

Association for Information Systems

**AIS Electronic Library (AISeL)**

---

ICEB 2015 Proceedings

International Conference on Electronic Business  
(ICEB)

---

Winter 12-6-2015

## **A Review Of Data Monetization: Strategic Use Of Big Data**

Chien-Hung Liu

Chuen-Lun Chen

Follow this and additional works at: <https://aisel.aisnet.org/iceb2015>

---

This material is brought to you by the International Conference on Electronic Business (ICEB) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ICEB 2015 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# A REVIEW OF DATA MONETIZATION: STRATEGIC USE OF BIG DATA

Chien-Hung Liu, National Chengchi University, Taiwan, claudeliu@gmail.com

Chuen-Lun Chen, National Chengchi University, Taiwan, chencl@nccu.edu.tw

## ABSTRACT

In this data-rich big data age, industries are capable to collect data that could not be imagined before. Many industries today are now thinking of how to better use these data assets properly to generate value, either for internal or external purpose. Data monetization is adopted as one of strategies used to create additional stream of revenue from the discovery, capture, storage, analysis, dissemination, and use of that data. It gains in popularity among different industries. The three research questions of interest to this study are: (1) what does data monetization mean to business; (2) what are types of data monetization and industries currently use; (3) how to initiate a data monetization strategy. To address these questions, this study did a comprehensive review of prior research from academia as well as from industry. This study clarifies and defines the data monetization, presents the synthesis of use cases learned from other industries as well as provides guiding principles of how to start with data monetization. The contributions of this study are twofold. First, this paper contributes to industry communities that start to explore opportunities of creating value from their data assets but lack of directions and how to. Second, this study contributes to raise awareness of academic communities over the potential of big data monetization research and the opportunities in further discussing the converging information system and strategy domain.

*Keywords:* Big Data, Data Monetization, Strategic Use of Data, Big Data Application

## INTRODUCTION

In this data-rich big data age, industries are capable to collect data that could not be imagined before. Many industries today are now thinking of how to better use these data assets properly to generate value, either internally or externally. Data monetization is adopted as one of strategies used to create additional stream of revenue from the discovery, capture, storage, analysis, dissemination, and use of that data. It gains in popularity among different industries looking out for additional revenue stream to keep revenue growth objective. For example, a data monetary research of retail use case from *MIS Quarterly Executive* demonstrated that getting direct monetary value from a company's data is no longer elusive.[18]

Data monetization prompted as a new term in Google Trends after 2015 [11]. However, its early form can be traceable to retail and market research industries back to a few decades ago. For example *Tesco* and *Nielsen* (formerly known as ACNielsen), a global retailer and a global market research firm, has been exchanged their Point of Sales (PoS) data with market research firms for insight service for many years. *Nielsen* plays roles as both data aggregator and data broker that sell these aggregated insights to manufactures in fast-moving consumer goods (FMCG) industry. The driving force behind this information business is that FMCG manufactures are keen to know more about how their products are sold at different retail channels as well as about their category performance against their competitors. Today, other industries can learn the data monetization strategies from retail industry as data monetization is not long an elusive thinking [18]. It is a new business!

The objective of this study is to deepen our understanding of how data are monetized in industries where many of them either own a variety of data sources or process data that are specifically interesting to other industries.

The three research questions of interest to this study are:

- (1) What does data monetization mean to business?
- (2) What are types of data monetization and industries currently use?
- (3) How to initiate a data monetization strategy?

Scholars from *MIS Quarterly* identified that big data analytics have become increasingly important in both academic and business communities over past two decades [2]. Given this popularity on discussing big data analytics and technologies, strategic use of big data initiatives such as data monetization is less addressed in academia. This study attempts to further explore in this subject and also provides a direction for industries interesting to tap into data monetization subjects.

PwC-Strategy& estimates that the revenue from commercializing data will ramp up to \$300 billion per year in the next three to five years for financial sector alone [21], which echoes the importance of this topic.

This paper is organized as following sequences: (1) introduction; (2) research method; (3) discussion; (4) conclusion.

## RESEARCH METHOD

A methodological review of past literature is a crucial endeavor for any academic research [26]. Thus, the literature review and secondary research are chosen as main sources to define data monetization, discover and collect use cases. The literature review of this study was firstly based on the top 50 MIS journals by [15] and then cross-checked with top 109 MIS journals published by Association for Information Systems (AIS) [1]. As a result, 49 out of both MIS journal rankings overlapped were selected. This

study followed the search approach using literature vendor database indicated by [15] to cover the paper search for these 49 top journals.

In Addition, a review protocol to set up to review papers from academic as well as industry communities. In the academic paper review, Google Scholar and electronic scientific database (ACM Digital Library, ABI/INFORM Complete, ScienceDirect, IEEE Computer Society Digital Library, OmniFile (EBSCO), JSTOR, Wiley BlackWell and Web of Science (Thomson Reuters) are chosen for the reasons of their richness and importance of academic journals. To ensure data consistency and relevance across our collections, only publications contained the keywords “Data Monetization” or “Monetization” within their titles were retrieved. The choice of keywords within titles was intended to focus to search on publications of direct relevance to interest of this study. Only papers published within most recent 10 years (2010-2015) were considered to understand trends.

Considering the nature of data monetization that is often happened in the context of business, research and white papers from industry communities are also considered and reviewed so as to complete this study. In addition, the Google Scholar and Google Search are used as main search vehicles for industry papers. Industry thought leaders of data monetization related domain, such as Accenture, IBM, McKinsey, Auther D. Litte, and the Big Four consulting firms (Deloitte, KPMG, E&Y, and PwC) are also included into analysis. Furthermore, only papers published within most recent 10 years (2010-2015) were considered.

## DISCUSSION

### Definition of Data Monetization

Gartner research defines “Data Monetization” [20] as using data for quantifiable economic benefit while Wikipedia point out this economic benefit to revenue. It [27] defines “Data Monetization” as a form of monetization generating revenue from available data sources or real time streamed data by instituting the discovery, capture, storage, analysis, dissemination, and use of that data. Both definitions emphasize that economic benefit from value creation is the ultimate purpose.

From the analytic point of view, before data can be monetized, data need to be processed and discovered [16] [18][23]. Data monetization is also a value creation process that need different technologies and business know-how. [16] [18][22][23]. In addition, data monetization is an ability for a business [16][22] and is also a selling process of revenue generation [16][17] [18][22]. Worthnotingly, a scholar [22] believes the data source should consider internal and external data sources while another scholar [16] highlights that the directions of monetization can be internal or external to maximize the value creation.

Table 1. Synthesis of Data Monetization Definition [16][17][18][22][23]

|                     | McDonald & Lee (2013) | Najjar & Kettinger (2013) | Mohasseb (2014) | Prakash (2014) | Shukla & Dubey (2014) |
|---------------------|-----------------------|---------------------------|-----------------|----------------|-----------------------|
| Competiveness       |                       |                           | ★               |                |                       |
| Data Process        | ★                     | ★                         |                 |                | ★                     |
| Data Discovery      | ★                     | ★                         |                 |                | ★                     |
| Differentiation     |                       |                           | ★               |                |                       |
| Value Creation      | ★                     | ★                         |                 | ★              | ★                     |
| Revenue generation  | ★                     | ★                         | ★               | ★              |                       |
| External & Internal | ★                     |                           |                 |                |                       |

As a result of synthesis, this study proposes to define data monetization as a value creation and data management capability for a business that can generate additional revenue stream through external insight selling or through internal improvement of operational efficiency.

### Why Data Monetization?

A global survey by Gartner research [13] estimates that by 2016, 30% of businesses will monetize directly or indirectly their information assets through trade, barter or sale. This is mainly driven by the financial costs of management and emerging opportunities.

While data volumes keep massively growing, the cost and complexity of handling these data challenges make most businesses hang back. Nevertheless, today there are a few forces converging to create condition ripe for data monetization. First at all, the cost of data storage is massively decreasing, and ability to process and analyze huge volumes of data in real time is increasing. For instance, emerging technologies enable real-time execution, and increasing value of Big Data and Analytics [16][22]. Second, Business Intelligence and Analytics (BI & A) now are on the top list of C-suite agendas where they start to recognize the amount of under-utilized data [24]. One scholar [17] believes big data, BI&A and the cloud are three current IT trends that are enhancing the potential for data monetization.

### Data Monetization Framework

In the recent special issue of *MIS Quarterly*: business intelligence research, authors [2] proposed a good evolution model for business intelligence and analytics (BI&A), which [2] defined business intelligence and analytics (BI&A) as a related term and treat big data analytics as a related field that offers new directions for BI&A research. Therefore, they further classified the evolution of BI&A into three phases: (1) DBMS-Base, structured content; (2) BI&A 2.0: Web-based unstructured content; (3) BI&A 3.0: mobile and sensor-based content. Apparently, this BI&A evolution model is based on the nature of data.

Another scholar in *Harvard Business Review* [6] proposed another type evolution model, Analytics 3.0 framework, mainly based on the maturity of analytics.

Since both evolution models are comprehensive as well as widely recognized, this study adapt both model as data monetization framework in the hope to help businesses review their data assets and identify monetization opportunities from data possession points of view. Before data assets can be further used to create value, it worth reviewing the data assets on hands. This study suggests those pursuing a data monetization initiatives to use this data monetization framework as lens to self-diagnose the qualifications and conditions.

**Step 1 Analytics Maturity Check:** Analytics 3.0 framework can be used as first step to understand the overall analytics maturity for a business to further understand its current state of capabilities, maturity and gaps.

**Step 2 Data Asset Check:** To deep dive into data assets, this study suggest use BI&A 3.0 framework as second step to backward check if certain asset exist or not as this framework provides a good typology of data associated with analytics capabilities that help a business to define the potential scope of a data monetization.

The gaps identified between two models reflect the reality of conditions as well as insights and implications for the future directions.

Table 2. Analytics Framework for Data Monetization [2][6]

| Davenport (2013) |  | Chen, Chiang & Storey (2014) |   |
|------------------|--|------------------------------|---|
| Analytics 1.0    | Traditional analytics <ul style="list-style-type: none"> <li>◆ Primary descriptive analytics and reporting</li> <li>◆ Internally sourced, relatively small, structure data</li> <li>◆ “Back room” teams of analytics</li> </ul>  | BI &A 1.0                    | DBMS-based, structure content <ul style="list-style-type: none"> <li>◆ RDMS &amp; data warehousing</li> <li>◆ ETL &amp; OLAP</li> <li>◆ Dashboards &amp; scorecards</li> <li>◆ Data mining &amp; statistical analysis</li> </ul>  |
| Analytics 2.0    | Big Data <ul style="list-style-type: none"> <li>◆ Complex, large, unstructured data sources</li> <li>◆ New analytical and computational capabilities</li> <li>◆ “Data Scientists” emerge</li> <li>◆ Online firms create data-based product and services</li> </ul>   | BI &A 2.0                    | Web-based, unstructured content <ul style="list-style-type: none"> <li>◆ Information retrieval and extraction</li> <li>◆ Opinion mining</li> <li>◆ Question answering</li> <li>◆ Web analytics and web intelligence</li> <li>◆ Social media analytics</li> <li>◆ Social network analytics</li> <li>◆ Spatial-temporal analysis</li> </ul> |
| Analytics 3.0    | Fast business impact for the data economy <ul style="list-style-type: none"> <li>◆ Seamless blend of traditional analytics and big data</li> <li>◆ Analytics integral to running the business; strategic asset</li> <li>◆ Rapid and agile insight delivery</li> <li>◆ Analytical tools available at point of decision</li> <li>◆ Cultural evolution embeds analytics into</li> </ul> | BI &A 3.0                    | Mobile and sensor-based content <ul style="list-style-type: none"> <li>◆ Location-aware analytics</li> <li>◆ Person-center analytics</li> <li>◆ Context-relevant analysis</li> <li>◆ Mobile visualization &amp; HCI</li> </ul>  |

### Strategic Directions for Monetization

There are many use cases that demonstrate how different industries can leverage the big data for creating monetary opportunities. This study attempted to summarize these use cases as comprehensive as possible from academic as well as industries researches. The results are as follows:

Table 3. Summary of Data Monetization Use Case [4][5][7][9][8][10][14][25][18][16][21][20][19][24][22][23]

| Industry               | Monetized Data Use Case   |  |
|------------------------|---|--|
| Airlines               | ♦ Social network analytics for customer care  |  |
| E-commerce             | ♦ Online transaction verification   | ♦ O2O location-based promotion/advertising   |
| Financial & Insurance  | ♦ Credit/ debit card issuer fraud<br>♦ Auto or claims insurance fraud<br>♦ Branch site selection                            | ♦ Worker comp fraud<br>♦ ATM site selection<br>♦ Insurance Policy  |
| Media                  | ♦ Out of home advertising measurement   | ♦ Venues advertising analytics   |
| Real estate            | ♦ Real estate analytics- for investment<br>♦ High value prospect for residential brokerage                                  | ♦ Headcounts analytics- for site selection<br>♦ Footstep analytics- for Merchant rental                                  |
| Retail/ Brand Supplier | ♦ Mobile and App data analytics<br>♦ Retail location analytics<br>♦ Store visitor analytics<br>♦ Shopping hotspot analytics | ♦ Mobile location based promotion<br>♦ 1-to-1 Mobile advertising<br>♦ Catchment area analytics<br>♦ Competitor analytics |
| Government             | ♦ Infrastructure traffic planning<br>♦ Buildings occupancy<br>♦ City planning- road enhancement                             | ♦ Emergency alerts<br>♦ Traffic information and management<br>♦ New public facilities                                    |
| Tourism                | ♦ Tourisms POI analytics<br>♦ First and subsequent visited POI's  | ♦ Winter resorts catchment area analytics<br>♦ Hotel and restaurant offers   |
| Telecom- internal use  | ♦ Service uptake via Geo-marketing<br>♦ Geo-located CEM & customer care<br>♦ Web Analytics for Customer complaints          | ♦ Cell tower deployment assistance<br>♦ New services like location-based charging  |
| Transportation         | ♦ Route analytics for train companies bid for a franchise of a particular route   | ♦ Car volume analytics- road infrastructure Investment   |

Table 4. Telefónica- Use Cases for Data Monetization [24]

| Teleco Data application           | Use Case   |
|-----------------------------------|--|
| Retail                            | Use geo-location data to help retailers to identify new store site and understand customer profiling associated with it  |
| Train Companies                   | Usage passenger journey data to assist train companies bid for a franchise of a particular route   |
| Road infrastructure public sector | the volume of cars on a particular stretch of road at a particular time of day, with added information of the origin and destination of those vehicles to help determine the level of investment in new road infrastructure, junctions and roundabouts etc.. |

### Telefónica Example

Telefónica, S.A is a Spanish broadband and telecommunication provider, also one of global leading operator, with 317 million global customers, owning network in 15 countries, operations in 44 countries and 650 roaming agreements worldwide. This global reach has provided Telefónica the advantage of externally monetize its real data for revenue [24].

Telefónica established Dynamic Insights in 2012, a new global business unit aimed at delivering revenue from Big Data, was the first public announcement of a European operator actively engaging in a Big Data initiative that goes beyond in-house processes. Its use case is analyzed and break down by its applications as below. Fore example, Smart Steps service allows a company making more informed decisions on locations by understanding the profile of the true catchment area. There are three use cases from Telefónica [24] illustrating how telecos data are used by other industries: (1) Retail; (2) Training companies; (3) Road infrastructure public sectors.

**How to Initiate Data Monetization Strategy:**

**Guiding principles**

This study reviewed the data monetization related papers from industry thought leaders and summarized several guiding principles based on the similarities and dissimilarities of their methodologies. Of those, strategy, business model, mindset, marketing understanding, data understanding and capability, value chain, roadmap and privacy are most important dimensions considered by these industry thought leaders.

Any business interesting to start with a data monetization strategy may find these perspectives beneficial.

**Lessons learned**

In addition to points of views from industry thought leaders, a recent research from *MIS Quarterly Executive* [18] provides several good lessons learned of successful monetization of data:

1. Consider how creating and sharing data will change relationships and business models.
2. Identify where you currently are in the data monetization journey and where you want to end up with, including preparing your data for sales, assessing the need for value-adding third parties to join the data monetization ecosystem, and marketing your data.
3. Develop contracts to ensure adherence to data monetization policies.
4. Nurture trust between the involved parties.

Table 5. Methodologies in Data Monetization Strategy [9][12][17][21][20]

| Firms/<br>methods                     | Accenture   | KPMG  | Ernst &<br>Young  | PwC-<br>Strategy&   | Gartner  |
|---------------------------------------|---|---|---|---|--|
| Strategy &<br>business<br>model       | Treat the<br>information<br>business as a<br>digital business<br>start-up   | Shape your<br>strategies<br>Determine<br>broad business<br>models     |   |   | Develop a go-<br>to-market<br>strategy that<br>will underpin<br>these new<br>products                                |
| Mindset                               | Do not think of<br>selling data as<br>an all- or-<br>nothing<br>proposition |   |   |   |  |
| Market<br>Understanding               | Find a big-<br>enough sweet<br>spot   |   | Format &<br>additional<br>content (what)  | Understand<br>your customers<br>Size the value            | Identify the<br>strongest<br>vertical<br>opportunities.  |
| Data<br>Understanding<br>& Capability | Keep trust with<br>those whose<br>data is used in<br>the product            | Decide data<br>genome:<br>discover dis -<br>connectivity<br>and value | Bundle product<br>as a service  | Get to know<br>your data<br>Enhance the<br>infrastructure | Select which<br>sets of<br>skills/tools to<br>build in order<br>to create<br>products with<br>economies of<br>scale. |
| Value Chain                           | Manage the<br>information<br>business as a<br>value chain                   | Measure<br>network effect   | Time (when)<br><br>Availability &<br>interoperability<br>(where)<br>Sharing &<br>Engagement | Understand the<br>value chain                             |  |
| Roadmap                               | Scout the road<br>to long-term<br>growth                                    | Enhance<br>roadmap  |   |   |  |
| Privacy                               |   |   |   |   | Anticipate<br>potential<br>privacy issues<br>associated with<br>these products.                                      |

## CONCLUSION

This study found that data monetization is still a new this subject in IS domain and thus it is less addressed on leading IS journals. Yet, interestingly, this subject has been embraced by majorities of consulting firms, if not all. Data monetization also gained popularity among industries owning big data assets, i.e. telecommunication operator, retailer and etc., and information businesses. From the use cases analyzed in this study, results indicates that industry communities see data monetization as an exciting new opportunity that can help create additional revenue stream. In addition, the types of big data application currently used are rich as well as diverse, which sheds lights on how businesses with distinct data assets may unlock the potential of their big data assets.

It is evident to see the growing attentions related to data monetization from consulting firm which implies that these firms see data monetization as a new holy grail for the next future years and will continue to seize the opportunities of being part of in this new data monetization ecosystem, either role played as data specialists, data brokers or both.

Businesses planning to pursue data monetization opportunities may refer to the Data Monetization Framework, use cases, guiding principles and lessons learned proposed by this study to avoid mistakes while start to take action.

In additions, this study believes that there are great opportunities for academic communities to provide more forwarding looking theories and models to help solidify the foundations for data monetization and make this practice more practical. Why? Three reasons. First, data monetization has not gained sufficient attentions from academia. Second, ripping conditions has fueled more opportunities for data monetization as they are now. Third, there is still no universally agreed approach of how to initiate data monetization strategies among industry thought leaders yet. For future research, this subject also implies the research opportunities for IS scholars to tap into the converging information system and strategy domain.

The contributions of this study are twofold. First, this paper contributes to industry communities that start to explore opportunities of creating value from their data assets but lack of directions and how to. Second, this study contributes to raise awareness of academic communities over the potential of big data monetization research.

However, this study is not without its limitation. Despite the efforts made by this study in order to make use cases of data monetization as comprehensive and exhaustive as possible, it is not possible and feasible to collect all during the limit of time frame of this study.

## REFERENCES

- [1] Association for Information Systems (2015) 'MIS Journal Rankings', *Research*, available at <http://aisnet.org/?JournalRankings> (accessed 1 August, 2015).
- [2] Chen, H, Chiang, R.H.L, Storey, V.C. (2012) 'Business intelligence and analytics: From big data to big impact', *MIS Quarterly*, Vol. 36, No.4, pp.1165-1188.
- [3] Chen, S.C. & Liu, C.H. (2015) 'Exploring big data opportunities and challenges from a business ecosystem perspective', *Proceedings of the 2015 International Conference on Business and Information (BAI2015)*, Macau, China, December 7-9.
- [4] CSC (2013) 'Big data and analytics', White paper, CSC, available at [https://assets1.csc.com/big\\_data/downloads/Big\\_Data\\_Overview\\_Brochure\\_Dec13.pdf](https://assets1.csc.com/big_data/downloads/Big_Data_Overview_Brochure_Dec13.pdf).
- [5] Dadhich, L. & Gupta, V. (2014) 'Big data: a gold mine in Telcos' backyard', White Paper, Arthur D. Little, available at <http://www.adl.com/BigDataGoldMine>.
- [6] Davenport, T.H. (2013) 'Analytics 3.0', *Harvard Business Review*, Vol. 91, No. 12, pp. 64-72.
- [7] Eckert, C. Katsikas S.K., Pernul, G eds. (2014) 'User acceptance of footfall analytics with aggregated and anonymized mobile phone data', *Trust, Privacy and Security in Digital Business- 11<sup>th</sup> International Conference*, Heidelberg etc.: Springer Verlag, pp. 168-179.
- [8] EMC (2014) 'Big data means data monetization', *InFocus*, EMC Corporation available at [https://infocus.emc.com/wp-content/uploads/2014/07/4\\_-Big-Data-Powers-Data-Monetization-Infographic-FINAL-HI-RES.pdf](https://infocus.emc.com/wp-content/uploads/2014/07/4_-Big-Data-Powers-Data-Monetization-Infographic-FINAL-HI-RES.pdf).
- [9] Ernst & Young (2010) 'Monetizing digital media- creating value consumers will buy', *White Paper Media & Entertainment*, Ernst & Young, available at [http://www.ey.com/Publication/vwLUAssets/Monetizing\\_digital\\_media/\\$File/Monetizing\\_digital\\_media.pdf](http://www.ey.com/Publication/vwLUAssets/Monetizing_digital_media/$File/Monetizing_digital_media.pdf).
- [10] Frisiani, G, Macias-Lizaso, G., Singer, D. & Dijk, M.V. (2012) 'Trending now: The web 2.0 data monetization opportunity', *Recall No15-Monetizaing*, Mckinsey, available at [http://www.mckinsey.com/~media/mckinsey%20offices/spain/pdfs/recall\\_no15\\_the\\_web\\_data\\_monetization\\_opportunity.ashx](http://www.mckinsey.com/~media/mckinsey%20offices/spain/pdfs/recall_no15_the_web_data_monetization_opportunity.ashx).
- [11] Good Trends 'Data monetization' as a search keyword, available at <https://www.google.com/trends/explore#q=data%20monetization> (accessed 3 October, 2015).
- [12] Harris, J.G. & Alter, A.E. (2015) 'Six step to starting a corporate information business', Institute for High Performance, Accenture.
- [13] Kar, S.(2013) 'Gartner: 30% companies to monetize big data assets by 2016', *CloudTimes*, available at <http://cloudfutures.org/2013/01/16/gartner-monetize-big-data-assets-2016/>
- [14] Kolar, V., Ranu, S., & et al (2013) 'People in motion', Presentation slides, IBM Research, available at <http://comsnets.org/archive/2014/doc/Paper-4.pdf>.

- [15] Levey, Y. & Ellis, T.J. (2006) 'A systems approach to conduct an effective literature review in support of information system research', *Informing Science Journey*, Vol9, pp. 181-212.
- [16] McDonald C. & Lee, B. (2013) 'What's your data worth?', *Accenture Interactive – Point of View Series*, Accenture, available at [https://www.accenture.com/lv-en/~media/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Industries\\_16/Accenture-Whats-Your-Data-Worth.pdf](https://www.accenture.com/lv-en/~media/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Industries_16/Accenture-Whats-Your-Data-Worth.pdf).
- [17] Mohasseb, Sib (2014) 'Framing a winning data monetization strategy', KPMG Institute', available at <http://www.kpmg-institutes.com/content/dam/kpmg/kpmginstitutes/pdf/2014/WinningDataMonetizationStrategy.pdf>.
- [18] Najjar M.S. & Kettinger W.J. (2013) 'Data monetization in supplier chain', *MIS Quarter Executive*, Vol. 12, No.4, pp. 213-225.
- [19] Patrick, C & Gupta, A. (2013) 'Toolkit: A map of big data use cases for CSOs wishing to monetize their data', *Gartner Report*, Gartner Institute.
- [20] Patrick, C. (2015) 'Market insight: Opportunities for CSPs to monetize to data and analytics value chain', Gartner Report, Gartner Institute.
- [21] Plansky, P. Solomon, J., Karp, R. & Drisko, C. (2013) 'The data gold rush- companies need the right model and capabilities to monetize data', White paper, PwC-Strategy&.
- [22] Prakash, S.D. (2014) 'Big data led big monetization', *The Indian Journal of Management*, Vol. 7, No. 1, pp. 6-7.
- [23] Shukla, V. & Dubey P. (2014) 'Big data: Beyond data handling', *International Journal of Scientific Research and Education*, Vol 2, No.1, pp. 1929-1935.
- [24] Stone, L. (2015), 'Big data monetization in telecom ', *Dynamic Insight*, Telefónica, available at <http://dynamicinsights.telefonica.com/wp-content/uploads/2015/04/Big-Data-Monetization-in-Telecoms-Smart-Steps.pdf> (accessed 30 August 2015).
- [25] Tektronix Communications (2015) 'Data monetization- accelerate creation of new revenue stream', available at <http://www.tekcomms.com/sites/tekcomms.com/files/Data%20Monetization%20Datashet.pdf>.
- [26] Webster, J. & Watson, R.T. (2002) 'Analyzing the past to prepare for the future: Writing a literature review', *MIS Quarterly*, Vol. 26, No.2, pp.13-23.
- [27] Wikipedia (n/d), 'Data monetization', available at [https://en.wikipedia.org/wiki/Data\\_monetization](https://en.wikipedia.org/wiki/Data_monetization) (accessed 30 August, 2105).