proper documentation and global procedures. Local (country) offices have their systems adapted for the region it is working on, and complying with local and global regulations. Each of the systems in place has its own developments and it generates its own data for the corporate.

Seen from a data-driven perspective, the transactional data generated from different sources is different and reporting on it on a corporate view requires additional analyzation, filtering and enrichment. This is resource-consuming but important to do. On the other hand decision-making is dependent on this data and on a corporate perspective some small mistakes could lead to a strategic failure in a specific region. Currently these kind of data has been calculated manually and it has not presented any problem, but today with the current evolution of technology, market developments and big data approach, this is tending to become a problem in a close future.

The case company has approached an 'island' development strategy, meaning that they have developed different projects in silos (islands) and there is not a clear connection of the developments. This idea was not a problem on the last decades but with the standardization of the industry and as current literature is showing it will soon become a problem for old enterprises to survive the future. Master data in this sense could be referred to as the bridges connecting these islands and creating a holistic view from the headquarters. Managing the master and transactional data on the other hand becomes even easier when MDM framework is in place because the different system data would be similar and it would easily lead towards standardization.

5.6.2 A fool with a tool is still a fool

MDM is not just a solution such as a software provided by a different vendor. It is more a holistic view about the internal processes and how the organization is doing business. Even if the company has spent huge amounts of resources on the latest technology in MDM solutions, it does not mean that they have succeed in it.

The internal investigation on the data is more important than having a third party to do the work. The organization, because defining the data definitions, connections and master data should be set by the internal governance body or some other unit that has been assigned to this task. Today there are many companies that invest much in very expensive solutions that at the end do not represent what the business main activity is like or has not included all the main processes. Of course, the help of a third party that is specialized in this field is important, however defining and managing master data is more an internal function.

In terms of global enterprises, master data definition should be considered internal because of the different roles, positions, and different data streams relevance. The main idea is to create a single view inside the global organization of what the company is doing and what does the data mean. A simple question such as ‘who is the customer of the company?’, ‘what is the company selling and how?’, ‘who is the dealer?’can have different explanations from different persons inside the company either on corporate or country level. Data is becoming an asset and due to globalization without proper Master data in place global companies will struggle to survive even though they might be doing quite well at the moment.

6 SUMMARY

After analyzing MDM in the case company, this study has investigated the main factors that influence MDM in global enterprise, creating a 'big picture'. The aim was to provide extended answer to the questions asked in the beginning of the study:

1. **What are the main factors that influence MDM in business, finance and IT domains on global enterprise? How do these factors influence each other? How do they interact with governance?**
2. **What are the different perceptions of MDM on corporate level and country level?**

By means of literature involved in this research there are provided some of the most influencing elements affecting data and master data such as the different definitions, decision making, legacy systems, reporting, poor data management consequences, and current issues. By doing so, this study aimed to provide the grounding of theory towards MDM approach in global organizations.

The purpose of this research is to analyze the different components that affect MDM in global organizations. The research has been developed on a global financial organization where the master data concept is vague but its importance is easily visible. The reason of choosing this kind of company resides in the importance of domains influenced internally such as business, finance and IT. The three domains have their own approach on MDM because of the difference of their core data. Another interesting factor analyzed have been the different views on MDM, which are referred to as 'corporate' and 'country' view. The thesis is composed of five main chapters, each of them dealing with different aspects of MDM.

The first chapter has been divided into three sub-chapters to provide additional insights on the topic. It is a general look on the importance of this thesis in global organizations that data is becoming an important asset, and its connections. Next are presented the main questions to be answered and their relevance. Last it is presented the case company and its major operating domains, in terms of MDM; which are business, finance and IT.

The storyline continues by examining in more detail the aspects of MDM by providing additional literature on the topic and the nature of master data in global enterprises. The most important literature that has been considered is from author Loshin (2009) because of its relevance to organization. The literature is extended also with business intelligence data, poor data quality consequences and the benefits of having in place MDM. A big part of this chapter has been assigned to governance and the creation of MDM by providing the key factors analyzed by authors such as Fisher (2007), Loshin

(2009), Power & Hut (2016), Mohamed (2013), and other literature related to ERP and CRM.

The thesis is a qualitative research. The primary data has been collected by different employees. On the data collected was applied two levels of coding. The data collected has been categorized to eleven main factors of interest, which are explained in detail in chapter four. Then it is explained the second level coding and its parts are focused on the main categories resulting from the key findings and how they are related to these groups. The reason to implement a second level of coding is to generalize the results for other global enterprise. Another important differentiator is dividing the factors discovered to corporate and local level.

Conclusions are drawn in chapter five, discussion. The chapter is divided according to the questions of the research. Therefore its first chapter is conclusions, taking a straight-forward look to the answers and discoveries provided to the main questions. Next subchapters are related to the theoretical and practical implications, limitations of the thesis, and personal discoveries. Personal discoveries are some interesting observations related to global organizations and they have been seen with alignment to the topics discussed.

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8 APPENDIX A: QUESTIONNAIRE

1. What is your name and your current position in the company? How many years have you been working with the company?
2. What are the areas of expertise in the company? What are your responsibilities in the company?
3. What is the importance of data quality and a single version of truth and how does it influence decision making in your opinion?
4. What is your understanding of MDM and experience? Can you show any success stories/examples that you have been involved in?
5. What are the reasons for not implementing MDM (enterprise-wide) before and what are the reasons?
6. What could be the benefits according to you of MDM?
7. Should MDM solution emphasize more on technical architecture or on the business function?
8. Who should be the owner of master data in the organization?