



## REVIEW ARTICLE

### MONETIZING CORPORATE AND USER DATA: THE CATALYST FOR BUSINESS INTELLIGENCE ADVANCEMENT

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#### ABSTRACT

In today's economic landscape, businesses of all sorts and sizes have moved towards incorporating different aspects of business intelligence as a main source of decision making and a strategy to maximize profits. Yet, the drive for business intelligence growth of acceptance and incorporation is overshadowed by the reasons why it has been adopted. This proposes an identified research problem and is one which lacks to be covered directly in the literature review research. Which ultimately translates to a lack of reasons as to why business intelligence has evolved the way it has. The authors of this research, propose that business intelligence has had a catalyst for its advancement and that catalyst has been identified as the monetization of data. To be more precise, corporate data monetization as well as client or user data monetization are the proposed catalysts for business intelligence advancement and innovation.

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## INTRODUCTION

On this section, the research provides a brief summary of what is data monetization (DM), how it contributes to organizations, as well as the different types of monetization of data that businesses focus on. The authors contribution to the field is stated as the identification of a direct correlation between the monetization of data and business intelligence (BI) advancement. Initially, the literary review has the goal of presenting new knowledge about what is the drive behind BI advancement in organizations. In order to move towards a theoretical analysis about how BI tools have been defined by the pursuit of profit, in the way of DM. Aside from these, the subject of data warehouses (DWH), with its data warehouse and business analytics environment, is included as an essential part of the discussion (Rajadarshini and Alageswaran, 2016). BI counts with a notoriety in the business world as it has helped to evolve many businesses, utilizing decision support systems, from exclusively making a fixed profit from selling goods and/or offering services to becoming an organization that can benefit from much more (Sarma and Sivarama Prasad, 2014). BI has opened the door for new business models to be implemented that offer a variety of manners in which to make profit, with the introduction of technology and its many tools to its day to day operations. There is an expectation that BI helps to advance the business in which it is being implemented and

ensures the maximization of profit with the resources it possesses (Parker, 2012). There is a perspective of originality when it comes to BI, which is, that one of its components has found the way to profit from something that until recently was considered only for decision making (Hasty, 2015) and (Hamid, 2015). Additionally, BI brings an inventiveness that comes from the environment it creates where businesses and its subsidiaries from all over the world can connect to the same DWH and look for data to analyze, study and monetize (Feldman, 2013). This kind of DM is from data of internal workings or executions of the business, which in this research is presented as corporate data monetization. Which then creates a link of its own between businesses and subsidiaries all over the world with real time data, available to make real time decisions from the analysis of said data. BI covers a wide range of tools for implementation in businesses from data sources, online analytical processing, data warehouses as well as data marts, real time business intelligence, advanced analytics and corporate performance management, these are all tools constantly evolving and being implemented into new projects and a tool which was design for a purpose could eventually serve another (Ranjan, 2009). From these, DM comes from data analytics or advanced analytics which offers businesses the options of data or text mining the information that already exists on the available DWH environment. This mining of corporate as well as user data has been the chosen tool to offer the most profitto organizations from BI. While the architecture of BI is constantly evolving, and changing for the purpose of this research BI offers an architecture which has

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four main components. These four main components can be summarized as data warehouse, business analytics, business performance management and the user interface (Turban, Sharda and Delen, 2011). The tools presented in this research as being part of the architecture of BI offer solutions and decision support as well as helping to better understand the business it is being implemented in. As part of the data analytics architecture forefront DM is the main source for providing profits (The Data Economy: Fuel of the Future, 2017). The importance of BI is the fact that through DM it creates a way to profit and to maximize even further the potential to profit from all of the work the business is doing. Better explained as the way in which a business takes its own information and with it understands itself better, identifies where to incorporate more resources as well as to know where to economize efforts all in a more seamless manner without much effort (Maté *et al.*, 2015). With the establishment of DM in businesses, be it as a main or secondary source of profit, the traditional business model has been disrupted. As for the research problem, we discuss in this investigation, being the research gap as to what causes BI to evolve the way it has, because BI did not have a programmed evolution pattern.

### Research Justification

There is a research gap which needs to be attended, that is stated as the establishment of a direct correlation of what drives the advancement of BI in all types of businesses (Zandi, 2014) and (Sarma and Sivarama Prasad, 2014). There are different ways in which to monetize data, including monetizing user's data and although this brings confidentiality conflicts between users and the organizations which look to profit from it (Guzmán-Rodríguez, Medina-Sánchez and Ojeda-Castro, 2017) and (Parker, 2012) this research does not concentrate on this subject. Users of BI in businesses are constantly using their data for various kinds of monetization and this same organizations are now moving towards using their users/client's data in order to continue to profit (Najjar and Kettinger, 2013). Organizations concentrate their data monetization efforts in different manners aside from preparing and selling to external buyers, it monetizes from analyzing the inner or corporate data of the organization to better understand and maximize its operations capabilities (Woerner and Wixom, 2015). Even though the monetization of data has not come under scrutiny from the government or any regulatory agency, it has, none the less, left a gap on whether how or what to charge for said data (Roderick, 2014). Based on the research, there seems to be a relation between the monetization of data and where an organization focuses its strategies. Recognizing that BI in organizations has many tools to its disposition and that it is used as a strategy tool, in this research the DM factor is regarded as the implemented drive for BI advancement in organizations. As such, the main focus of this research is the relationship between BI advancement and DM.

### Research Contribution

Building the foundation of this research on literature review has helped to reveal that DM originally served as a tool of BI but with time, has become a driving force for BI with data warehouses offering a link between the two. With this foundation, the research aims to debate the data warehouse component of organizations as it has a very strong relationship with the proposed correlation between DM and BI, as it serves as a bridge between the two. With the mindset of identifying a direct correlation between DM and BI advancement, DM has

fallen under the criteria of corporate data and user data monetization. The original contribution of this research is the use of DM to explain BI advancement to this point and the reasons it will continue to do so. This contribution is being validated by a literary review which looks to identify the catalyst for the evolution of BI advancement.

### Literature Review

#### The Relationship Between Business Intelligence Advancement and Data Monetization

Data monetization has advanced BI in today's economic landscape of a data economy and before establishing monetization, the tool of mining must be addressed. According to (Maheshwari, 2015) data mining is considered an art, the art of discovering unknown knowledge, patterns as well as understandings from extracting workable and functional patterns from data. Some of the methods and algorithms of common use for data mining are classification, regression, precise prediction, velocity, robustness, scalability and interpretability (Turban, Sharda, & Delen, 2011). It has been pointed out by (Najjar and Kettinger, 2013) in the past, that organizations will advance the available tools for data monetization depending to many factors, specially data infrastructure and human capabilities (Kimble and Milolidakis, 2015). Which is safe to partake in adding that as DM is a tool of BI, when DM advances so does the BI of the organization. The monetization of data has been presented as the reason why the BI of an organization furthers its reach. The same authors continue to embark on the premise that continued assessments must be incorporated to ensure frequent advancements and clear strategy pathways of profiting from the monetization of data. Which falls perfectly in line with (Zandi, 2014) when he states that for an organization to achieve good strategies an appropriate DW architecture has to come from a perspective of BI, that needs to be a contribution to the key DM factors which will guarantee success.

Organizations count with an architecture that is very similar between each other, when it comes to processing data as it is in recollecting data either internally, from users or buying it from data brokers (Roderick, 2014). Once the organization has the data it will store it on its DWH infrastructure, it will continue to mine it and eventually monetize it, profiting from the data one way or another (Feldman, 2013); (Najjar and Kettinger, 2013) and (Wixom, 2014). This is a cycle because once an organization realizes it possesses a profit-making asset it will exploit it and the success of said exploitation will cause the whole process to be repeated, to guarantee more profits.

This repetition is what has been making DM be the catalyst for the advancement of BI, as this whole entrepreneur of monetizing data occurs within the BI environment of organizations. For BI, the software development lifecycle of DM is one that lacks stagnation and is constantly evolving itself in order to provide the needed recognition of profit-making assets and with this recognition it guarantees that it will advance the processes (Hamid, 2015). This brings us to examine whether DM alone can be a catalyst for BI advancement. Looking for a bridge of this gap, the research focused on what business intelligence is and how it has advanced in organizations from its first inception. As well as focusing on one of BI's tools, data mining and the process of monetizing data as it has made an incredible difference on the advancement of BI (Khan and Malluhi, 2010). There is a trend

which has been monopolizing the most profitable segment of the economy and said trend is beginning to be known as “data economy”. This trend is being defined by organizations which have been established for years as well as newly formed, that are adapting data monetization as their biggest revenue provider and in occasions, mostly in the newly formed organizations, data monetization is offered directly as a service (The Data Economy: Fuel of the Future, 2017).

### Corporate and User Data Monetization

Although data monetization best practices have yet to be identified and the literary review research has offered a literary gap, it is a field which is beginning to be understood as well as to be investigated, because of an apparent wide availability of sources of diverse information (Maté *et al.*, 2015); (Kimble and Milolidakis, 2015) and (Roderick, 2014). When we talk about either corporate or user data monetization this research refers to the ways in which organizations can profit from data from its users or its inner corporate data, in more than one way (Woerner and Wixom, 2015). The monetization of data can be described as a well-balanced ecosystem in which the user, the organization, the sellers, the buyers and all that are involved benefit in some way. However, organizations gather, prepare, use and sell the user’s data without the user’s knowledge of what it will be done with it (Parker, 2012). Many organizations offer free products for feedback or rewards for user’s demographic or other information, it can be considered an ecosystem in which there is a masquerade of everyone getting what they want (Feldman, 2013).

An ecosystem where the offered resources are leveraged with the exchange of data in which all its characters play their own role and benefit in one way or the other at some point. As specified before, the user is part of a population of day to day people as well as organizations of all sizes. DM has been known to create new business models for the organizations which benefit from its implementation and as such, also create new ways to profit, ways in which to distribute cost, value and how it conducts itself in the new data economy (Najjar and Kettinger, 2013). When operating under this new business model, all of the data which the organization can get their hands on, be it inner/corporate or user data is considered a revenue generating product which will cover the cost of the implementation of all of the subparts of the newly incorporated business model, either by profiting directly or indirectly when exchanging it for other benefits. From the ongoing successful implementation that organizations have found when dealing with DM, a new way has been provided in which to operate where the factor of DWH is of extreme importance and it needs to be combined with BI to be on the constant search for different types of DM which the organization can provide (Boni, 2013). This search has already provided studies that look to analyze the relationships between the variables surrounding DM looking to predict future trends and to make BI an even more effective tool (Khan and Malluhi, 2010).

### Business Intelligence in Organizations

In recent years, there have been many different propositions as to how to define BI, but there are very similar components on all of the definitions. These are factors such as that BI is used to collect data in order to facilitate the decision-making process of organizations, the collection of information to alleviate the impact of uncertainty, a tool having the ability to attend a multiplicity of users at the same time when analyzing

heterogenous information and to have the ability to give reports with statistical analysis of the past in order to be able to predict future occurrences (Ranjan, 2009). Originally the term was coined by the half of the 20<sup>th</sup> century by the company IBM, however, the way the world knows BI today is closely related to the Gartner’s Group definition offered in the year 1996, which takes on a set of tools including DM and orient them towards reaching competitive advantages (Khan, Pradhan and Fatima, 2016) and (Ranjan, 2009). BI has come to be generally known as the integration of human cognitive capabilities paired with artificial intelligence to manage and support the decision making of organizations in order to solve organizational problems (Turban, Sharda and Delen, 2011).

As (Sarma and Sivarama Prasad, 2014) mention BI in organizations has become an indispensable tool for decision making and it has been implemented in the majority of organizations who look to maximize its tactical decision-making abilities in today’s economy. This is the case for BI from recent years as it began as a static, concentration of unstructured data unusable for decision making. As the traditional business model has been disrupted the same way the authors share the fact that there is a need to extend the functionality of BI, it is proposed that this extension has to be made towards facilitating DM, in order for it to advance BI as perpetual cycle. In order to identify, create or develop new opportunities of profit, decision support systems, strategy or ways of interchangeable resources there is a clear need to develop a very strong foundation of the correct and appropriate BI (Boni, 2013) and (Zandi, 2014). In essence, as more advances there are in BI the more advances the organization will see. From this, the DM business model presented by (Guzmán-Rodríguez, Medina-Sánchez and Ojeda-Castro, 2017) presently is and will continue to be the catalyst for BI innovation.

### A Proposed Model Within the New Data Economy

The study of DM has provided the insight needed as to better understand what is the motivator as well as the catalyst for the advancement of BI, it explains how businesses have moved towards a data economy (Alvarez, 2015). This trend is considered to be the new way of economic growth of this century as every organization has dedicated a vast amount of resources towards the implementation of some kind of DM (The Data Economy: Fuel of the Future, 2017). This gives the research a standpoint as to better understand not only if DM is helping advance BI but to know the why it is doing so. Following the research, organizations are offering services and products with which they collect the data of users, accumulate said data in the organizations DWH architecture, run it through the business analytics architecture where they mine the collected data and then begin the monetization process as to sell it or use it for the decision-making process related to the maximization of resources of their operation (Guzmán-Rodríguez, Medina-Sánchez and Ojeda-Castro, 2017). The impact which the research has presented is taken from how the business analytics environment works, as such the organizations mine data either internally or from users, to send it to the data warehouse, where it continues to be mined to then be monetized in as many ways as possible, as it is being monetized then it will bring profit and from said monetization and profit, business intelligence will advance. As we can see in Illustration 1.0.

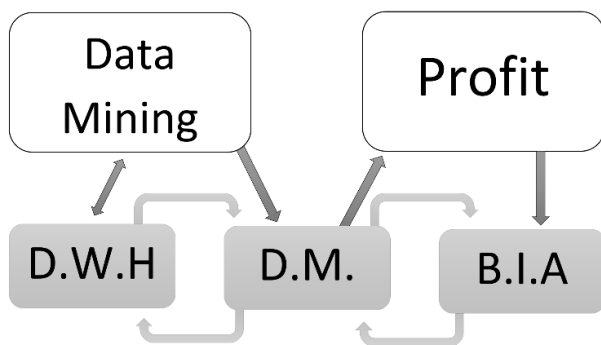


Illustration created by the authors, 2018

### Illustration 1.0 Data Monetization Impact on Business Intelligence Advancement

The reason why BI will advance is presented as being the search of the organization to look for better and more suitable ways in which to evolve its already existing revenue making architecture. From this illustration of the proposed way in which DM advances BI there can be a look at a precursor to a new business model in these data economy times were more and more organizations are moving towards a new business model. Although this new business model for the new data economy is being worked on by different organizations until finding the one which works. There is a very close relationship in how the BI moves forward and its constantly evolving because of DM and the search for better, faster and more efficient ways to monetize data, with these proposed new business models. This study presents itself with certain limitations as it lacks a mathematical or statistical examination of how much impact the tools available to BI affect its advancement. However, the research has shown that there is a clear fashion or modality which is being widely accepted of monetizing the mined data available to organizations. From a critical standpoint, DM has a theoretical direct correlation with BI advancement, however in order to substantiate this statement a statistical proportional relationship model must be incorporated, as it would be a regression model, after enough empirical data has been recollected in order to test it using available programs. Although BI counts with many tools for implementation, these are to be considered different variables in which DM must be one of them and a specific regression model has to be created and evaluated. Further research must be implemented in order to better understand the motives of organizations to move towards a data mining culture, being the search of better knowing itself, merely profit based or the fact that the economy is moving towards this fashion of DM.

### RESEARCH DISCUSSION AND CONCLUSION

BI advances in organizations are directly affected by the different kinds of DM presented in this research, because of their very nature of garnering profit. As such, these organizations have and will continue to monetize on data, as the research has shown that this is a trend and has altered business models in all organizations permanently (Wixom, 2014). BI will continue to advance while organizations are willing and able to evolve their DW architecture and other variables to maximize DM. Which has resulted in stating that there is indeed a relationship between DM and BI but that DW needed to be implemented as this is the bridge which connects the two in organizations (Zandi, 2014). Looking to breach this research gap the literary review was implemented. Offering

insight as to what and how organizations are editing their business models to work with and implement the different kinds of DM strategies. When explored unilaterally the BI tools available help organizations work better while helping maximize gain and minimize loss (Turban, Sharda and Delen, 2011). Nonetheless, through the established research, when applying the BI tools bilaterally a significant relationship forms and in the case of DM, the literature has shown that it was a strong relationship. An important limitation of the research contribution is that it lacks a statistical or mathematical model in order to measure relationships and correlations between the presented variables as well as variables not considered for the research, such as other BI tools. With the results of the statistical model needed, the contribution of this research can be supported and help establish a new maxim in which DM, from the organization's advancement of BI, is affecting business models of organizations big and small. Another limitation identified from the research is that the literature on how the BI tools fuel its own development and advancement is very limited, while in the instance of this research, DM has been presented as a driving force of BI.

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