

# EMERGING THEMES ON FILIPINO COMPANIES' NEEDS TOWARDS QUALITY MANAGEMENT

Giuseppe C. Ng

Department of Information Science and Technology, School of Sciences and Engineering,  
University of Asia and the Pacific, Pasig City, 1605, Philippines  
giuseppe.ng@uap.asia

## ABSTRACT

Based on previous studies, there is a need for Philippines businesses to reinvent itself. Critical as it is to prepare for the future, for many local traditional companies, starting with adopting existing technology solutions to solve operational issues may be a more important first step. The study conducted attempts to identify a theme of current issues facing companies through keyword analysis. 26 companies responded and were willing to be profiled and their business processes were subjected through thematic analysis. The results showed that many still operate in manual and traditional ways and require existing system to automate their processes. Employment of systems can improve their capacity of quality management in the 4th Industrial Revolution. The result of this study could be used for further researches into key technologies that Filipino companies need to invest in.

**KEYWORDS** – Filipino Companies, Information Systems, I.T. Solutions, Technology

## INTRODUCTION

Technology has become integrated with everyday living. Technological advancement has made a profound impact, from televisions all the way to computers. Now, people have instant access to information and knowledge [1]. The role of Information Technology (I.T.) and information systems in businesses is growing, particularly into physical access control, to the paperless transformation of manufacturing, purchasing, inventory management processes [2][3].

Studies by the World Economic Forum in 2007 on the networked readiness index of the Philippines and Jack Ma's own assessment show that there is a lot of work to be done in improving the technology infrastructure of the country [1] [4]. This is consistent with the need assessment study by USAID and other local studies [5] [6] [7] [8].

Crucial in this age is the employment of quality management to focus on several key aspects like reliability, process validation and process monitoring. All of these helps drive the focus to customers and what their needs. Big Data and Data Analytics, for example, may play an important role in shaping businesses [9]. Quality management is not simply about reducing manufacturing defects, but also about reducing waste in business processes [10].

Given the importance of technology into businesses, through the University of Asia and the Pacific (UA&P) System Analysis and Design course, from 2016 to 2018, profiling and analysis was done on several companies to identify the most common issues that IT can address through thematic analysis. To ensure that incoming technologies will be vital in the modernization of Philippine businesses, we posit that for many of the traditional businesses, adopting existing solutions may be a vital first step towards laying the groundwork towards that goal. We aim to attain the following research questions:

1. What are the common operational problems that the profiled companies have?
2. What kind of systems these companies need to address such problems?

By identifying these themes, it may be used in further studies to provide focus on areas of improvement in the Philippines businesses.

**LITERATURE REVIEW**

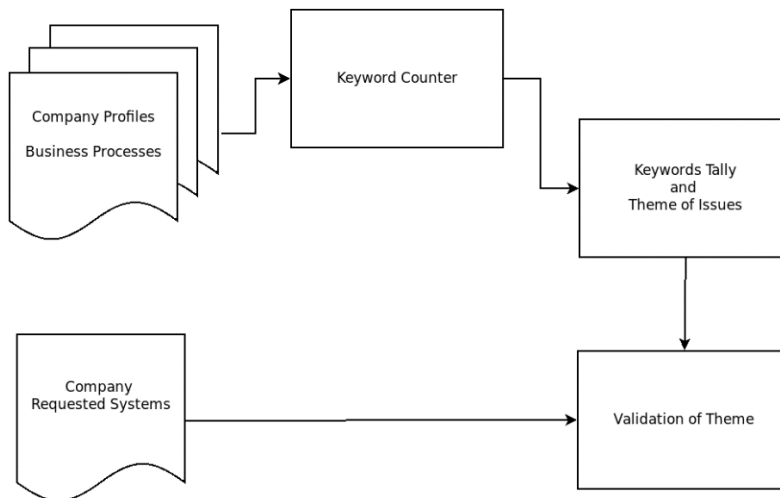
According to the USAID report, the Philippines needs to be able to engage both academia and industry in research and development and drive innovations. The reliance on traditional businesses and real estate has made investment in technology a risky proposition. Startups, small-medium enterprises, universities and major corporations must integrate traditional infrastructure with IT technology [5].

The need for innovation is corroborated by the study in [7], [11], and [12] where several aspects of the 4th Industrial Revolution need to be adopted such as Big Data, digital platforms and technologies and data analytics. Doing so can assist businesses in taking advantage of the potential that technology can provide towards productivity and customer management. In [13], the adoption of an Educational Management Information System was stressed for institutes to manage their units.

Quality management aims to control an organization to ensure quality in its business operations. Such can be broken down to several stages: (1) planning the goals of quality; (2) quality control of which measures are put into place to achieve such goals; (3) quality assurance which focuses on metrics for validation; (4) quality improvement. For the 4th Industrial Revolution, this entails tight synergy with autonomous systems and Internet of Things (IoT), effectively decentralizing the decision-making process and reducing inefficiencies in the business processes. Attaining this gives customers’ better feedback on the processes and services [10].

**Conceptual Framework**

To determine themes given qualitative inputs, counting keyword repetitions is one valid measure. Sentiment of the collective can be inferred when certain words show to occur several times. These words may include synonyms [14]. Given this, figure 1 illustrates the way the research is carried.



**Figure 1. Frequency of the Top Keywords**

With the company profiles and business processes documented. The documents are processed using a Keyword Counter program whose main task is to produce a tally of keywords. Analysis can be done on the keyword tallies to produce a theme that can be verified against the list of requested systems by the companies. Studying the theme allows us to highlight recommendations that aim to enhance quality management in participating Filipino companies.

**METHODOLOGY**

26 local companies were analyzed for the study. The following were the criteria of selection:

1. Companies must be at least a local representation in the Philippines.
2. Companies must have at least 2 years of operation.

With the companies selected, interviews and process observations were done. A company profile is generated based on the background of the company and its business processes. The company study specifically aims to accomplish the following:

1. To define the company, its business, and a brief history;
2. To define the company's business process that is causing problems for them;
3. To identify what system, the company needs.

Given the profiles, a keyword thematic analysis is done on the collected data. The theme can be identified through keyword repetition. Repetitive mention of words can be used as a direct way of identifying relevant linkages [14].

Table 1 illustrates the data analysis plan. Given the participating Filipino companies, interviews will be conducted, and actual observations of the business processes will be done.

**Table 1. Data Analysis Plan**

Research Question	Respondents	Data Gathering Instruments	Data Analysis
(1), (2)	Company Representatives	Interview, Observation	Keyword Analysis

Based on the interviews and data gathered, the texts were processed through a program that will count all the words. Exclusion list of words are noise words like 'a', 'an', 'the', 'is', punctuation marks and words that can identify the clients. Given the highest occurrence of words from the tally, themes about issues that the companies face can be leveraged. As explained by Ryan & Bernard, a program can be used to draw unique words and count how many times they appear to draw themes [14]. This process will be applied on a combined set of data from the company background and business processes of the 26 companies. The entire study is intended to discover emerging themes from the profiles created. The idea of emergence was based from works in complexity science as defined in [15].

**RESULTS**

A total of 26 Filipino companies profiled by the students for Systems Analysis and Design study. Compilation of the works was done by extracting the content into simple text files. This prevents format encoding from causing false positives when processing the database using the program. Table 2 lists the profiled companies down.

**Table 2. Profile of Companies**

Company category	No. of Years in Operation	Location
Auto Supply	20+	Laguna
IT Consultancy	10+	Nueva Ecija
College	65+	Oriental Mindoro
Rice Distributor	30+	Marikina
Industrial products manufacturer	10+	Nationwide
Medicine Distributor	7	Quezon City
Human Capital Consultancy	15+	Pasig City
Restaurant	15+	Mandaluyong City
Bicycle Distributor	7	Quezon City
Motorcycle Distributor	20+	Sultan Kudarat
Civil works contractor	10+	Quezon City
Auto Supply	10+	Manila, Makati, Marikina
Hotel business supplier	40+	Quezon City
Primary school	15+	Pasig City
Dentist Clinic	2	Laguna
Primary school	15+	San Juan
Primary school	15+	Quezon City
College Library	15+	Bataan
College	100+	Pasig City
Preschool Center	7	Pasig City
Dental equipment vendor	35+	Manila
Wholesale Distributor	10	Quezon City
Paper products distributor	30+	Manila
Hotel	30+	Pasig City
Primary school cafeteria	15+	Antipolo City
Food manufacturing	35+	Bulacan

The program processed 11,492 words and the following words were the most mentioned ones. Table 3 shows the top 28 words from the 26 company profiles. The results collate, to the best of the available tools' ability, words that have the same root words. The frequency of the words is arranged by row. Figure 1 shows a chart that highlights which were the most frequently mentioned words. From the results of the program, the most mentioned words had to do with system, company, inventory and processes. One can also see that manual, sales, transactions, service as part of the list.

**Table 3. Most Mentioned Words in the Company Profiles**

Most Frequent Words			
system(s)	company or companies	inventory	process or processes
student(s)	record(s)	library or libraries	employee(s)
customer(s)	book(s)	product(s)	manually or manual
service(s)	Time	branch or branches	department(s)
School	Data	information	Business
sale(s)	order(s)	transaction(s)	project(s)
Other	Day	done	Needs

Analyzing the correlation of the first row of words, the high frequency of usage of words such as inventory and processes imply the difficulty of managing inventory in many of the companies that were profiled. The top word being system may imply that there is a dire need for a system of some kind.

The next three rows of words show hints that the clients ranged from businesses to schools. Inventory management and are more likely to be associated with businesses. This is further supported by the keywords: products, and sales. The high frequency of mentions of the word manual may hint at the processes being not automated.

Looking at the recommendation from the clients and the company profile, we tallied several different requested systems. Table 4 shows the nature of operational problems and the number of companies that necessitate such solutions.

**Table 4. Operational Solutions by Company**

Operational Solutions Needed	Companies
Inventory management	15
Point of sales, client transactions processing, & sales tracking	10
Client tracking & appointments tracking	5
Student information management & Enlistment process	3
Human resource processes & Payroll	2
Service Processing	2
Library processing	2
Logistics	1
Accounting	1
Sales Forecasting	1
Training & Physical documentation	1
Requisitions management	1

The correlation of the requested solutions does coincide with the keyword extraction from 26 companies. Since companies do not necessarily only have 1 operational issue that needs solutions, the tally exceeds the total 26. 14 companies require inventory management solutions, citing manual operations and management of stocks. When looking at the keyword tally in Table 3, the results validate inventory is a significant issue. Considering that some of the companies are near or over 10 years in operation, it is worth noting from the defined business processes that these companies have still relied on a manual process to manage the inventory.

Point of sale and client tracking have also been requested by multiple companies as can be seen in Table 4. These also are highlighted from the frequency of keyword tally such as customers, transactions, and sales. Common issues seem to point to manual tracking of these pieces of data through spreadsheets, leading to data loss.

With regards to schools, student information management and enlistment automation have been requested. Similarly, there have been requests for library and other service-related automation. This coincides very much with the keywords highlighted from the company profile and process discussion.

## DISCUSSION

Given the following keywords: (1) system, (2) manual, (3) inventory, (4) process, and (5) records, there is a clear emphasis that inventory related problems are the most pressing. According to [16], inventory management is a very critical component in many businesses and industries. The use of such systems allows for automation, tracking and transparency of assets. Furthermore, the use of such systems can improve vendor relationships [16].

For the specific keywords: (1) customer, (2) service, and (3) process there is a need for customer-related services. Seeing that the succeeding systems sought after by participating companies are related to point of sales, and customer tracking. According to Simpson, customer tracking can lead to better analytics and improvement of business and marketing [17]. This, alongside the relevance of inventory management systems may lead to possible integration of the two functionalities. Seeing as this kind of complex system is the most sought-after solution from many of the participating companies, this might be a significant problem worth further inquiry.

With the following keywords: (1) student, (2) library, (3) records, (4) manual, (5) school and (6) process, automation is needed for the participating schools. It is possible that lesser known schools have need for more technology integration. A separate study can be done to focus on this specific need to improve the operations of schools and their libraries such as automation of class scheduling and IoT integration.

A common theme from all the participating companies is improvement of service through automation. All the participating companies agree that improvement of the business operation comes from adopting systems that can streamline their processes and improve the data management. This can be a possible link with USAID's needs assessment report. As highlighted there, technology adopting is crucial for the advancement of the Philippines' technology infrastructure [5]. Key integrations needed given the themes laid out is better control of the business processes and monitoring. For inventory systems, accountability and control of supplies is critical and can be addressed through automation. Gathering of such operational data can then be employed to improve quality assurance metrics through Big Data and Data Analytics [9]. Employment of technology to reduce the inefficiencies of the processes is critical in quality management in the 4th Industrial Revolution [10].

## CONCLUSIONS AND RECOMMENDATIONS

Given the emerging themes of the Filipino companies, identified that several of the participating companies still operate on a manual and traditional manner. These range from inventory management, to client tracking and sales, and student information management. The analysis also corroborated with the requested needs of these Filipino companies. Therefore, it can be concluded that:

1. The operational problems were identified using thematic analysis.
2. The kind of systems needed by the company were identified based on the thematic analysis.

The use of the thematic analysis corroborated with the requested systems and solutions that the Filipino companies themselves identified. With the results, further studies can be pursued with a larger data set to get a better understanding of the basic technological needs that most Filipino companies can pursue.

## REFERENCES

- [1] G. Ching and V. Pedrasta, "Trends and perspectives of information technology development in the Philippines: A review of Filipino-Chinese schools," *International Journal of Research Studies in Computing*, vol. 1, no. 1, pp. 3–10, Jun. 2011.
- [2] "The rising role of IT in physical access control - IFSEC Global | Security and Fire News and Resources," 24-Sep-2018. [Online]. Available: <https://www.ifsecglobal.com/access-control/rising-role-it-physical-access-control/>. [Accessed: 28-Jan-2019].

- [3] “The Role of Information Systems in Running the 21st Century Organization,” *The University of Scranton Online*, 22-Aug-2013. [Online]. Available: <https://elearning.scranton.edu/resource/business-leadership/the-role-of-information-systems-in-increasing-productivity>. [Accessed: 28-Jan-2019].
- [4] ABS-CBN News, “Jack Ma: PH can ride new tech revolution despite internet woes,” *ABS-CBN News*, 25-Oct-2017. [Online]. Available: <https://news.abs-cbn.com/business/10/25/17/jack-ma-ph-can-ride-new-tech-revolution-despite-internet-woes>. [Accessed: 28-Jan-2019].
- [5] “Driving Innovation to Deliver Economic Value: A Needs Assessment of the Philippines’ Technology Sector,” *USAID*. [Online]. Available: [http://www.stride.org.ph/wp-content/uploads/2018/01/A-Needs-Assessment-of-the-Philippine-Technology-Sector\\_UpdatedLayout.pdf](http://www.stride.org.ph/wp-content/uploads/2018/01/A-Needs-Assessment-of-the-Philippine-Technology-Sector_UpdatedLayout.pdf). [Accessed: 28-Jan-2019].
- [6] F. M. A. Quimba, J. R. G. Albert, and G. M. Llanto, “Innovation Activity of Firms in the Philippines,” *Philippine Institute for Development Studies*, 2017-44, Dec. 2017.
- [7] E. P. Dadios *et al.*, “Preparing the Philippines for the Fourth Industrial Revolution: A Scoping Study,” *Philippine Institute for Development Studies*, 2018-11, Aug. 2018.
- [8] “The Fourth Industrial Revolution: what it means and how to respond,” *World Economic Forum*. [Online]. Available: <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>. [Accessed: 28-Jan-2019].
- [9] S. Connell, “As Industry 4.0 continues to evolve, what can quality professionals do to ensure they will be an integral asset throughout this industrial revolution? - Quality in Mind,” *Quality in Mind*, 10-Jul-2017. [Online]. Available: <http://asq.org/blog/2017/07/as-industry-4-0-continues-to-evolve-what-can-quality-professionals-do-to-ensure-they-will-be-an-integral-asset-throughout-this-industrial-revolution/>. [Accessed: 28-Jan-2019].
- [10] H. Foidl and M. Felderer, “Research Challenges of Industry 4.0 for Quality Management,” in *Innovations in Enterprise Information Systems Management and Engineering*, vol. 245, M. Felderer, F. Piazzolo, W. Ortner, L. Brehm, and H.-J. Hof, Eds. Cham: Springer International Publishing, 2016, pp. 121–137.
- [11] “The digital edge for SMEs,” *Rappler*. [Online]. Available: <http://www.rappler.com/brandrap/tech-and-innovation/104434-sme-digital-edge>. [Accessed: 28-Jan-2019].
- [12] K. Kenny *et al.*, “5 Essential POS System Features for Small Businesses - PSST! PH: Your Featured Online Lifestyle, Entertainment, News and Technology,” *PSST! PH: Your Featured Online Lifestyle, Entertainment, News and Technology*, 30-Apr-2018. [Online]. Available: <http://www.psst.ph/5-essential-pos-system-features-small-businesses/>. [Accessed: 28-Jan-2019].
- [13] O. C. Enteria and M. S. Role, “Education Management and Information System (EMIS) for Public Elementary Schools,” *int.jour.sci.res.mana.*, vol. 6, no. 06, Jun. 2018.
- [14] G. W. Ryan and H. R. Bernard, “Techniques to Identify Themes,” *Field methods*, vol. 15, no. 1, pp. 85–109, Feb. 2003.
- [15] S. E. Phelan, “What Is Complexity Science, Really?” *Emergence*, vol. 3, no. 1, pp. 120–136, Apr. 2001.
- [16] “Importance of Inventory Management Systems,” *Bizfluent*. [Online]. Available: <https://bizfluent.com/about-5518506-importance-inventory-management-systems.html>. [Accessed: 28-Jan-2019].
- [17] J. Simpson, “Tracking Your Marketing Efforts: Why It’s Important and How to Start,” *Forbes*, 06-Oct-2017. [Online]. Available: <https://www.forbes.com/sites/forbesagencycouncil/2017/10/06/tracking-your-marketing-efforts-why-its-important-and-how-to-start/>. [Accessed: 28-Jan-2019].

#### ABOUT THE CONTRIBUTOR

Giuseppe C. Ng is faculty member of the IST Department of the University of Asia and the Pacific. He has 11 years of experience in the IT industry.