International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075 (Online), Volume-9 Issue-6, April 2020

Data as an Intrinsic Asset Component in Data Supply Web Model – An Exploration

Krishna Prasath S, Lakshmi B

Abstract*: Information has contributed to the growth of many new business models. Organisations are now sitting on a pile of information, trying to make sense of it and extract valuable insights from it. The objective of the current study is to contemplate the necessity of treating information as an asset and discusses the challenges of presenting it on the balance sheet. The present organizational climate demands big data driven decisions without veracity and approximations, making the role of accurate data, more crucial. More accurate the data is, more leverage it would earn, hence accurate data will be of more value when compared to data with lesser accuracy. This article makes a humble attempt to iterate on the need of quantifying the value of data based on their accuracy. The article is an opinion paper that weaves around the philosophies of accounting, data science and tries to mimic the value web model from management science, for understanding the methods of quantifying the data. A thorough review of the literature and existing regulatory framework is done to derive the insights for the article. The paper helps Chief Information Officers, Chief Financial Officers and Chief Technical Officers to understand and value the information used in the business however does not restrict itself to the strategic information systems vested with these apex authorities. The paper believes that the value for data is generated from the moment it enters into the information systems or the manual records maintained and gets enriched with each and every additional transaction. Once a value is attached, the policies to manage and govern the information would automatically fall in place.

***Keywords*: Data as an Asset, Data Ownership, Data Privacy, Data Supply Chain.**

I. INTRODUCTION

Information has gained strategic importance with the advent of new data-centric business models. Every organisation is generating, collecting, storing, managing and processing volumes of data. The interconnectivity between machines has increased the generation of data with the advent of IoT services. The companies are now enabled to use the data to draw meaningful insights that could be used to develop new products or services or better the existing ones. Data generated by one company may not be useful due to the inherent nature of its business or due to lack of resources.

Revised Manuscript Received on April 30, 2020.
***** Correspondence Author
Lakshmi B*, Assistant Professor, Department of Commerce, CHRIST Deemed to be University, Bangalore, India. Email: lakshmi.b@christuniversity.in
Krishna Prasath S, Assistant Professor, Department of Commerce, CHRIST Deemed to be University, Bangalore, India. Email: krishna.prasath@christuniversity.in

Nevertheless, this data or insights drawn from this data might be very valuable to other companies (Atkinson & McGaughey, 2006). This has spawned a new data market for the exchange of data between related companies existing in the same ecosystem, thereby creating a data economy. An efficient data economy and data ecosystem would prove beneficial to several stakeholders in terms of enhanced business opportunities, creation of synergy, reduced costs (European Commission, 2017). The data that is so valuable and encompasses economic benefit has still failed to achieve a place in the company's balance sheet. Data has proved valuable to many sectors like healthcare, public sector, finance and insurance, telecom, media, entertainment and retail. The business manages various assets such as plant, machinery, a plethora of intangible assets but has not been successful in recognising this new class of asset – data. Though its importance cannot be denied, its recognition has been restricted due to the lack of validated measurement values (Stigler, 1961; West and Courtney, 1993, Lawrence, 1999). Due to this, it's been denied its rightful position on the balance sheet. Organizations have been recognizing the value of hardware and software used to collect, store, process and maintain but have been struggling to measure the value created as a result of all these processes. Moody, 1999 compared the process of creating information to a manufacturing process. "Data being the raw material, hardware and software being the plant and equipment that is required to convert the raw material to finished product, and the final product to be information that is sold to the customer" (Goodhue, Quillard & Rockart, 1988). While the hardware and software find a place in the balance sheet, the end result and other hidden costs involved in collecting, maintaining goes unaccounted for. The objective of the paper is to understand the characteristics of this new emerging asset class so that efforts could be taken to attach the right monetary value to this data and recognize it on the balance sheet. The paper also discusses the data value supply chain and proposes a conceptual model to understand the data points for an organization. This would help the policymakers to regulate the measurement of data to pave the way for providing a place for this data in the balance sheet.

II. CAN DATA BE DEFINED AS AN ASSET?

The theoretical framework released by ICAI in July 2006 defines asset as "An asset is a resource controlled by the enterprise as a result of past events from which future economic benefits are expected to flow to the enterprise".

So the essential characteristics of assets are

1. The enterprise must be in a position to excise control over the resource to be able to call it an asset. The word used here is control not own. That means, it is possible to control a resource or an asset even if the legal ownership may or may not vest with the enterprise. Information fulfils this requirement, though most of the times, the data collected by an organisation is not owned by them, they do exercise control over them since, and the raw data is processed and converted into useful information by the enterprise. Enterprise can excise absolute control over the information created by them. Companies like Bloomberg, Zerodha, Sharekhan amongst the other brokerage houses; companies like Google, Facebook can generate terabytes of data collected from their users and have absolute control over them. They can use it in their decision making, improvising their services, making profit; few companies use information as legal tender. It's a trade-off between the ownership and control. It has to be ensured that information, the enterprise is trying to control is collected, stored, processed and used without violating the privacy of the data owner. If sufficient control cannot be exercised by the enterprise, then it cannot recognise it as an asset.
2. It is a result of past events. Enterprises record each of the information generating from every transaction. These data collected and stored over a period of time is analysed to see the trend and predict the possible future use of such information. Therefore, information can be regarded as asset as it is a result of past events leading to the creation of valuable information.
3. Resource regarded as an asset, must generate future economic benefits to the enterprise. Information generates economic benefits to the enterprise when the enterprise sells the information. It can also generate economic benefit in the form of direct cash flows for brokerage houses. It can generate indirect economic benefits in the form of customer satisfaction, reduced employee absenteeism, reduced turnover, amongst the others when information is analysed and put to use. Even a single copy of excel can be converted into money.
4. An asset need not necessarily have a tangible presence. It can be intangible or monetary asset.
5. To be considered as an asset, the cost or value that resource carries to the enterprise must be measured reliably. This is where the problem lies for information. If an enterprise can reliably attach all costs incurred in collecting, storing, processing and using of the information, it can be recognised as an asset. Accounting fraternity across the globe are trying to propose a sustainable valuation model to measure the cost or value attached to the information of an enterprise.

III. GARTNER'S VALUATION MODELS

Frisendal (2012) proposes a concept map and business database model to value information asset in the business. Gartner has proposed different valuation models to cater to different needs and circumstances. Intrinsic value is calculated when the value is used for internal purpose like storage, insuring etc. This highlights the need to invest on the maintenance and security of the information. Business value is calculated when the information can be transacted for monetary gain or as barter tender. Performance value can be calculated when the information itself is a key performance indicator. However, this value might not be as useful as intrinsic or business value of information. The ultimate aim to assign a value to the information of the company is to initiate and prioritize the information governance practices.

IV. PROBLEMS IN RECOGNIZING DATA AS AN ASSET IN THE BALANCE SHEET

The current objective of the study is not so much on valuation but on whether information can be treated as an asset. If there exist, valuation models, what's stopping them from treating it as an asset. The following section discusses the concerns in treating information as an asset.

A. Comparability

If companies start showing information as asset on the balance sheet, it becomes difficult for the end user to compare the balance sheets of companies using different valuation models (KPMG, 2019). This might also lead to manipulations; the end users may be misled easily with over valuing and under valuing information as needed. This may increase the insider trading unless the information valuation is regulated. So, unless a regulatory framework is established to monitor and manage the collection, storage and valuation models to value information, showing it on balance is not possible.

B. Disclosure

A recent regulation in US has forced companies like Google and Facebook to disclose the value of information collected from every user. Now, this can have two consequences, it might make the users hesitant to share few information and the information flow might reduce. On the other hand, this might create a competition among the Facebook users, to make them more valuable, it might be seen as a status symbol.

One down side for the organizations is that when the users receive a report at the end of 90 days with the list of information collected from them and their value, they might start expecting the companies to compensate or pay the amount for sharing the data. This might create an additional cash outflow for the organization.

Few unique characteristics of information hinder the reliable valuation process of any given information. Therefore, though information is an asset, it cannot be classified under the existing asset class and a separate asset class has to be created.

C. Shareability

The Information can be shared and retained at the same time. This is the greatest barrier in valuing information (Oppenheim, 2004). If an organisation creates information, recognises it as asset, at the same time shares this information with its suppliers. Now, both the organisations are showing the same data as asset.

This count for duplication of costs will never be able to accurately measure the value of information.

Another important question the organisation has to ask is, does the value of information increase of decrease when shared? The answer depends on the type of information, if the information is a trade secret, then the value definitely reduces upon sharing. But, if it's a marketing information like an audio, video or picture about the product or services, the value increases as the information gets shared to millions of users.

D. Data Privacy Regulations and Ownership

So much consumer data is now being collected, stored and analysing to create hyper-customized advertising strategy, converting them into huge cash flows. This has only increased the greed of the enterprise to collect more and more data so that it could be monetized. In the process, the privacy of the consumer or the owner of the information is being disregarded as most of the data is captured without the knowledge or the consent of the data owner. The European Union's General Data Protection Requirements (GDPR) outlines the rules for data capturing, storing, using and sharing for companies. Another major concern faced by the organisations is the ownership of information. Unless the companies can prove the ownership on their information, it cannot find a place on the balance sheet. Therefore, companies are not in the favour of treating information as asset as it could lead to the problem of ownership. Rather, the companies prefer using the information and bother about valuing it or showing it on the balance sheet. On the other hand the evolution of big data has also necessitated the accountants, managers and other data handlers to initiate efforts for monetizing the data evolving through the organizational operations.

V. DATA SUPPLY CHAIN MODEL

"Big data is high volume, high velocity, and/or high variety information assets that require new forms of processing to enable enhanced decision making, insight discovery and process optimization" (Manyika et al., 2011).With such an enormous growth in the volume, velocity and variety of big data, the data scientists, miners and other users of big data are facing the issue of data proliferation, which is in turn, getting accumulated as a set of threats in the digital ecosystem. The concepts of value chains and supply chains are integral to the fields of business and management. This part of this paper tries to make a humble attempt in embedding the concept of value chain into the proliferated ideology of big data. A value chain is an encompassment of various subsystems that are interconnected to each other; these subsystems are nothing but the elements of inputs, processes and outputs. The concept of Virtual Value Chains originated in the 1990s. The value chains and virtual value chains can be used as analytical tools for assessing the value generated by data at different points or stages present on the chain. The big data value chain as illustrated by Curry et al. (2016) includes the following activities:

A. Data Acquisition

It is the process of capturing and cleaning the data from the various sources. This process is purely dependent on the infrastructure available at the firms. The reservoirs of data are scattered over various platforms and/or devices like sensors, audio and video recordings, networks, log files, transactions and transactional applications, web and social media.

B. Data Analysis

The data acquired from various sources are transformed and modeled, so that it can be synthesized for deciphering hidden information. It is noteworthy that the data, in this due course, has also started to inculcate additional values in it.

C. Data Curation

It is the process of putting the data into various applications, so that it can deliver valuable inputs and insights for the stakeholders, usually done by the data curators or the data annotators.

D. Data Storage

The traditional databases are being used for storing unstructured data and the relational databases along with the columnar databases are being used for storing the structured and semistructured data. However the complexity of big data has made data experts to explore and seek for new methods of storing.

E. Data Usage

It refers to the application of data along with inferences for the purpose of facilitating, business decision making processes. This includes various decisions sought at various hierarchical levels through transaction processing systems, decision support systems, management information systems and strategic information systems.

VI. DATA SUPPLY WEB MODEL

The attempts of various scholars in understanding and measuring the value of data through the concept of value chain has gained attention, however with such accumulating trends of data proliferation, it is inevitable to revisit the model and reconnect with the concept of value web. It is noteworthy that, Michael Porter himself has revisited his concept of Value Chain and iterated the importance of Value Web. A value web is the interconnected hub in which the resources, infrastructures including the big data of the technological environment, that will be used by a large number of firms in a given industry or across industries. It is essential to reframe the 'data supply chain model' as 'data supply web model', as even the traditional supply chains are increasingly becoming value webs that span and connect whole ecosystems of suppliers and collaborators; properly activated, they can play a critical role in reshaping business strategy and delivering superior results (Deloitte, 2015).

Value webs are featured by complex, interconnected, interdependent and inclusive relationships, where data or information flows ensuring learning, collaboration and enhanced productivity across the industries. The evolvement or supply of data from assorted points and devices, also possesses similar features of value webs, hence it would be ideal to compare data with value web rather comparing it with value chain.

Thus, data which evolves from each and every point in the business ecosystem is omnipresent, omnipotent and omniscient and will enable further decision making processes and inference processes reliable. As a resource, it is inevitable in the present era of analytics, artificial intelligence and glocalization. In the context of providing services, platforms like Facebook and Google are also extracting data from the users who have signed up to them. These kind of implicit extractions are referred to as 'Behavioural Surplus' (Zuboff, 2019). On the rear side of this extraction funnel, these organizations put the data for an assortment of applications. This had effect in the evolution of the concept of 'Behavioural Surplus'.

Along with data, there are two other distinct categories that have been identified as freely available resources in a digital economy, namely the content and the code. However the open content is already being regulated through the 'Creative Commons License System' and the open code through 'Open Source License' and 'General Public License'. Transparency and fair usage of codes and contents is assured by these frameworks, on the other hand neither there are efforts to regulate data nor there guidelines to define the ownership of data. This implies that the data is not always seen as an economic value generating resource or as an asset in the accounting prevalence. In other words, the concept of 'Behavioural Surplus' has not been quantified yet, irrespective of its varied economic benefits.

VII. RESULTS AND DISCUSSION

The study finds that data has all the characteristics to be classified as an asset. However, there is a need to address few difficulties in showing data as an asset such as comparability, valuation, disclosure, shareability, data privacy regulations and ownership. Previous researchers have proposed different valuation models, but no consensus has been reached. No practically viable valuation models have been proposed yet.

The economic value of data can be defined only when data is made available in its refined form. The process of refinement makes the data more valuable and hence it is often compared with the oil resources available in the earth. Also data is often analogized as infrastructure" (OECD, 2015). Markham (2013) compares data with the reductionist metaphors of human experiences. Nafus (2016) remarks a variety of metaphors allowing human attributes for data. Awati and Shum (2017) compare the evolving issues of surveillance, food, resource, space, industry and liquids with the nature of big data. On the other hand, big data is recognized as one of the forces of nature which has to be streamlined and controlled. Comparing and contrasting these ideologies will help us in understanding the multitude nature of data. However, the efforts of defining the economic value of data, has always landed up with impediments. This paper suggests that the value web model should be considered by information system managers across the eminent organizations which have already deployed block chains to manage their big data.

VIII. CONCLUSION

To put it in a nutshell, the value of data starts to get accounted since its inception. The value of data grows in a multivariate manner. In other words, with each and every transaction that uses data for business decision making, the value for data grows. Data flows through the various management information systems like transaction processing systems, decision support systems and strategic information systems. In simpler words, when data turns to information and to knowledge and apparently transforms into wisdom, the value vested in it, amplifies abundantly. The magnitude of amplification has to be measured and this paper suggests that the value web model shall be used for the same.

IX. FUTURE RESEARCH

The field of infonomics no doubt is an important one. A in depth research is required to customise the data supply chain for each organisation so that data measurement check points are established. Then, for each data points, suitable valuation model has to be selected and then the information can be valued. Regulatory framework for using a uniform valuation model for specific data points can be established. A separate class of asset needs to be created if we aim at placing this information on the balance sheet.

REFERENCES

1. Curry, E. (2016). The big data value chain: definitions, concepts, and theoretical approaches. In New horizons for a data-driven economy (pp. 29-37). Springer, Cham.
2. European Commission (2017), "Building a European data economy", COM(2017) 9 final, Brussels.
3. Goodhue, D.L, Quillard, J.A. & Rockart, J.F. (1988). Managing the Data Resource: A Contingency Perspective, MIS Quarterly 12(3), 373-392.
4. Keith Atkinson and Ronald McGaughey, 2006. Accounting for Data: A Shortcoming in Accounting for Intangible Assets, Academy of Accounting and Financial Studies Journal, Volume 10, Number 2, 2006.
5. KMPG 2019. Data as an asset. Retrieved from https://home.kpmg/xx/en/home/campaigns/2019/03/future-it.html
6. Lawrence, D.B. (1999). The Economic Value of Information, New York: Springer-Verlag.
7. Manyika, J., Chui, M., Brown, B., Bughin, J., Dobbs, R., Roxburgh, C., & Byers, A. H. (2011). Big data: The next frontier for innovation, competition (Vol. 7). and productivity. Technical report, McKinsey Global Institute.
8. Moody, D., Walsh, P.: Measuring the value of information: an asset valuation approach. ECIS 1999 (1999)
9. Oppenheim, C., Stenson, J., & Wilson, R. M. (2004). Studies on information as an Asset III: views of information professionals. Journal of Information Science, 30(2), 181-190.
10. Stigler, G. J. (1961). The Economics of Information. The Journal of Political Economy, 69(3), 213-225.
11. T. Frisendal, Design Thinking Business Analysis, Management for Professionals, DOI 10.1007/978-3-642-32844-2_9, # Springer-Verlag Berlin Heidelberg 2012
12. West, L.A. & Courtney, J.F. (1993). The Information Problems in Organizations: A Research Model for the Value of Information and Information Systems, Decision Sciences, 24(2), 229-251.
13. Deloitte. (2015). Supply chains and Value webs. Retrieved from https://www2.deloitte.com/us/en/insights/focus/business-trends/2015/supply-chains-to-value-webs-business-trends.html
14. Zuboff, S. (2019), The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power, Public Affairs, New York, NY
15. OECD, D. D. I. B. D. (2015). for Growth and Well-Being: Big Data for Growth and Well-Being.
16. Markham. (2013). Undermining 'Data': A critical examination of a core term in scientific inquiry, Retrieved from https://firstmonday.org/article/view/4868/3749

17. Nafus, D. (2016), "The domestication of data: why embracing digital data means embracing bigger questions", Ethnographic Praxis in Industry Conference Proceedings, Vol. 2016 No. 1, pp. 384-399.
18. Awati, K. and Shum, B. (2017), "Big data metaphors we live by. Towards data science", Retrieved from https://towardsdatascience.com/big-data-metaphors-we-live-by-98d3fa44ebf8

AUTHORS PROFILE

Prof. Krishna Prasath is a MCom graduate from PSG College of Arts and Science, affiliated to Bharathiar University, Coimbatore. He also possesses an MBA degree from the same University. He has cleared NET and SET in Commerce and NET in Management. He is currently pursuing PhD at Christ University. He has presented papers at various national and international conferences and has published articles in reputed journals. He has three years of industrial experience and six years of teaching experience. His current research interests are Branding, Social Entrepreneurship and Infonomics.

Prof. Lakshmi B is a MCom graduate from BMS College for Women, affiliated to Bangalore University. She also has MBA from Sikkim Manipal University. She has cleared NET, JRF and is currently pursuing PhD at Christ University. She has presented papers at various national and international conferences and has published articles in reputed journals. She has six years of teaching experience. Her current research interests are Human Resource Accounting, Infonomics, Employer Branding.