

IMPLEMENT MOBILE LEARNING CLOUD PLATFORM – A CASE STUDY GIVE ME FIVE

TAI-NING YANG¹, WEI-YU CHEN² AND HENG-SHENG CHEN³

¹Department of International Business Administration

²Department of Mass Communication

³Department of Information Management

Chinese Culture University

No. 55, Hwa-Kang Road, Yang-Ming-Shan, Taipei 111, Taiwan

{ master; chenhs }@faculty.pccu.edu.tw; cwy4@pccu.edu.tw

Received July 2015; accepted September 2015

ABSTRACT. *The 21st century is an international community. Having second language skills is very important. Non-English speaking countries, which want to acquire a second language always take extra time for learning. In recent years, independent learning is gradually becoming a major trend due to the popularity of the mobile devices. Students are able to learn anytime, and anywhere, through accessible software. Undoubtedly, our state-of-the-art technologies have surmounted to break through the limitation of time and space. However, most of the language learning Apps are stand-alone operations. What is worse, the data monotonously are unification without customization. This study provides the cloud data access analysis of technology-assisted English software – Give Me Five. The system automatically records and analyzes on cloud after users logged in and experienced the setting process in the software. These deliberative results, provide the computer engineers as the basis for improving the next version. All in all, the ultimate goal is to reach the most accessible and efficient virtual-learning-environment.*

Keywords: Mobile Assisted Language Learning, Give Me Five, Learning analytics

1. **Introduction.** Mobile learning has a broader definition – the usage of technology and human services which can create the individual learning environment without constraints. Learners are no longer in front of the computer, or in the classroom. Mobile learning can considerably boom in these years and it has the following reasons. They are the increased device speed, the larger capacity, the faster phone network and the decreased costs, the compatibility between the multimedia software and smartphones.

The greatest advantage is the flexibility of Mobile Assisted Language Learning. It is available for (1) the rapid feedback, (2) the deliberate learning process, (3) the inter-communities support, (4) a virtual reality space for interaction with various learners, (5) twenty-four hours and portable availability. (6) Apart from the traditional text study, it adds video, audio, animation, games and other image-based subjects.

E-learning process can collect and analyze the data in all activities on the computer. However, the mobile device is limited. The hardware has insufficient memory and requires extra apparatus for data storage.

The software – Give Me Five is approachable in any time and place. The system is based on virtual machine cloud services cooperating with the IIS server and Microsoft SQL server. Mobile App is capable to download via the web service. The software can not only provide the English course but also track the history database. By the way, SQL Server is in a business intelligence module. English teacher can provide related reports and graphics. Furthermore, they also can upload revised textbook contents which have the relevant video image data in order to enhance the learning effectiveness.

2. About the Mobile Assisted Language Learning. General speaking, mobile learning is restricted by the screen size and its function. The operating interface is almost text-based. In the cause of attracting students' eye and enthusiasm, video and game-based factors are prerequisite. Duolingo is an excellent "language learning" website and App service. It is a several-stage-game design. The users have to vanquish the language challenge and reach the series of checkpoints. It undoubtedly stirs up the sense of interest. Meanwhile, the users are able to hold an online competition with their friends and encourage each other. The program simultaneously stores the users' learning messages and teaching methods and constantly adjust. The software samples are shown in Figure 1.

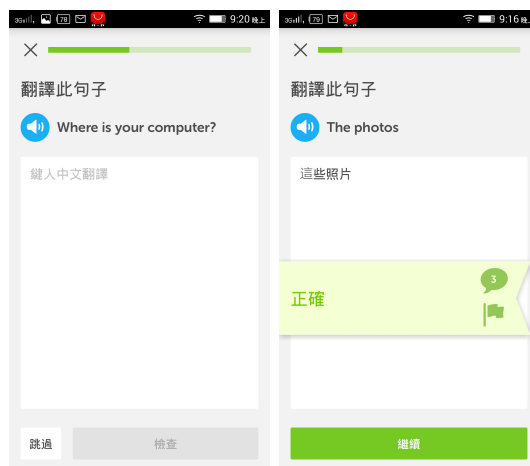


FIGURE 1. Duolingo App screen capture

3. About the E-learning Single Sign on. E-learning system's individual sign on is a groundbreaking technology. E-learning systems consist of kernel applications for managing the string of students' tasks. Some of the performances on mobile devices are far from the website. For example, on other educational applications, the controllers such as teachers and learners can communicate and record the process. Impressively, the OAuth generation sets up an authorization layer between "the client" and "the service provider". Client can only log in the authorization level. It subtly separates the two groups. Client uses token and the password for registration. Users can designate the authorized level of competence and validate the token. The same as HTTP, the programming languages of OAuth are based in a "neutral protocol". Hence, our implementation of reverse OAuth in Multimedia Assisted Language Learning can be easily ported to other LMSs. OAuth 2.0 is the next evolution of the OAuth protocol which was originally created in late 2006. OAuth 2.0 focuses on clients' and developers' simplicity while providing specific authorization flows for web applications, desktop applications, mobile phones, and living room devices. To use OAuth 2.0 protocol can make a real API access control; the users can operate the object API.

4. About Business Intelligence and the Learning Data Analytics. According to the researchers of Maastricht University mathematics course, it found some consequences about the basic and predictive academic performance needing more extensive information, for example, different assessment of performance during the course, learning strategies, learning attitudes. The study enables the researchers to understand learners' behavior.

Miller and Mork proposed excavation, consolidation and development of the value chain, which is shown in Figure 2. It illustrates myriads of information such as the relationship between the learners and the course. In order to improve the valuation, it can re-organize the study design based on the results of the analysis.

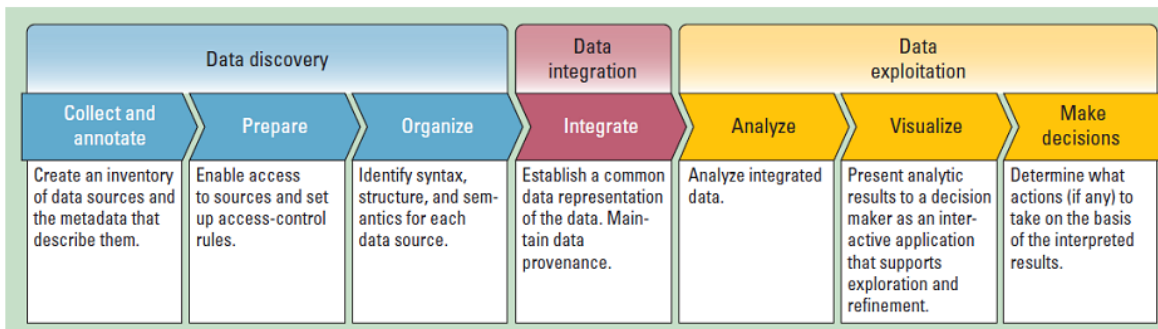


FIGURE 2. Miller & Mork’s data value chain

In terms of the collected data, the different work staffs filter relevant information. For instance, curriculum developers are relatively easy to understand the schematic image of learning when they want to track the information. Researchers need actionable information (Actionable Data) which guides teachers and course designers to ameliorate their teaching materials and architecture. It also provides useful and reliable advice. It provides the critical system and guides the development of new tools and services. The on-line tools and datum-help identify the important learning activities and behaviors.

Business intelligence can support managers to improve the quality of decision-making process, take adequate strategy to enhance an enterprise’s competitiveness and uplift the profitability by transforming internal and external data (both structured and unstructured) into useful information.

The framework of business intelligence system mainly includes the followings.

- (1) ETL toolkit: Daily transaction data were being ETL and transferred to data warehouse.
- (2) Data warehouse: The data from various databases were being extracted, transformed and stored in the data warehouse.
- (3) Business intelligence toolkit or platform: Include on-line analysis, query, report tool, and data mining and so on. It was mainly provided to decision-making.

5. The Give Me Five System. Chinese Culture University is located in Yang-Ming-Shan in Taipei. Students usually take bus which costs lots of time to school. It is very important for students to learn tutoring system under development’s assistance. The freshmen have to learn a second-foreign language in the university. The professional course has to help them digest both their vernacular and foreign languages such as the usage of sentences and vocabularies. Amazingly, Give Me Five system can generate the software to deal with the previous situation. With regard to the sentence learning, users must log in the campus system. The English major students, one day, have to absorb five sentences which are picked by the school teachers. Luckily, the off-campus students still can acquire the English sentences, texts, sounds, pictures and videos on-line. Of course, the data are all captured on cloud. Finally, the history data will transfer into useful reports by the business intelligence mechanism. They are available to English and professional subjects of cooperation teachers for providing content and reference system modifications.

The system has three main modules. Firstly, learning modules deal with English language learning-related functions. Secondly, the recording modules are responsible for the data collection and information exchange. Thirdly, BI modules are in charge of the entire useful information into the data warehouse and the decision for the system to produce useful information.

Now, we focus on the back-end development API. API can call through the corresponding proprietary, combine JavaScript, XML and JSON technologies of AJAX. Moreover, it can be applied to information presented on the iOS and Android.

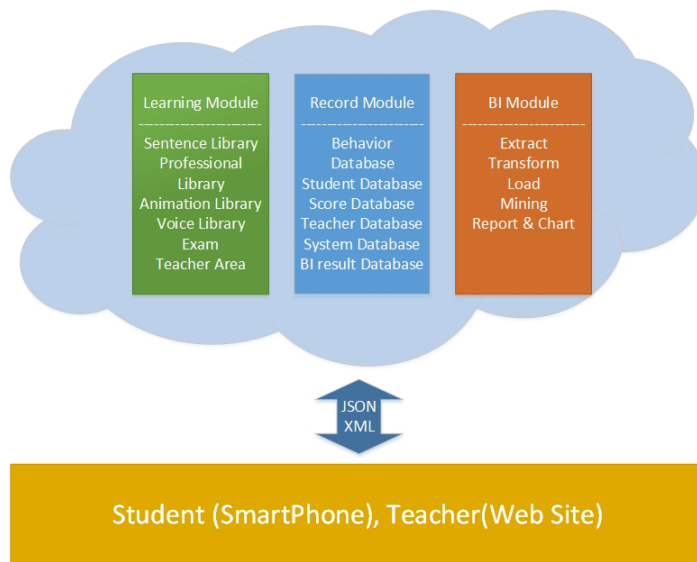


FIGURE 3. Give Me Five framework

Its framework is shown in Figure 3.

6. Implementations of Give Me Five System. In this study, Give Me Five web services build on the school’s virtual machine, shown in Figure 4. The client can be carried out through the http protocol data access. First, the user must install a dedicated App on iOS and Android platforms. The App internal application server is going to offer a token after you enter the account password. Both the user account and the token based accesses privileges in accordance with the servo too repository of relevant information. The last JSON format App obtains information on the phone for simple operation, presented to the user browsing.

Figure 5 illustrates the usage of the learning system among students, teachers and administrators three roles. Students can log in the platform to learn English; the teachers can go to the platform in accordance with changes in learning content analysis; the managers can oversee the history of the students’ original data. All the foregoing results of the analysis are put on the platform.

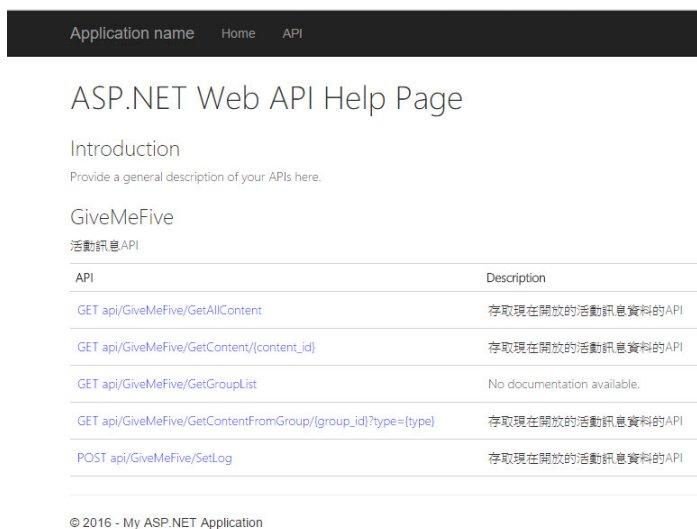


FIGURE 4. Give Me Five web service API

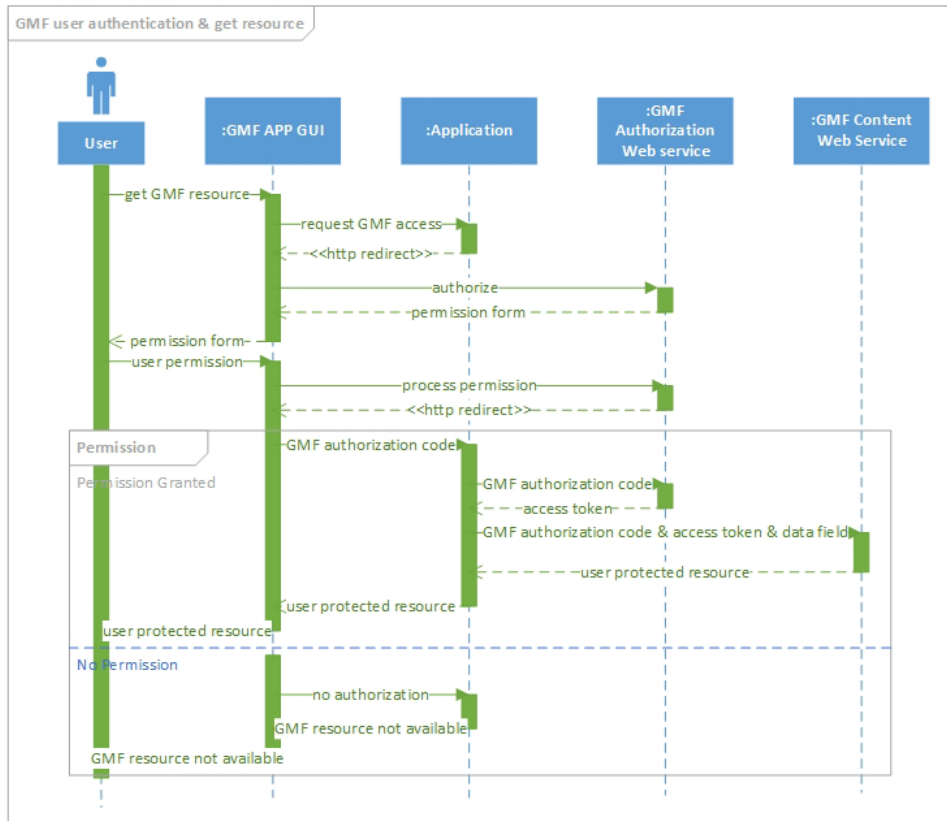


FIGURE 5. Give Me Five user authentication and get resource

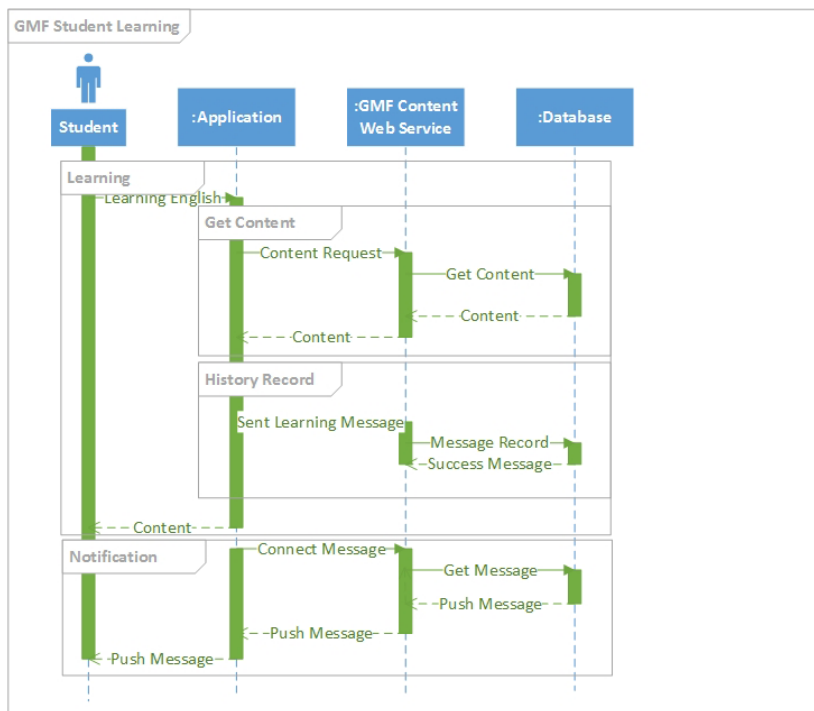


FIGURE 6. Students sequential diagram

Students' App of the process will face five main stage-by-stage activities. (1) Get learning materials when students sign in learning App page. (2) The App automatically generates script to extract the contents from the web service. (3) Web service extracts the contents from the database. (4) When students are learning, the system automatically records whole learning process in the database, classifies and stores the information based

on its characteristics in the database. (5) When students log in, the notification automatically pushes. It is shown in Figure 6.

Teachers' divided activity provides read and content analysis reports. When teachers log into the system, the system will provide a status report query students. Teachers can write learning content in the system. It is shown in Figure 7.

Finally, managers' activities are mainly stored in MS SQL. The original study was analyzed. Managers download raw data from MS SQL BI module with EXCEL analyzed

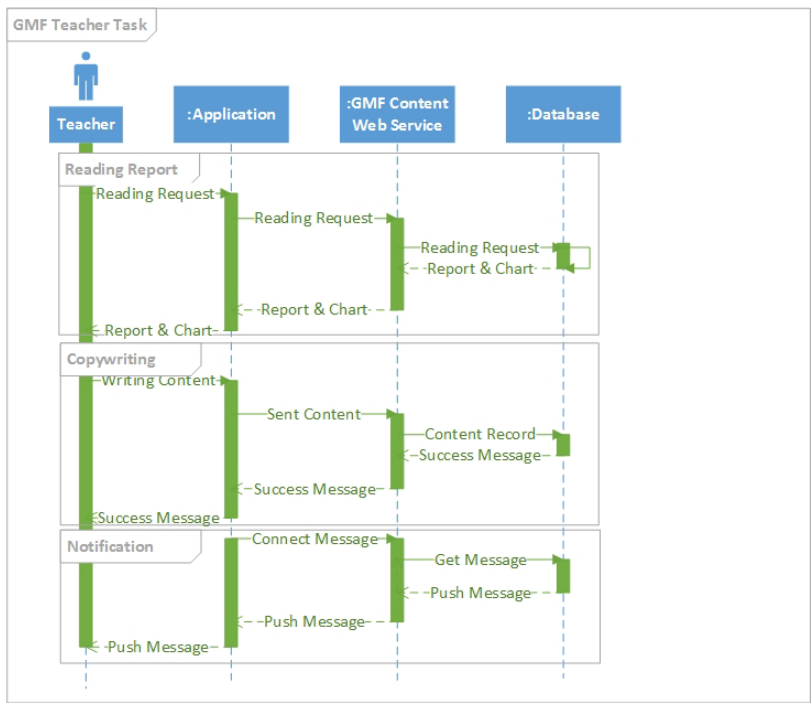


FIGURE 7. Teacher sequential diagram

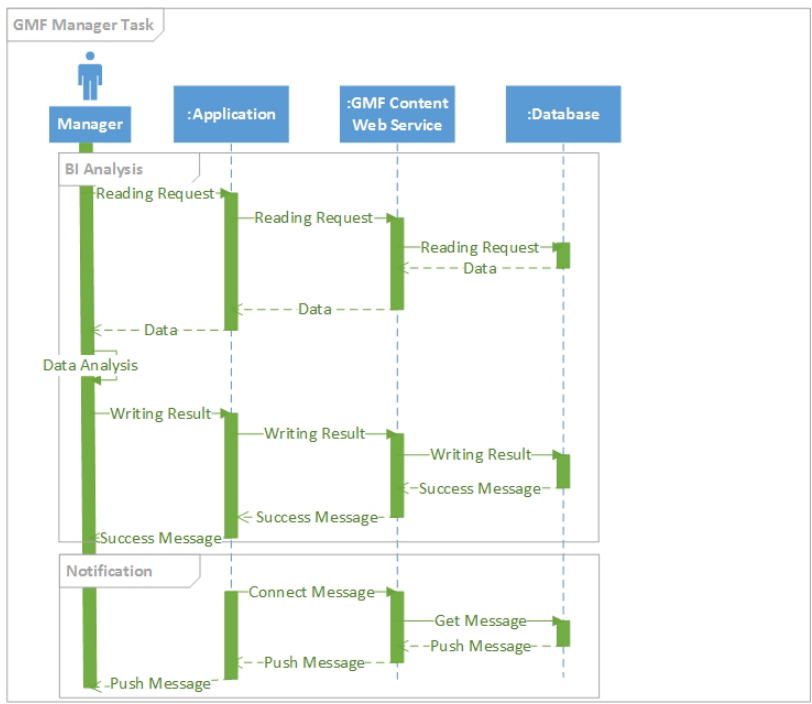


FIGURE 8. Manager sequential diagram

data. The result is converted to a chart stored in the database query for teachers. It is shown in Figure 8.

The information of the access method is shown as follows. Developers can write scripts in the URL, for example, <https://mobi.pccu.edu.tw/GiveMe5API/>, the example of retrieving different sub-parameter data. It is shown in Figure 9.

Application name Home API

[Help Page Home](#)

GET api/GiveMeFive/GetContent/{content_id}

存取現在開放的活動訊息資料的API

Request Information

URI Parameters

Name	Description	Type	Additional information
content_id		integer	Required

Body Parameters

None.

Response Information

Resource Description

[GeneralModelsOfGMF_ContentModelsWithChilds2](#)

Name	Description	Type	Additional information
HasError		boolean	None.
Message		string	None.
Data		GMF_ContentModelsWithChilds2	None.

Response Formats

application/json

Sample:
Sample not available.

text/json

Sample:
Sample not available.

© 2016 - My ASP.NET Application

FIGURE 9. Get content API screen

The results are back to a common JSON format after the developer programs the phone App resolved within the content. It can be presented on different platforms as well. It is shown in Figure 10. It makes easier to query on the server via a mobile phone App.

In the process of data transmission, the only band token and the password will not be transmitted in a plain language. The discreetly secure access is greatly reducing the risk of passwords being stolen.

7. Conclusions. In this study, the Mobile Assisted Language Learning platform user authentication mechanism brings the user to log in, to obtain the corresponding role, to allow the access to user's content. It had constructed its cloud platforms. The user data are also stored in the database through the API for subsequent analysis. BI module mechanism and the current EXCEL Pivot with Power BI data analysis module, we use artificial way to find correlation between the data. Through data collection and continuous improvement, the science-assisted methods can bolster students to learn a second language.



FIGURE 10. Android & iOS user interface

Chinese Culture University has Russian, German, Korean, Japanese and French Departments. If we build the Mobile Assisted Language Learning System, we can identify the effective conduct of the study through this App and enhance the competitiveness of Chinese Language and Culture University.

REFERENCES

- [1] S. McQuiggan, L. Kosturko, J. McQuiggan and J. Sabourin, *Mobile Learning: A Handbook for Developers, Educators and Learners*, Wiley, New Jersey, 2015.
- [2] K. Chachila, A. Engkamatb, A. Sarkawic and A. R. A. Shuibd, Interactive multimedia-based mobile application for learning Iban language, *Social and Behavioral Sciences*, pp.267-273, 2015.
- [3] M. Ma and S. Woodhead, Authentication delegation for subscription-based remote network services, *Computers & Security*, pp.371-378, 2006.
- [4] L. von Ahn, Duolingo: Learn a language for free while helping to translate the web, *Proc. of the 2013 International Conference on Intelligent User Interfaces*, New York, 2013.
- [5] M. Hashemi and B. Ghasemi, Using mobile phones in language learning/teaching, *Social and Behavioral Sciences*, pp.2947-2951, 2011.
- [6] J. F. González, M. C. Rodríguez, M. L. Nistal et al., Reverse OAuth: A solution to achieve delegated authorizations in single sign-on e-learning systems, *Computers & Security*, pp.843-856, 2009.
- [7] *OAuth 2.0*, <http://oauth.net/2/>, 2015.
- [8] D. T. Templelaar, B. Rienties, W. Kaper, B. Giesbers and S. S. van der Loeff, Mathematics bridging education using an online, adaptive e-tutorial: Preparing international students for higher education *Teaching Mathematics Online: Emergent Technologies and Methodologies*, vol.31, no.8, 2011.
- [9] H. G. Miller and P. Mork, From data to decisions: A value chain for big data, *IT Professional*, pp.57-59, 2013.
- [10] D. D. Wu, S. H. Chen and D. L. Olson, Business intelligence in risk management: Some recent progress, *Information Sciences*, vol.256, pp.1-7, 2014.
- [11] C. M. Olszak and E. Ziemba, Approach to building and implementing business intelligence system, *Interdisciplinary Journal of Information Knowledge, and Management*, pp.134-148, 2007.
- [12] H. Chen, R. H. Chiang and V. C. Storey, Business intelligence and analytics: From big data to big impact, *MIS Quarterly*, pp.1165-1188, 2012.