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# Risk Assessment of Sustainable Renewable Energy Resources on CPEC Route

<sup>1</sup>Mustafa Zahid Baig & <sup>2</sup>Mirza Jahanzaib

## Abstract

China and Pakistan have collaborated to start the project China Pakistan Economic Corridor (CPEC). Major part of this project is the formation of different special economic zones (SEZs) to boost industrial growth. Additional energy plants would be required once these zones are set up. As the world is shifting its trend towards renewable energy, therefore major focus will be on risks related to renewable energy. Literature was studied, different risk factors were identified and risk solutions/measures were also identified. In the second phase, three renewable energy technologies. The main method used for research was Multi Criteria Decision Making (MCDM) through the Analytic Hierarchy Process (AHP) tool. Expert Choice software was used based on AHP structural concept. Pairwise questionnaire was formed while data were collected through three groups consisting of government officials, company representatives and officials and end users. The high risks were identified as a result according to each group and the risk solutions. The results provided priority of risks which were most important according to each group. The solutions were also ranked as identified by each group. The results obtained from second phase indicated which renewable technology was most affected by each of risk factor. This risk assessment can provide overview to government and investors about different risks. The evaluation of results and taking necessary steps can reduce these risks and provide better business and working conditions for this industry.

**Keywords:** *Risk Assessment, Renewable Energy, Multi Criteria Decision Making, Analytic Hierarchy Process*

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## About the authors:

<sup>1</sup>Department of Industrial Engineering, UET Taxila, Pakistan

<sup>2</sup>Department of Industrial Engineering, UET Taxila, Pakistan

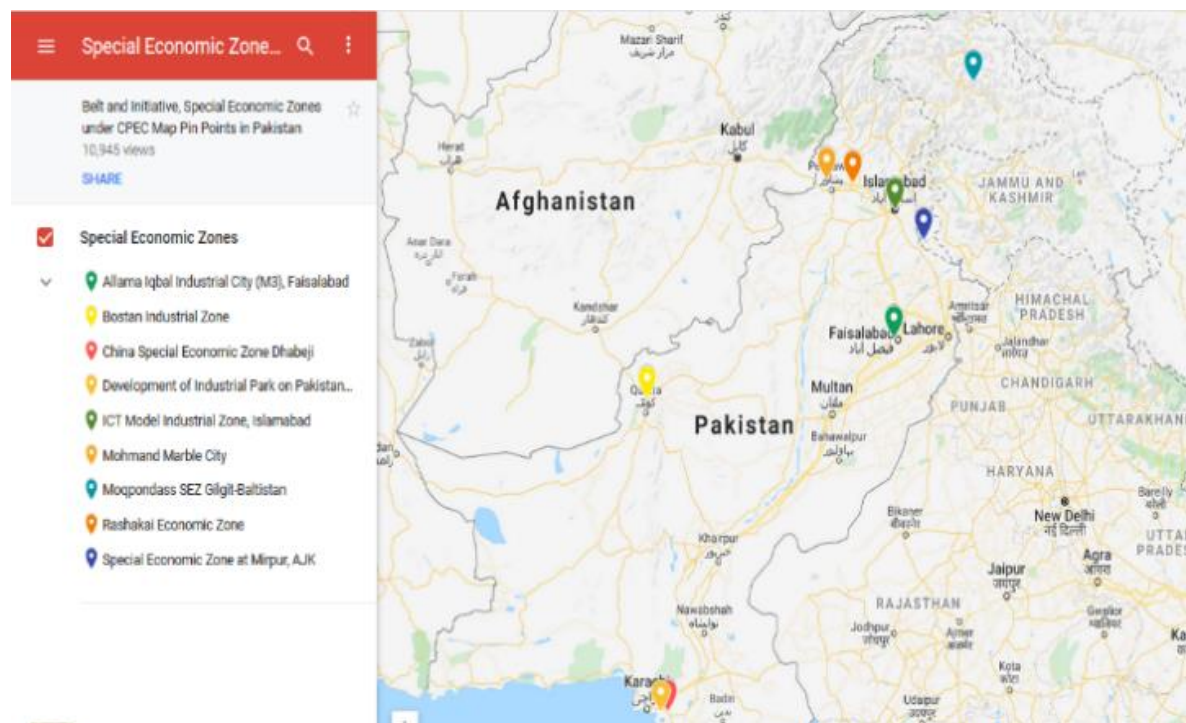


## 1. Introduction

The China-Pakistan Economic Corridor (CPEC) is a project that has been intimately started by both the governments. It involves a major investment in different fields like infrastructure, power and energy projects, among others. CPEC includes formation and development of different cities as economic zone. An economic zone is a vicinity in which the production and traffic laws are different from rest of the country (Shah & Rasheed, 2020). If efficiently executed, these projects will certainly enhance the economy of the country. Under CPEC, different cities were designated Special economic zones (SEZs) to focus on the industrial development. These zones will be center of attention for the investors and industrialists. It would help produce large number of jobs and strengthen the economy of Pakistan. These economic zones include Rashakai (KPK), Dhabeji (Sindh), Bostan (Baluchistan), Faisalabad (Punjab), Islamabad, Karachi (Sindh), Mirpur (AJK), Mohmand (KPK), Moqpondass (GB) (Khan & Anwar, 2016). These economic zones are presented in figure 1.

**Figure 1**

*CPEC Special Economic Zones SEZs*



Source: Google Maps Image

Among the many opportunities for economic growth, power sector has a big potential in CPEC zones in terms of transforming the transpiration project into an opportunity for clean energy generation. By 2019, almost 10,000 MW of production capacity has been increased and this number is expected to be around 16,000 MW when CPEC project will be completed in 2030 (Sheikh et al., 2019). These SEZs that will be developed in the near future, will certainly require power generation plants to operate smoothly, as new industries mean more power consumption. To fulfill needs of these economic zones, focus will be to utilize the renewable energy resources available in Pakistan (Solangi et al., 2019). Around the world, focus on renewable power generation and energy resources has increased rapidly (Kamran et al., 2020). Nations around the globe, are now investing more and more on these sources for their energy generation and more sustainable and pollution free environment. Pakistan has great potential and conditions for renewable energy but it has not been utilized properly. The major portion of power plants in Pakistan comprises of thermal energy (mostly coal based). Focus on the thermal fossil fuel has caused Pakistan to rank the seventh in Global climate risk index (Kreft & Eckstein, 2014).

The major renewable energy resources under consideration are wind, solar and micro hydel. The solar power capacity is estimated to be the most around 2900 GW (Rauf et al., 2015). The solar power capacity generally refers to the maximum output (production) of a power plant. The weather is hot in Sindh and Baluchistan provinces, which make them suitable for solar projects. Same is the case for wind energy, which has an estimated capacity of 346 GW and the Sindh and Baluchistan provinces are most suitable due to the coastal regions (Bhutto et al., 2013). The micro hydel resources are mainly situated in KPK and some areas in Punjab. As the most potential is in KPK therefore many projects are under consideration, total estimated capacity for micro hydel is around 1500 MW (AEDB, Ministry of Energy, Power Division). The rapid installation of renewable energy alternatives means that there will be number of risks which will be encountered and faced by stake holders. These risks should be analyzed in context of the real-world situations in CPEC zones. In this study, the risks associated with the energy projects in CPEC zones including wind, solar and micro-hydel power plants will be analyzed to recommend scientifically reinforced national policies. The risks can be technology related, financial, political and social, among others.

The wind, solar and micro hydel projects each have their own risks. As the projects will grow, the risks related to them will also increase. These risks can cause different problems for the

developers and stake holders. This research study provides the assessment of risks related to the renewable energy resource for the CPEC zones. Based on those risks, specific policy or alternatives will be provided to overcome risks.

## **2. Literature Review**

### *2.1. Risk Factors*

In the study of Wing and Jing (2015), major risks are classified as the political, market, operational, credit, market and liquidity risks. These risks are mainly faced by the stake holders and investors. The study in MITRE Corporation, Risk Impact Assessment and Prioritization (2014), proposed that for renewable energy projects and wind projects, the classification of risks is done as business/strategic, legal/liability, sales/ market, operation/maintenance, regulatory/policy and counter party risks. Accordingly, each program or project can have different risks related to its nature and scope. These studies have been done according to related countries conditions. Another study conducted by Ioannou et al. (2017) to evaluate risks related to renewable energy resources resulted in the categorization of risks as technological, environmental, political, social and economic. Similarly, the study done by Franklin (2019) in India, risks are categorized as political, operational, market, liquidity and credit risks. The detailed study for European Union by Noothout et al. (2016) suggested nine identified risks while in a similar study in European Region on the policy risk and regulatory risks for the renewable energy resources conducted by Gatzert and Kosub (2016) basically categorized these risks into business, construction/completion, policy, regulatory, political, legal, maintenance, and counter party risks.

There are different concepts and definitions of risk. According to Aven (2012), the meaning of risk depends on the use which the projects go through. Accordingly, Ragwitz et al. (2007), applied the concept of risk on renewable energy in European region and indicated that major risks can be further divided into smaller categories such as financial, market, political and technological divided into administrative, resource availability, market risks, financial support system, planning risk, access to grid, complexity of support risk. In addition, Waissbein et al. (2013), in a United Nations (UN) study on the renewable energy, indicated risk factors to help policy makers and stake holders, which include power market risks, permit risks, resource and technology risks, social acceptance risks, counter party risks, grid and transmission risk, financial sector risks, currency/macro-economic risks, and political risk. Bature et al. (2018) developed a research

questionnaire developed for the bio energy sector to indicate and find the different risks present in process, which identified the risks as technological risks, weather risks, construction risks, political risks, operational risks and environmental risks. The study concluded that as the project proceeds, it would grow more complex and the risks will also be more complex.

The number of power companies including the renewable energy resources is growing day by day. According to Segal (2011), the Enterprise Risk Management (ERM) process includes the several risk factors, which have factors like risk identification (categorization, definition, qualitative assessment, identification), risk quantification, decision making regarding risk and in the end risk messaging. This is supported by the analysis conducted by Mirkheshti and Feshari (2017) for the renewable energy projects which included offshore wind projects in Iran using the AHP method. According to the PMBOK, each risk should be considered by the four points: affect/impact, frequency, likelihood/possibility and time period. As the study utilized these variables with cost and quality to perform analysis, the risks identified were strategic/business risks, legal/liability risks, sales/market risk, transport and construction/ completion risks, counter party risks, operations/maintenance risks and political/policy/regulatory risks.

The study on sustainable energy system planning by Michelez et al. (2011) revealed that probability and variance can be used to measure the risk factor where as MCDM approach can be used for the non-statistical parameters. The study classified risk factors and their sub categories into political (country, regulatory and bureaucracy), social (lack of public surety and acceptance, major health risks), legal (energy and climate policy), economic (market, financial, business), technological (project development, construction, operations, infrastructure, decommissioning) and environmental. The study of Santoyo and Azapagic (2014) on sustainability assessment of the energy systems used life cycle approach to determine the most sustainable option. Methods like life cycle costing (LFC), life cycle assessment (LCA), scenario analysis, social sustainability assessment (SSA) and MCDM were utilized. Accordingly, Guerrero et al. (2016), in the Dominican Republic for the renewable energy resources, used the different methods such as Delphi method and check list to mark and identify the risks. SWOT analysis was also used which identified as price risks, technical risks and financial risks. AHP was used to prioritize the risks.

According to Gatzert and Kosub (2016), the risks are dependent mainly on the drivers and the policies, categorized as to costs related to grid management, size and type of financial support provided, controlling mechanism, national and regional targets, moral hazard, risks of acceptance,

political uncertainty and institutional determinants. This clearly illustrates that policy risks are very important part of the renewable energy projects. In this context, Shapiro and Koissi (2015) indicated that there are different methods used for the assessment of the risk on basis of fuzzy logic. These include quantitative and semi-quantitative methods and approach. But the fuzzy approaches were found to be more time consuming if seen from data collection end but they are more intensive and for solutions, results and decision making. According to Ioannou et al. (2017), the renewable energy has been in the spotlight for the researchers in the recent years. As few studies were conducted on these topics, risks related to Pakistan as possibly good location for renewable energy is of great interest for researchers. For instance, Beltrán et al. (2014) indicated different risk factors in the selection of solar thermal power plants in different investment projects which are political, economic, technical, market, financial and time delay risks. Similarly, Jin et al. (2014) on wind power market and industry in China, indicated several risk factors projects have to face such as policy risks, investment risks, marketing risks, design risks, operational and ecological risks.

In another study, Liebreich (2005) indicated several risks for renewable energy projects and their financing categorized as operational and maintenance, legal, technical risk, construction risks permit risks. Meanwhile, Jinrong and Enyi (2011) conducted a study on Energy Performance Contracting (EPC) and identified risks which could occur in EPC projects as market risk, technology risk, legal and political risk, financial risk, management risk, quality risk and client risk. In addition, Prostean et al. (2014), the wind power projects in China have different risks such as construction, transportation, quality risks, order fulfillment risk. Risk assessment done by Chebotareva et al. (2020) on renewable energy projects in Russia indicated different risks for projects as grid access risks, administrative risks, political risks, financial risks, technical and managerial risks and risks of public acceptance or social risks. While Wu et al. (2019) mentioned that renewable energy projects along the China's project Belt and Road initiative have mainly political risks, technical risks, economic risks, social and environmental risks and resource risks, Agrawal (2012) indicated that different risk factors in renewable energy projects are market, construction, performance, credit, financial, legal, regulatory and political risks.

Table 1 provides the various risk factors/criteria identified from the literature.

**Table 1***Risk factors/criteria*

<b>Risk Factor (Criteria)</b>
Political Risk
Financial/Economic Risk
Operational/Maintenance Risk
Market/Sales Risk
Technical Risk
Policy/Regulatory Risk
Social Risk
Legal/Liability Risk
Environmental Risk
Construction/Transport Risk
Counter Party Risk
Management/Administrative Risk
Resource Risk
Strategic/Business Risk
Grid Risk
Permit Risk

*2.2 Risk Mitigation/ Alternatives*

According to Wing and Jin (2015), renewable energy investors and developers perform their own initial assessments of the project regarding the finances and risk that can occur. As large amount of time and capital is invested, therefore this initial assessment is necessary. The developers can then deduce amount of loss and setback their company can take. However, they are dependent on the policies and regulations of the government. Decisions of the government will have direct impact on their projects. Therefore, they expect the government to cooperate with them and derive investor friendly policies to reduce the risk factor. This is supported by Noothout et al. (2016) that government action can have effect on the renewable energy projects and help the companies in improving their finances. The government can improve the relation between public sector and private institutions to create better research and development. The collaboration will help in the risk sharing between government and companies. If unfortunate that some project faces set back, the government is there to support the company.

According to Liebreich (2005), the insurances and subsidies provided by the government have very principal support on the renewable energy projects. The only form of risk reduction acceptable for investors is the insurance. The insurance from government safeguards the investors and their capital. As Noothout et al. (2016) states that different renewable energy projects can help the government in strengthening the economy of a country, the government therefore provides different insurances and subsidies to the companies. The different methods of production of electricity have different costs (Gatzert & Kosub, 2016) wherein the government can provide subsidies to renewable technology which can reduce the cost of hardware required for the projects and eventually increase the profits for the investors.

According to Noothout (2016), the involvement of government can reduce the risks to very extent in financing sector. The government connection with private organizations can be very helpful for projects. The government can also provide loan guarantee as well as credit facilities to the investors. The proper implementations of the regulations ensure project safety for the investors and equity providers. Accordingly, Waissbein et al. (2013) states that banks play an important role in providing assistance to project developers and investors in securing funding and capital. For this, Frisari and Micari (2015) suggest that multifarious banks are present that can provide loans to the development organizations to ensure complete successful running of the projects. This ensures the financial security for the organizations and helps them decrease the risk at much lower cost.

According to Agrawal (2012), there are many multilateral organizations and agencies which provide political risk insurance for the investors and developers. These agencies ensure safety of capital and provide services for proper transfer of currency. In many instances, Frisari and Micari (2015) asserts that government itself provides the political risk insurance to investors as it is directly responsible for political and economic condition of a country. As the government is directly involved, these guarantees are very effective in satisfying development firms and investors.

Noothout et al. (2013) explains that best strategy is risk sharing by government, in acquisition of permits and lands. The Not in my backyard (NIMBY) mentality makes people in favor of the renewable energy projects but are not ready to provide land for projects. Awareness and information campaign can be started to remove any misunderstanding regarding renewable energy projects with proper communication. The government can provide financial support to the



legal landowners to reduce the risk. As Soflaei et al. (2017) suggest, the strategy for the acceptance risk includes a proper campaign by the government to develop a consensus among general population regarding renewable energy projects.

In summary, table 2 lists the alternatives/ risk solutions obtained from literature.

**Table 2**

*List of Alternatives/ risk solutions*

<b>Risk Mitigation/Solution (Alternatives)</b>
Government Collaboration (Risk Sharing)
Government Insurance & Subsidies
Political Risk Insurance (PRI)
Financial Reforms & Contracts
General Awareness Campaign
Business Diversification
Risk & Security Consultants
Better ROI

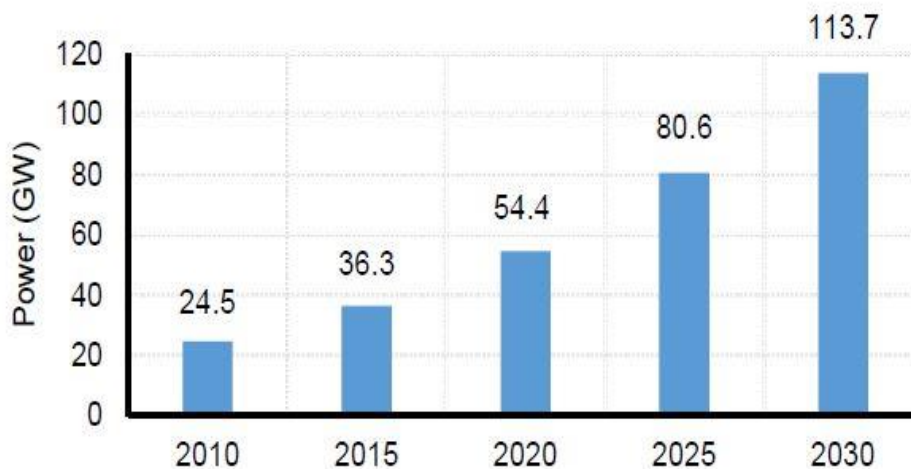
### *2.3 Renewable Energy Resources in Pakistan*

#### *Solar Energy Resource*

The energy demand in Pakistan is growing at a rapid rate of about 8% annually (Rehman & Deyuan, 2018) which is quite high. The nature of solar power is distributive which can be used to overcome the shortage. According to the Renewable Energy Attractiveness Index (RECAI) report in October 2017, Pakistan is included in top 40 countries which are suitable for renewable energy development. The solar utilization in Pakistan is so far not very good because the country has not properly utilized its potential for development of solar power energy plants (Rafique et al., 2020). According to some reports, the solar capacity in Pakistan is at around 2900 GW (Rauf et al., 2015). The increase in demand of solar energy can be seen in figure 2.

**Figure 2**

*Increase in demand of power projection*



*Source: Rafique et al. (2020)*

The geographical location of Pakistan allows each part of country to utilize different solar technologies and generate power. As Pakistan is very rich in solar potential, half of the country can be used to develop major power plants for energy. For instance, Baluchistan has the most solar potential followed by Sindh and Punjab. Major part of Pakistan's population is associated with the agricultural sector therefore their power needs can be fulfilled by using solar power (Yazdani & Pascale, 2017). The world is shifting its trends towards the renewable energy because by 2035 the fossil fuel production of energy will be greatly reduced due to depletion of sources. Therefore, it is inevitable to look for other sources of power production, which renewable energy will provide and fill that gap.

#### *Wind Energy Resource*

Over the last few decades, the world has progressed showcasing the growth in every field sector and increased dependency on technology. Thus, there is need for more energy and power to fulfill. The population of Pakistan has also increased in the past years which requires more energy generation. The conventional methods of energy production like oil, fossil fuel, and coal are covering majority of production in Pakistan. But as these sources deplete, there is a need to look

for other sources for energy production (Opricovic & Tzeng, 2004). There is huge potential for wind energy in Pakistan. According to reports, the wind site in Pakistan Gharo-Keti Bandr alone has potential to produce around 60 GW of energy and US Aid reports suggest that total potential is about 150 GW. There are few projects related to wind power that are producing energy. The coastal regions of Sindh and other North-West regions are suitable for the wind power. It is also important that these plants be set in 12-18 months and ready to be used where conventional methods like dams can take 5-6 years (Linkov et al., 2004).

### *Micro Hydel Resource*

The growing need of energy in Pakistan is one of major problems of country. The high growing population and new developing areas are causing shortage of power. Due to this, there are new and cleaner ways of producing power being utilized. One of them is micro hydel plants. Hydro plants produce clean and efficient energy. These can be considered as source of greatest renewable energy production throughout the world. One of major advantage of micro hydel is that it can be used in small streams and rivers where water flows and doesn't require storage of water. Micro hydel plants can range from kilo watts to few megawatts (Linkov et al., 2004). Accordingly, there is potential of about 1200 MW that can be produced using micro hydel in Pakistan but only 4-5% is being generated. Therefore, by using micro hydel as major source of power production, the short fall of energy can be overcome (Umer & Hussain, 2015).

## **3. Methodology**

Multi criteria decision making (MCDM) tools have wide range of use. These are applied in various fields whenever there are multiple alternatives with different selection criteria and factors. These are known for solving real complex problems due to their potential to select alternatives with reference to different criteria. There are different techniques in MCDM used for the problem solving which are Analytic Hierarchy Process (AHP), Weighted Product Model (WPM), VIKOR, ELECTRE and Multi Attribute Utility Analysis (MAUA) (Emovon, 2020). The first step in the MCDM approach is to set different objectives for the achievement of overall objective. In this study, the main objective is the risk assessment of renewable energy resources. The risk factors are the overall criteria and their mitigation techniques are the alternatives. These criteria and set of alternatives are important part of MCDM (Saaty, 1990).

The main procedure involves the risk factors labeled as criteria. The stakeholders including the government officials, renewable energy firms and organizations and end-users select the criteria/risk factors according to their own preference. They assign weight to each factor according to its importance and level of occurrence. These weights decide which risk is more likely important in the eyes of decision-makers. The next step is the selection of alternatives or risk solutions. The alternatives are ranked according to the stakeholders and the alternative with highest ranking is selected as best risk mitigation alternative. The AHP was used in this study. It is a process in which problem is divided into different levels. At each level, the factors are compared to each other in the form of pairwise comparison matrix. The factors of certain level are compared to adjacent level factors which generate set of weights or priorities. These weights are values which are assigned by the decision makers. The further solution of problem is done on basis of these weights (Saaty, 2014).

#### *Analytic Hierarchy Process (AHP)*

The AHP is used in MCDM and has been applied to many decision-making to solve practical problems. According to Lee et al. (2001), it is easy to choose by providing a very structured multi-criteria framework to evaluate the alternatives. AHP enables decision-makers to analyze qualitative and quantitative data using multi-criteria analysis. It also utilizes simple hierarchy structure which is easy to use for decision makers (Marle & Gidel, 2012). According to Saaty (1980), whenever there are large number of alternatives and selection factors are present, they can be analyzed using AHP. It is a powerful decision-making tool that can help decision makers deal rational and irrational data. It uses MCDM approach in which decision makers can evaluate several criteria and alternatives at the same time with the support of feedback and trade-offs. It also helps in simplifying the complex problems and converting them into natural decision-making. AHP is a technique designed to evaluate complex problems and break those complex problems into 4 steps which consist of hierarchy construction, the pair-wise comparisons, generating priority vector and synthesis.

The first step of AHP is to construct a structural hierarchy. This helps in solving decision problem. This step does not contain a certain rule which needs to be followed in constructing a hierarchy. The hierarchy, in descending form, contains the main objective or goal, followed by criteria, and sub criteria. The main part is to brainstorm objective, criteria and alternatives and then form hierarchy in which lower-level elements are compared with higher level elements.

After establishing the hierarchy, next step is to make priorities for criteria and alternatives included in the hierarchy. The AHP utilizes technique of pairwise comparison between the elements. The first step is to compare elements against the given criteria. The comparison of elements in the lower levels is done with respect to each element present in upper levels. The nine-point is used in this step.

The relative rankings of each hierarchy level are obtained by pairwise comparisons. The number of matrices is related to number of elements present at each level of hierarchy. The order of matrix depends on the links of elements on lower level. After constructing all the matrices, the next step is to calculate max eigen value ( $\lambda_{max}$ ), relative weights or global weights of each matrix (Saaty, 1990).

The first word in AHP is Analytic, which means dividing or separating material into its parts. Whereas synthesis is complete opposite of it, it means to combine or form new part. According to Saaty (1980), it consists of the following three steps.

The primary step in synthesis is to sum the values of each column in pairwise comparison matrix. This is followed by dividing each column value with the column total sum resulting to the normalized pairwise comparison matrix. In the next step, the average of rows on normalized matrix is obtained by adding and then dividing the average value with the number of entries in each row. In this way, relative priorities of elements are obtained.

To develop overall priority for ranking, synthesis is used. The ranking of alternatives depends on composite weights, which are developed by using relative weights of elements at different level.

The decision-makers' consistency is very important in every decision. The consistency of judgments in the pairwise comparison matrix can be checked. According to Saaty (1990), it is very difficult to achieve overall good consistency. In AHP, the inconsistency in hierarchy is checked. The acceptable amount of inconsistency ratio is 10%, or anything less than this. Any value higher than this is not acceptable (Saaty, 1990).

The following are used to measure consistency: Weighted Sum vector (W), Consistency Ratio (CR), Consistency Index (CI) and Ratio Index (RI).

w is obtained by using following equation:

$$D.w = \lambda_{\max}.w$$

Where D is pairwise comparison matrix,  $\lambda_{\max}$  is the eigen value of matrix D and w is right eigen vector.

According to Saaty (1990), consistency consists of following steps:

1. The relative weight or eigenvector and  $\lambda_{\max}$  for each matrix is calculated in order n.
2. The consistency index (CI) is calculated using the formula:  $CI = (\lambda_{\max} - n) / (n - 1)$
3. Consistency ratio (CR) is calculated using the formula:  $CR = CI / RI$

Generally, if the CR value is less than 10% it is acceptable; higher than 10% the judgments should be rechecked and done again. If the consistency index of entire hierarchy is to be obtained, the CI of each matrix is multiplied by priority of criteria. The consistency of entire hierarchy can also be checked by comparing CI of hierarchy with random CI of matrices of same size. If CR is less than 10%, it is good and acceptable; higher than 10% then judgments should be reviewed and rechecked (Badalpur & Hafezalotob, 2015).

4. AHP Analysis. According to the cited literature, the number of criteria and alternatives were identified. However, the number were large, which is impossible to use for pairwise comparisons. Therefore, the team of experts were presented with the first questionnaire, which they selected the 7 most important criteria and 5 most important alternatives. Table 3 presents the criteria and alternatives used in the risk assessment.

**Table 3**

*Selected criteria and alternatives from literature*

Criteria/Risk Factors	Alternatives
Political	Government Collaboration (Risk Sharing)
Financial/ Economic	Government Insurance & Subsidies
Operational/ Maintenance	Political Risk Insurance
Market/ Sales	General Awareness Campaign
Technical	Financial Reforms & Contracts
Policy/ Regulatory	
Social	

As the procedure of MCDM was used, the AHP was also applied. In applying AHP, the hierarchy is established first. Using the framework of AHP, the hierarchy was constructed using the factors and alternatives derived from the literature. The first hierarchy is presented in figure 3.

**Figure 3**

*Derived Hierarchy*



The second hierarchy was also constructed using the same risk factors/criteria but with different alternatives which are renewable resources. The data were collected related to the risk factors to renewable energies with risks. The second hierarchy is presented in figure 4.

**Figure 4**

*The Second Derived Hierarchy*



The questionnaire was developed using the selected criteria/factors and alternatives from the hierarchy. The main purpose of this questionnaire was to obtain expert judgement regarding the research objectives. The questionnaire consisted of pairwise comparisons of criteria and alternatives. It also contains a cover letter which explained the steps and procedures on filling out the questionnaire and the use of data in the study. The language of the questionnaire was kept

simple to be comprehensible. It contained the following: preliminary information about the questionnaire, pairwise comparison of criteria/risk factors, and the pairwise comparison of alternatives with respect to each criterion. The questionnaire was based from the data collected from literature, which were factors and alternatives.

A total of 74 questionnaires were distributed, out of which, 71 were retrieved from the participants, 8 were returned with inconsistent answers, which were discarded. The 71 experts comprising 17 end-users, 28 government officials from different regions and 26 renewable energy company officials operating in different regions were the participants of the study. The demographic profile of the participants showed that majority of them are majority of them are 20-30 years old (N=29) and 31-40 years old (N=28), male (N=47) with 2 – 5 years' work experience (N=25).

The major advantage of AHP is that, it does not require large statistical sample size to obtain good results (Doloi, 2008). According to some researchers, AHP is a subjective method which only focuses on issue, which does not require large sample. Others argue that in AHP expert judgments matter so even one qualified expert judgment can be represented as final. It can also be used in studies with large sample size, but if cold experts provide unpredictable answers, it could affect the consistency of data (Cheng et al., 2002).

#### 4. Results & Discussion

Table 4

*Results of pairwise comparison of factors & their ranks. (first hierarchy)*

Criteria/Risk Factors	Government Officials		Company Officials		End Users	
	Priority	Rank	Priority	Rank	Priority	Rank
Political	0.201	2	0.164	4	0.175	3
Financial/ Economic	0.224	1	0.179	3	0.220	2
Operational/ Maintenance	0.147	4	0.258	1	0.119	4
Market/ Sales	0.104	5	0.081	5	0.233	1
Technical	0.102	6	0.200	2	0.097	5
Policy/ Regulatory	0.183	3	0.080	6	0.069	7
Social	0.039	7	0.037	7	0.086	6



Table 4 shows the pairwise comparison of the first hierarchy for three groups of respondents. The results indicate the rankings of the criteria/risk factors accordingly as financial/economic (government officials), operational/maintenance (company officials) and market/sales (end-users).

**Table 5**

*Results of pairwise comparison of alternatives & their final ranks. (first hierarchy)*

Alternatives	Government Officials		Company Officials		End Users	
	Priority	Rank	Priority	Rank	Priority	Rank
Government Collaboration (Risk Sharing)	0.299	1	0.296	1	0.266	1
Government Insurance& Subsidies	0.245	2	0.260	2	0.236	3
Political Risk Insurance	0.144	4	0.151	4	0.152	4
General Awareness Campaign	0.078	5	0.075	5	0.089	5
Financial Reforms & Contracts	0.233	3	0.219	3	0.247	2

Table 5 shows the result of alternatives pairwise comparison and their rankings for the first hierarchy. The pairwise comparison of alternatives showed government collaboration (risk sharing) at rank 1.

**Table 6**

*Results of pairwise comparison matrix (2nd hierarchy)*

Criteria/Risk Factors	Priority	Rank
Political	0.244	1
Financial/ Economic	0.183	2
Operational/ Maintenance	0.095	6
Market/ Sales	0.083	7
Technical	0.136	4
Policy/ Regulatory	0.157	3
Social	0.101	5

Table 6 shows the second hierarchy results of pairwise comparison. The second hierarchy showed political factor at rank 1 and financial/economic at rank 2.

**Table 7**

*Results of pairwise comparison of alternatives & their final ranks. (2nd hierarchy)*

Alternatives	Priority	Rank
Solar	0.433	1
Wind	0.327	2
Micro Hydel	0.239	3

Table 7 shows the results of the second hierarchy pairwise comparison of alternatives. The results showed solar at rank 1 followed by wind and micro hydel at ranks 2 and 3, respectively.

### ***Discussion***

The government officials identified financial/ economic, political and policy/regulatory as the most important risk factors with high chances of occurrence. Meanwhile, the solutions were ranked as government collaboration, government insurance & subsidies and financial reforms and contracts. On the other hand, the company experts identified operational/ maintenance, technical and financial/ economic as the important risk factors while the alternatives or risk solutions were ranked as government collaboration, government insurance & subsidies and financial reforms and contracts. The third group of participants, the end-users, ranked risk factors as market/ sales, financial/ economic and political. The risk solutions or alternatives identified by this group were government collaboration, financial reforms & contracts and government insurance and subsidies. It can be observed that all three groups have almost same opinion for the risk solutions that the government factor is the key point in risk reduction mechanisms.

The political risk is identified as the most important risk factor by the three groups. Related literature and studies showed that political risk is identified as a factor in most risk management and assessment. Similarly, Waissben et al. (2013) identified political and financial risk as the most important factors. The second risk factor, financial/ economic, also confirmed the results of the previous studies while the other factors such as policy/regulatory, operational/ maintenance and market/sales risk affirmed the results of Franklin (2019), Gatzert and Kosub (2016), Noothout et al. (2016) and Ragwitz et al. (2007). Meanwhile, the results of Wu et al. (2019), Protean et al.

(2014) and Jin et al. (2014) mainly focused on political and operational/maintenance and technical risks.

The literature and studies as well as the results of the current study indicated that government support is the most important factor in risk reduction. Whenever the government backs the investors and ensures its support, the risks can be reduced and their chances of occurrence can be minimized. The studies within the European region identified government collaboration and government insurance and subsidies as important risk solution. It is true that the machinery of the government ensures all projects maintain their growth efficiently and are completed in time. As the same trend pattern was identified, all three groups of respondents (government officials, renewable energy company experts and end-users) have same opinion on risk alternatives. Therefore, government factor was identified as the most important. Financial reforms and contracts alternative is within the government jurisdiction.

## **5. Conclusion**

The study identified different risk factors that renewable energy projects can face in general. As the CPEC project is progressing, there is a need for more energy plants in regions along its route. The study also identified the solutions or measures necessary to eliminate or reduce these risks. Three groups of individuals served as participants, which include government officials, company officials and experts and end-users. MCDM approach through the Analytic Hierarchy Process (AHP) method was used in data analysis. The questionnaire was designed from cited literature and studies, which identified the risk criteria as political risk, financial/ economic, market/sales, operational/ maintenance, technical. policy/regulatory and social risk. Each group of participants identified the risks according to their importance and probability of occurrence, which were ranked based on their priorities. Similarly, risk solutions contained government collaboration, government insurance & subsidies, political risk insurance, general awareness campaign and financial reforms and contracts. The groups also identified the most important risk solution to reduce the risk identified in the first step. These solutions were also ranked on basis of their preferences.

The results showed that one of major risk factor is financial/ economic. Majority of the stakeholders are more concerned about financial and economic conditions of the country. Therefore, government should take steps in order to ensure good market conditions for business and investors. As they have also identified government collaboration as major risk solution, it means government's support for renewable industry needs to be more efficient. These can be done in form of different risk sharing and financial contracts in which government becomes the partner to boost the industry. Political risk was also identified as major risk factor. If political condition of country is not stable, foreign investors back out. Therefore, government should also provide insurances to investors and renewable energy companies to help them operate easily in changing political conditions. This will bring foreign investment and jobs for local industry. In addition, the government insurance and subsidies is one of major risk solutions selected by the experts.

The involvement of government in backing renewable energy projects should be maximum, as it would present better political image and attract more investors. The government has provided many facilities to renewable energy companies and investors in Alternative Renewable Policy (ARE) 2019, which include duty free import of plant and machinery for local industries. But these points can be improved in terms of more financial benefits and good financial and political situation on country.

The results of the current study showed similarity to many previous studies. Through this result, the important risk factors in the region were identified. These results can help government officials to derive policy and set their focus on better policies and regulations to help foreign investors and local manufacturers working in field of renewable energy technology. Further studies can be explored using the same method to identify different risks factors from other industry or technology.

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# Relationship of Succession Practices to Successful Leadership Transition

<sup>1</sup>Eric S. Parilla & <sup>2</sup>Joseph David Santos Jr.

## Abstract

The study measures how the level of implementation of the top ten succession practices according to literature affect the perceived level of successful leadership transition of selected multigenerational Filipino family businesses and whether their organization profile has a significant moderating influence on the relationship of the two variables. The study surveyed a sample size of 71 respondents, each belonging to their own family business, and interviewed 10 among the respondents in order to gain a deeper understanding on the results. The results suggested that there is a strong positive correlation between the level of implementation of succession practices and the perceived level of successful leadership transition of the selected multigenerational Filipino family businesses regardless of their organization profile. It was found that family businesses highly implemented succession practices relating to communication, but the definition of the responsibilities of the predecessor after transition and measuring the performance of the leadership position were least implemented. The incorporation of the vision of the company in the succession plan in such a way that decisions were made with the company vision in mind was also found to be the most positively significant factor that affected the perceived level of successful leadership transition.

**Keywords:** *family business, succession planning, succession practices, leadership transition*

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## About the authors:

<sup>1</sup>Corresponding author. DBA, FEB. College of Business Education, Northwestern University

<sup>2</sup>MScM. School of Management, University of Asia and the Pacific



## 1. Introduction

The Philippine economy has been thriving in recent years and has remained one of the fastest-growing economies in East Asia and the Pacific region (prworksph.com, 2020). What was once called the “sick man” of Asia has transformed into the “rising tiger” economy with an average growth of 6.2 percent in the last six years (Bloomberg, 2016). In 2014, the Philippines was second only to China as the fastest growing economy in Asia (CNN Philippines, 2015). Moreover, according to Alegado and Yap (Bloomberg, 2016), the Philippines has just posted the strongest economic growth in Asia at 7.1 percent.

Much of these economic contributions can be traced back to the basic unit of society, the family; more specifically to family businesses. In fact, at least 80 percent of all Filipino enterprises in the Philippines are family-owned (Inquirer, 2014). It is no secret that family businesses play a major role in the growth of the economy. According to Venter et al., (2005), family-owned businesses are one of the most significant contributors to wealth and employment creation in practically every economy in the world. Family businesses, in fact, employ around 50-70 percent of the world’s population (Poza & Daugherty, 2013). Unfortunately, most family businesses are short-lived. According to Williams et al. (2013), almost 66 percent of family businesses fail to transition to the second-generation, and only 15 percent survive until the third-generation. Moreover, a study shows that only 1/3 of family businesses make it to the second-generation, and roughly 1/3 of which reach the third-generation (Ghee et al., 2015). Unfortunately, the statistics decline even more which states that 95 percent of family businesses fail to survive the transition to the third-generation owners (IFC Corporate Governance, 2016).

This phenomenon leads to the need for the sustainability of family business through effective succession planning (Wee Yu Ghee et al., 2015). As stated by several scholars, sustaining a family business is perhaps the most difficult job because of the mix of business problems and family issues (Gomba & Kele, 2016; Lee, 2006; Ward, 2011). Unlike regular non-family businesses, family-businesses not only have to deal with regular business problems but family problems as well. Concerns such as power struggles, sibling rivalries, and nepotism, set-back family businesses from being sustainable and hinder their longevity as a business. Thus, this study aims to study multigenerational family-businesses that have had success in their succession planning practices and have experienced surpassing the issues attached to intergenerational leadership transition.

The study aims to assess how the level of implementation of succession practices of selected multigenerational Filipino family businesses have contributed to their perceived level of successful leadership transition. It investigated the profile of the different family business and assessed the level of implementation of succession practices. It also measured the moderating effects of organizational profile in the relationship of succession practices and leadership transition.

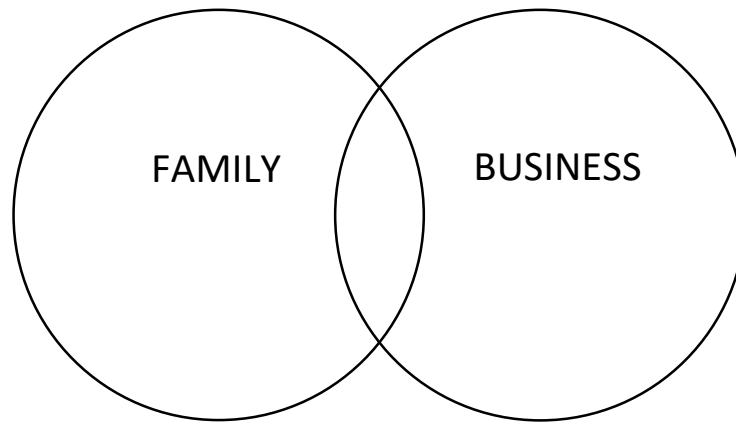
## **2. Literature Review**

### *2.1. Theoretical Framework*

Much research has been done on the subject of family business. The existing literature is quite broad and extensive. Many scholars in fact have dedicated their work to family business research because these businesses are not just important to the families that own and run them but also contribute to the world's economy. As cited by Peterson-Withorn (2015) from a study conducted by the Center for Family Business at the University of St. Gallen in Switzerland, family businesses account for eighty to ninety percent of firms worldwide and are the main source of job creation and GDP growth. There is no doubt about the significance of family businesses and because of the well-established fact that many scholars research and delve upon the topic of sustainability and continuity of family businesses. However, there are so many different variables being studied by various existing literature which makes the topic very difficult to navigate.

### *Systems Theory*

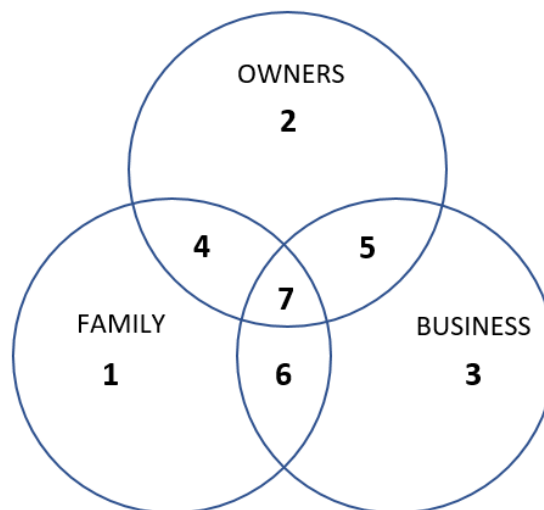
Several studies have established the concept of family businesses on systems theory (Wallace, 2010). This theory is rooted from the general systems theory pioneered by Ludwig von Bertalanffy in 1928 (Walonick, 1993). The theory states that a system is made up of the interrelation of its elements and that the interdependences between the elements influence each other and the system as a whole. In relation to the concept of family businesses, the family and the business are seen as two systems, however in such case these two systems overlap, turning into subsystems of the main system which is the family business. Miller and Rice (1967) state that the interaction between the two subsystems (family and business) is where issues and problems usually arise. This interpretation of the systems model of family business can be represented by the Two Circle Model as shown in figure 1.

**Figure 1***Two-Circle Model by Miller and Rice (1967)*

In existing studies, the two-circle model has often been used to focus on the negative aspect of the family business system. However, it has also been used to identify the positive side of family business characteristics such as closely shared values among member of the family who are also within the organization (Barret, 2014). This two-circle model however has been criticized by some researchers for ignoring or excluding other valuable elements or subsystems of a family business, which lead to the development of the Three Circle Model by Tagiuri and Davis (1982) as shown in Figure 2.

**Figure 2***Three-Circle Model by Tagiuri and Davis (1982)*

1. Family Members
2. Non-Family Owners
3. Non-Family Employees
4. Family Owners
5. Non-Family Owner Employees
6. Family Employees
7. Family Owner Employees



This three-circle model is commonly used by family business researchers. It adds another circle to the previous model (figure 1) representing ownership. Resulting from the overlap of the three circles are the seven interest groups involved in a family business system. Each of these interest groups introduce different contexts, characteristics, and ambitions. Davis (1982) states that the addition of the ownership circle or subsystem was an improvement of the two-circle model because it sheds light on the other issues which could not be explained by the previous model. The introduction of the ownership subsystem separated ownership from management as different subsystems in themselves. This separation of ownership from management caused the emergence of Agency Theory in the study of family businesses (Barret, 2014).

### ***Family Businesses***

When it comes to family business research, one must first understand the concept of the family. There are different types of families, may it be nuclear, single-parent, cross-generational, or dysfunctional. A family is a system in itself containing different elements which interact with one another. These elements are the members of the family. These individuals do not choose to be in the family, but are automatically included, unlike other groups which form a business (Schwass, 2013). All families have their own set of values which form their unique family culture (Deloitte, 2015). As mentioned by Lim (2016), the set of values a family embodies can be reflected in the way they do business. This makes family businesses unique. However, this intersection between the family and the business system is also where problems arise according to Miller and Rice (1967). In order to avoid carrying over problems from the family to the business, Houden (2016) mentions the importance of family harmony. As cited by Lim (2016) it is “*the ability to trust and support, communicate differences in a constructive manner and look beyond the self at a broader picture.*” Rust and Chung (2006) also mentions the benefit of forming trust-based relationships in order to mitigate inter-personal conflict, promote healthy relationships, and encourage familiarity with individuals.

Wrosch et al. (2011) mention that family businesses by their very nature are complex because of the need to balance the rigors of doing business within the complex relationships of the family. Similarly, Schwass (2008) explains that the complexity of family businesses is brought about by the intersection of family issues, business decisions, and ownership, which can actually be seen through the three-circle model by Tagiuri and Davis (1982). Moreover, Schwass (2008) adds that despite their complex nature, family businesses are capable and are often able to exceed

non-family businesses because of shared values and their inherent will to pass on the business to future generations.

Family businesses, like any other business also face problems. In fact, family businesses deal with more problems than regular businesses because aside from common business problems, family businesses also face family problems which affect the business as well (Schwass, 2013). Problems such as sibling rivalry, nepotism (Fu, 2015), maintaining non-family member loyalty, professionalism (Lim, 2016), and succession planning (Haag et al., 2006; Motwani et al., 2006; Miller, 2014; Schwass, 2013) are the very common. As stated by Schwass (2013) *“[i]t is statistically proven that generational transition is the highest risk for continuity and that the vast majority of families in business fail to deal with it.”*

### ***Succession Planning***

Quite a number of experts and researchers have identified succession planning as the most important practice for family business continuity. In order to execute a successful intergenerational leadership transition, a succession plan must be established. However, it is easier said than done. Scholars have been dwelling upon the subject of succession planning for family businesses and countless numbers of researches have already been made. Despite all the information that has already been derived from these researches, it begs the question as to why most family businesses still fail in intergenerational leadership transition. The answer lies in the complexity of the problem. Several variables impact the succession process such as communication practices (Haag et al., 2006), size of the firm (Motwani et al., 2006), predecessor or successor related factors (Chitoor & Daas, 2007), shared vision and family climate (Miller, 2014), organizational culture (Fancher, 2007) and many more.

A study conducted by Perrenoud (2012) analyzes seventy existing literature on the best practices related to succession planning. From his analysis, he had identified recurring themes from which he had extracted the top ten best practices for succession planning. The top ten recommended practices for succession planning with their corresponding frequencies are listed in Table 1.

**Table 1***Top Ten Recommended Practices for Succession Planning*

#	Recommended Practice	Recommendation Frequency
1	Prepare a succession plan	100%
2	Analyze and select quality candidates	73%
3	Prepare a plan to develop successor	64%
4	Prepare well defined/communicated responsibilities	50%
5	Secure senior level support	50%
6	High level of communication	50%
7	Talent management processes in company	41%
8	Capture the vision of company	36%
9	Measure performance before and/or after succession	36%
10	Agreed responsibilities of predecessor after transition	36%

Each of the ten recommended succession practices are discussed below based on the study by Perrenoud (2012):

*Prepare a succession plan.* Preparing a succession plan, among all other recommended practices, is the only recurring practice found in all the seventy articles reviewed. Often these plans begin informally but slowly develop into a formal plan which typically includes a timeline, and the procedures as to how the successor will be selected, trained, and finally appointed. Succession plans are also executed by businesses in order to minimize the risks involved in the transition. Multiple researches have shown that companies that have prepared a succession plan are more likely to succeed in their leadership transition compared to those who do not (Bhen et al., 2005). However, as cited by Perrenoud from SFGate (2011), the study found that out of 1,318 CEO executives, only 35% had a succession plan.

*Analyze and select quality candidates.* In order to find the best candidate for the leadership position, potential successors must first be selected and evaluated. During this process the vision of the company must be considered to find the best match for the company. A company is not limited to appointing internal candidates from within the company. Instead, external candidates can also be considered for the position (Miles & Bennett, 2007).

*Prepare a plan to develop successor.* The candidates for succession must be developed in order to prepare them for the leadership role. The development programs commonly used by human resource departments (Berntal and Wellins, 2006) include: formal workshops; special



projects within one's own job responsibilities; articles/books; tests, assessments or other measure of skills; coaching with internal coaches or mentors; special projects outside of one's own responsibilities; computer based learning; coaching with external coaches or mentors and expatriate assignments.

*Prepare well defined/communicated responsibilities.* The predecessor must have well defined expectations of the successor. The successor must be made aware of these expectations and freely accept the roles and responsibilities expected of them.

*Secure senior level support.* Top management must acknowledge the need for succession planning and must also be involved in the planning process. Without senior level support the succession process may be ineffective.

*Talent management process on company.* According to Hartley (2004) as cited by Perrenoud (2012), talent management involves "recruiting, on-boarding, and developing, as well as the strategies associated with those activities in organizations." A well-developed talent management process promotes a culture of succession which inspires employees to develop in order to progress their careers. According to Chavez (2011), developing leaders from within the company is very important because companies which fail to do so are not only at risk of losing valuable knowledge and experience when the time comes for senior management to retire, but are also likely to suffer from lower productivity due to the lack of employee engagement. The longer the time is spent on developing successors, the more prepared they will be in assuming a leadership role for the company.

*High level of communication.* Ibrahim (2001) states that leadership transition within small or family organizations often experience a breakdown in communication. As suggested by Perrenoud (2012) the lack of communication is often an indicator of the lack of trust between the predecessor and the successor. A high level of communication is ideal to promote good relations between the transitioning parties and smoothen the succession process.

*Measure performance before and after.* Performance metrics measuring the progress and performance of the talent management process can make the selection of potential candidates easier (Chavez, 2001; Bernthall & Wellins, 2006; Grove, 2006). After the transition on-the-other-hand, performance metrics is crucial in evaluating the success level of the transition. A study by Dalton (2006) states that within eighteen months after the transition, 40% of CEO's fail. For this reason, measurable metrics are important in evaluating the successors first year of performance (Miles & Bennet, 2007).

*Capture the vision of the company.* In the early stages of succession planning, the vision and strategic goals of the company must be considered in order to know what type of future leader it needs to fulfill their objectives (Hadelman & Spitaels-Genser, 2005). The successor's alignment with the vision of the company and the predecessor must be considered during the selection process (Sharma et al, 2003). With the continuity in mind, a successor in line with the vision of the predecessor can build from what the incumbent has started (Sambrook, 2005).

*Agreed responsibilities of predecessor after transition.* The success of a transition relies heavily on the initiative of the predecessor to prepare a succession plan and to willingly step down when the time comes (Sharma et al, 2003a; Sharma et al, 2003b). As explained by Kirschner & Ungashick (2005) it is not true that predecessors must completely let go of control over the company when the successor assumes his role. With proper planning, the predecessor and the successor can agree to each other's roles and responsibilities in control of the company. However, in order to avoid conflict between them, each one's responsibilities must be clear and detailed (Sharma et al, 2003a).

### ***Hypotheses Development***

Hypothesis 1. There is a relationship between level of implementation of succession practices and level of successful leadership transition

The study by Tan (2009) investigates the leadership succession planning and implementation of Malaysian companies. Tan first compares the level of importance Malaysian companies place on leadership succession planning and implementation and analyzes it against the actual practices executed by the companies. After the leadership succession practices are known, he then investigates whether the implemented leadership succession planning enhance or inhibit the companies' leadership succession by causing CEO entrenchment or organizationally generated entrenchment. On the other hand, Burns (2014) examines the succession planning process of family-owned businesses as they attempt to transfer their business from one generation to another. The study does not only discuss the transfer of ownership but also the transfer of knowledge, expertise, and leadership transition. In her study, she also investigated the effects of the problems faced by the family-owned businesses. Both studies signify that there is a relationship of level of implementation of succession practices and level of successful leadership transition.

Hypothesis 2. There is mediating effect of organizational profile in the relationship of level of implementation of succession practices and level successful leadership transition.

A study by Magasi (2016) focuses on the factors that influence business succession planning among small and medium enterprises in Tanzania. It identifies demographic characteristics, business size, and family related factors as the major influencing variables to succession planning. The results from the study show that with a higher age of owners, there is a higher possibility for the business to prepare for succession. The study also pointed out that males have a higher chance of being the successor of the business. Moreover, the size of the business, the educational attainment of the top management, and the level of communication among members also show a positive relationship with the succession planning of a business. The increased involvement of family members in the business however was found to have no influence on succession planning.

### **3. Methodology**

#### *Research Design*

This descriptive study used mixed methods to provide a more in-depth analysis on the topic by supporting the gathered quantitative data with more descriptive qualitative information. Both survey questionnaire and semi-structured in-depth interview were done to collect data. The interview results were incorporated in the analysis of data.

#### *Population and Sampling*

According to Cruz (2019), approximately 80% of all businesses in the Philippines are considered family businesses although no exact number shown in any literature. It is noted however, that only 1/3 of family businesses make it to the 2<sup>nd</sup> generation (Ghee et al., 2015), and around 95% of family businesses fail to transition to the 3<sup>rd</sup> generation (IFC Corporate Governance, 2016). These facts have a big implication on the study since the target respondents are not just family businesses in general but only those in which have undergone intergenerational leadership transition, which makes it even more difficult or impossible to accurately quantify the exact size of the population. For the purposive sampling technique, multigenerational Filipino

family business are the specific target respondents. Multigenerational means more than one generation of the family is involved in the business. Since the study also looks at the perceived level of successful leadership transition, the family businesses must have also undergone a succession of a leadership role. For this reason, the study aimed to gather as many respondents as possible within the 4-month data gathering period and had managed to collect responses from 71 multigenerational Filipino family businesses, most of which were personal contacts of the researchers. Among the 71 respondents, 10 were interviewed further to gather more qualitative data.

The gathered profile of these businesses include: years of operation, number of family generations involved in the business, number of employees, number of family members involved in the business, and asset size. In terms of years of operation, the largest groups of respondents fall under 1-10 years of operation (25%) and 41 years and above (21%). Meanwhile, 75% of the sample (53 respondents) currently have 2 generations involved in the family business, followed by 17% (12 respondents) with 3 generations involved. Following the Magna Carta for Micro, Small and Medium Enterprises (RA 9501, 2008) on the standard classification for business size, most of the businesses are considered small with 10-99 employees (46%) and Php 300,001 - Php 15,000,000 asset size (35%). Furthermore, 75% of the businesses have 1-5 family members involved in the business.

### *Instrument*

The quantitative information was gathered via survey questionnaire and the qualitative information were obtained through the interviews. The questionnaire was based and modified from the study of Perrenoud (2012) on the “Effective Succession Planning of Construction Companies.” The first part of the questionnaire gathers the demographic profile of the respondents and the organizational profile of the family businesses. The second part focuses on the level of implementation of succession practices, and the last part aims to quantify the perceived level of successful leadership transition of the family business. A four-point Likert scale was adapted to rate the level of implementation of succession practices and the perceived level of successful leadership transition.

A semi-structured in-depth interview was also utilized in collecting more information from the respondents using their respective accomplished questionnaires. The respondents shared additional insights on their experiences during the leadership succession process.

### *Data Gathering Process*

The survey questionnaires were administered in two ways: personal administration and online means via Google Survey. Administering the survey personally involved handing the respondents copies of the questionnaires while administering online involved sending the link of the Google Survey via email or through social media streams. The semi-structured in-depth interviews were administered through face to face conversations, phone calls, video calls, or online conversation. The means of executing the interviews highly depended on the availability of the respondents. During the interview, aside from the written notes of the researcher, audio was also recorded and transcribed.

### *Data Analysis*

The statistical treatments used for this study were frequency, percentage, mean, Pearson's correlation, multiple regression, and SEM analysis. Frequency and percentage were used to analyze the demographic profile of respondents and the organizational profile. The weighted mean was derived from the answers provided by the respondents to each item pertaining to the perceived level of successful leadership transition and the level of implementation of their succession practices. Pearson's correlation was used in order to measure the relationship of the independent variable to the dependent variable. Moreover, the simple structural equation modeling (simple SEM) using Jamovi software was employed to estimate the parameters of the mediation model. A simple SEM is a multivariate statistical *analysis* technique that is used to analyze *structural* relationships. This technique is the combination of factor *analysis* and multiple regression *analysis*, and it is used to analyze the *structural* relationship between measured variables and latent constructs (D. Kaplan,2001). Moreover, GLM Mediation analysis was also utilized to further test the model. GLM mediation model estimates simple, multiple, and conditional mediation models with maximum likelihood regression.

## 4. Results and Discussion

**Table 1**

*Level of Implementation of Succession Practices*

<b>Indicators</b>	<b>Mean</b>	<b>Interpretation</b>
LISP1- Prepared succession plan in preparation for the leadership transition	2.72	MP
LISP2- Analyzed the competencies of the candidates and selected the one that would best fit the leadership position	2.82	MP
LISP3- Prepared a plan to develop the successor	2.83	MP
LISP4- Defined and communicated the responsibilities to the successor	3.03	MP
LISP5- Secured Senior level support for the transition process	2.85	MP
LISP6- Constant and open lines of communication between predecessor and successor	3.44	HP
LISP7- Implementation of talent management processes such as hiring, training, and promoting during the time of transition	2.70	MP
LISP8- Captured the vision of the company in the succession plan in such a way that decisions were made with the company vision in mind	2.92	MP
LISP9- Measured performance of the leadership position before and after transition	2.62	MP
LISP10- Agreed on the responsibilities of the predecessor after the leadership transition	2.62	MP

*Legend: 1.0 – 1.75 Not Practiced (NP); 1.76 – 2.5 Slightly Practiced (SP); 2.51 – 3.25 Moderately Practiced (MP); 3.26 – 4 Highly Practiced (HP)*

Based on table 1, on average the only succession practice which is highly implemented (3.44) by multigenerational Filipino family businesses is the constant and open lines of communication between predecessor and successor. A high level of communication was also found among the respondents of the study by Perrenoud (2012). This is important because a breakdown of communication between the predecessor and the successor hinders the succession planning process (Perrenoud, 2012; Handler & Kram, 1988). A common theme based on the interview responses of the study was that most of the predecessors and successors of the leadership succession of family businesses live in the same household and work closely together which makes communication easier as compared to non-family related individuals. The second most

implemented practice with a mean score of 3.03 (moderately practiced) was the definition and communication of the responsibilities to the successor. This result further strengthens the importance of communication in the succession process of the family business. As cited by Perrenoud (2012) from the work of Handler and Kram (1988), the delegation of responsibilities reduces the resistance to planning for succession. The interviews show that most of the successors already had an idea of their role in the business at a very young age because they were already exposed to the business and its functions early on. However, this was not the case for all. One interview respondent was still surprised by the sudden leadership transition and was not completely familiar with the specific responsibilities of his new leadership position in the business.

The seven (7) other succession practices on the other hand, were less practiced as compared to the two but still moderately practiced by family businesses. Notably, the two succession practices with the lowest score of 2.62 (moderately practiced) are the measuring of performance of the leadership position before and after the transition and the agreement of responsibilities of the predecessor after the transition. There are multiple reasons as to why family businesses usually do not agree or define the responsibilities of a predecessor after transition. Among these reasons is the unwillingness of the predecessor to lose control over the business (Kirschner & Ungashick, 2005; Cairns, 2011; Perrenoud, 2012). However, Perrenoud (2012) states that the responsibilities of the predecessor must be agreed upon in order to prevent conflicts from occurring after transition. Furthermore, a study by Sharma et al (2003) mentions that predecessors which do not have a defined role after transition have a risk of offending the successor and possibly even losing the successor. As for the practice of measuring the performance of the leadership position before and after transition, some family businesses avoid measuring the performance of the position itself, but instead measures the performance of the business as a whole as to avoid unwanted comparison and added pressure to the successor who to begin with already has a major responsibility to the business.

Table 2 displays the summarized results of the questions that fall under the perceived level of successful leadership transition except the quality of plan. Data reveal that the two variables with the highest mean score of 3.32 and 3.25 are PLSLT3 and PLSLT2, respectively. This was also the result for the study conducted by Perrenoud (2012). In his study however, the two variables fell under one main variable which refers to the respondent's opinion of the experience of the stakeholders which similarly received the highest score among the other variables. These two can

be explained by the fact that most of the successors of the family businesses were already present in the operation of the business and were already introduced and have been made familiar to the clients and employees as confirmed during the interview. Consistent with this result, the study by Savoleinen (2016) on Italian family businesses also revealed that most employees have a positive experience with the successors of the business because they already knew them beforehand.

**Table 2**

*Perceived Level of Successful Transition*

<b>Indicators</b>	<b>Mean</b>	<b>Interpretation</b>
PLSLT1- The leadership transition was smooth	2.75	MS
PLSLT2- The leadership transition received positive reaction from employees	3.25	MS
PLSLT3- The leadership transition received positive reaction from clients	3.32	MS
PLSLT4- There were no conflicts between the successor and predecessor	2.92	MS
PLSLT5- The successor did not experience any major surprises or mistakes during or after transition	2.58	MS

*Legend: 1.0 – 1.75 Not Successful (NS); 1.76 – 2.5 Slightly Successful (SS); 2.51 – 3.25 Moderately Successful (MS); 3.26 – 4 Highly Successful (HS)*

One of the respondents also revealed that the business received positive reactions from clients after the leadership transition because of changes applied by the successor which the predecessor chose not to apply because of traditional beliefs. It is possible that the leadership transition from the older generation to the younger generation brings about a positive change in terms of a new perspective which is more receptive of the changing trends and needs of their clients. The variable which landed in the middle of the group with a mean score of 2.92 is PLSLT4 which states that there were no conflicts between the successor and predecessor. This variable was moderately successful because conflict between the successor and predecessor cannot be completely avoided. Conflict in a family business is virtually inevitable because it involves so many different variables as seen in the Three-Circle Model by Tagiuri and Davis (1982; Davis, 2016). The three-circle model shows that the family business can be explained by three distinct groups that intersect into seven (7) sub-groups which constantly interact and make decisions. It is an environment wherein conflicts are bound to arise. A respondent cited a specific reason why conflicts between the predecessor and successor happen. The respondent mentioned that their difference in generation, the respondent being a millennial and his predecessor being part of the



silent generation, brings about their difference in mindset and inclinations which sparks conflict between them. Being in the silent generation, his father who was the predecessor had inclinations towards a more traditional mindset which was in contrast to his millennial point of view which again was more open to adapt to changing trends.

As for the variable which scored the lowest mean score of 2.58 (moderately successful), this was also the case in the study of Perrenoud (2012) wherein 58% of the respondents answered that successors experienced surprises with the transition and were actually caught off guard. According Porter et al. (2004), some of the surprises faced by a new CEO comes “from time and knowledge limitations.” It is, up to some point, normal for new family business leaders to face surprises given that the landscape wherein businesses operate and market trends are constantly changing. However, it is not completely out of the hands of predecessors to better prepare their successors for their new leadership role in the family business. The researcher probed further as to how family businesses would perceive a successful leadership position and several of the respondents answered that the growth of the business would indicate a successful leadership transition. This was an important factor mentioned by the interviewees because for them, the transition would only be truly successful if the successor exceeded the performance of the predecessor.

**Table 3**

*Quality of Plan Descriptive Statistics*

Indicators	Mean	Interpretation
QOP1- The succession was well planned	2.65	A
QOP2- The succession plan was formally compiled	2.51	A
QOP3- The succession plan was followed	2.73	A
QOP4- The people involved in succession planning met regularly	2.87	A
QOP5- The vision of the company was captured in the succession plan	2.93	A
QOP6- There was a plan to develop/train successor	2.96	A
QOP7- The company hired a succession consultant that greatly contributed to the succession plan	1.59	SD

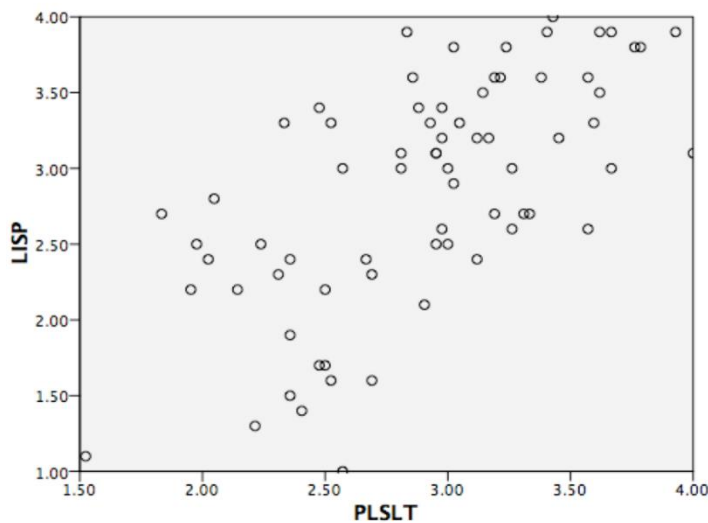
*Legend: 1.0 – 1.75 Strongly Disagree (SD); 1.76 – 2.5 Disagree (D); 2.51 – 3.25 Agree (A); 3.26 – 4 Strongly Agree (SA)*

The study separated the descriptive statistics for the Quality of Plan from the Perceived Level of Successful leadership transition in order to highlight a specific result which stood out

among other variables as shown in Table 3. This was QOP7 or whether the company hired a succession consultant that greatly contributed to the succession plan. This specific variable scored the lowest among all variables and was the only variable which translates to an answer of strongly disagree. This was the case for all interviewees. Moreover, only one of the interviewed respondents' family business formally compiled their succession plan (QOP2). The common reason among respondents as to absence of formal compilation of the plan is that their succession plan was simple and already implied which does not need formal compilation. As a family business, their intention of passing on the leadership role within the next family generation was already assumed but not necessarily forced. However, according to two Filipino-Chinese business managers the leadership responsibility was forced upon them.

**Figure 4**

*Scatter Plot of the Level of Implementation of Succession Practices and the Perceived Level of Successful Leadership Transition*



It can be seen in Figure 4 that there is an upward slope which signifies a positive trend between the two variables. The study by Perrenoud (2012) displays the same upward trend. Moreover, this result of a positive correlation between the two variables were tested further and verified using Pearson Correlation as seen in Table 4.

**Table 4**

*Correlation of the Level of Implementation of Succession Practices and the Perceived Level of Successful Leadership Transition*

		LISP	PLSLT
LISP	Pearson Correlation	1	.647**
(Level of Implementation of Succession Practices)	Sig. (2-tailed)		.000
	N	71	71
PLSLT	Pearson Correlation	.647**	1
(Perceived Level of Successful Leadership Transition)	Sig. (2-tailed)	.000	
	N	71	71

\*\**. Correlation is significant at the 0.01 level (2-tailed)*

Pearson correlation was used to analyze and verify whether there exists a positive linear association between the variables LISP and PLSLT. Based on the Table 4, there is a strong positive correlation of 0.647 between the two variables. It can also be seen that from a sample of 71, the variables are significant ( $r = 0.647$ ,  $p\text{-value} = 0.000$ ). This means that the more family businesses implement the top ten succession practices, the higher their perception of success is towards their leadership transition process. This result further supports the study of Perrenoud (2012), whenever businesses apply the top ten succession practices more, the higher their level of success when it comes to their leadership succession.

**Table 5**

*Multiple Regression of the Level of Implementation of Succession Practices and the Perceived Level of Successful Leadership Transition*

<b>Model Summary</b>					
R	R Square	Adjusted R Square	Std. Error of the Estimate		
.749 <sup>a</sup>	.560	.487	.38935		

<b>ANOVA<sup>a</sup></b>					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	11.590	10	1.159	7.645	.000 <sup>b</sup>
Residual	9.096	60	.152		
Total	20.685	70			

Coefficients <sup>a</sup>					
Model	Unstandardized Coefficients	Standardized Coefficients		t	Sig.
	B	Std. Error	Beta		
LISP1- Prepared succession plan in preparation for the leadership transition	-.016	.068	-.031	-.228	.821
LISP2- Analyzed the competencies of the candidates and selected the one that would best fit the leadership position	.064	.075	.115	.857	.395
LISP3- Prepared a plan to develop the successor	.058	.079	.101	.729	.469
LISP4- Defined and communicated the responsibilities to the successor	.156	.080	.269	1.935	.058
LISP5- Secured Senior level support for the transition process	.092	.066	.166	1.390	.170
LISP6- Constant and open lines of communication between predecessor and successor	-.175	.088	-.260	-1.993	.051
LISP7- Implementation of talent management processes such as hiring, training, and promoting during the time of transition	.106	.078	.193	1.361	.179
LISP8- Captured the vision of the company in the succession plan in such a way that decisions were made with the company vision in mind	.294	.081	.532	3.645	.001
LISP9- Measured performance of the leadership position before and after transition	-.023	.072	-.046	-.319	.751
LISP10- Agreed on the responsibilities of the predecessor after the leadership transition	-.123	.073	-.243	-1.690	.096

The ANOVA in Table 5 shows that the overall multiple regression model is significant for the study with a p-value of 0.000. Furthermore, the goodness of fit of the model can be measured through the R Square which can be seen in the Model Summary. The R Square of the equation is 0.560 which means that the independent variable LISP when taken as a whole can explain 56% of the variability of PLSLT. Since the independent variable can only explain 56% of the variability of PLSLT, this means that there are still other variables which could influence the how family businesses perceive the success of their leadership transition.

Based on the multiple regression analysis results, at 95% confidence level only LISP8- “Captured the vision of the company in the succession plan in such a way that decisions were made with the company vision in mind” was statistically significant (t-stat = 3.645, p-value = 0.001) in explaining PLSLT. The coefficient of LISP8 is 0.294. This means that an increase of 1 in the score of LISP8 will give an increase in PLSLT by 0.294.

This finding is parallel to the study of Neff (2015) which identifies a shared vision as the variable with the strongest positive and significant influence on the long-term success of the organization because it bonds the members of an organization towards a common goal. In the case family businesses interviewed in the study, the shared vision identified is to sustain the business and pass it on to the next generation. Moreover, it was observed by Overbeke et al. (2015) that when father and daughter share a common vision for the future of the business, the daughters are more likely to become successors of the business. The statistical data and the literature both emphasize the importance of a family businesses' vision in the success of the leadership transition. Furthermore, this vision must be shared and agreed upon by both the predecessor and the successor. This would help in aligning their intentions towards the business and would prevent conflicting interests thus smoothening the leadership transition process.

**Table 6**  
*Mediation Results*

Indirect and Total Effects

Type	Effect	Estimate	SE	95% C.I. (a)		$\beta$	z	p
				Lower	Upper			
Indirect	Level of Implementation $\Rightarrow$ Years of Existence $\Rightarrow$ Successful Transition	0.00648	0.01005	0.02617	0.01321	0.00843	-0.6447	0.519
	Level of Implementation $\Rightarrow$ Number of Family Generation $\Rightarrow$ Successful Transition	1.49e-5	9.00e-4	0.00175	0.00178	1.94e-5	0.0166	0.987
	Level of Implementation $\Rightarrow$ Number of Family Members $\Rightarrow$ Successful Transition	0.00160	0.00742	0.01294	0.01614	0.00208	0.2159	0.829

## Indirect and Total Effects

Type	Effect	Estimate	SE	95% C.I. (a)		$\beta$	z	p
				Lower	Upper			
Component	Level of Implementation $\Rightarrow$ Number of Employees $\Rightarrow$ Successful Transition	0.02663	0.02322	-0.01889	0.07215	0.03467	1.1468	0.251
	Level of Implementation $\Rightarrow$ Asset Siza $\Rightarrow$ Successful Transition	0.00976	0.01834	-0.02618	0.04571	0.01271	0.5324	0.594
	Level of Implementation $\Rightarrow$ Years of Existence	-2.37557	3.36414	-8.96915	4.21801	-0.08351	-0.7061	0.480
	Years of Existence $\Rightarrow$ Successful Transition	0.00273	0.00173	6.56e-4	0.00611	0.10096	1.5800	0.114
	Level of Implementation $\Rightarrow$ Number of Family Generation	-0.00157	0.09420	-0.18619	0.18305	-0.00198	-0.0167	0.987
	Number of Family Generation $\Rightarrow$ Successful Transition	-0.00950	0.06163	-0.13029	0.11129	-0.00981	-0.1541	0.877
	Level of Implementation $\Rightarrow$ Number of Family Members	1.34808	1.07098	0.75101	3.44717	0.14774	1.2587	0.208
	Number of Family Members $\Rightarrow$ Successful Transition	0.00119	0.00542	0.00944	0.01181	0.01411	0.2191	0.827

## Indirect and Total Effects

Type	Effect	Estimate	SE	95% C.I. (a)		$\beta$	z	p
				Lower	Upper			
	Level of Implementation ⇒ Number of Employees	0.19800	0.16468	- 0.12476	0.52076	0.14126	1.2023	0.229
	Number of Employees ⇒ Successful Transition	0.13451	0.03525	0.06542	0.20361	0.24542	3.8157	< .001
	Level of Implementation ⇒ Asset Size	0.07050	0.13045	- 0.32618	0.18518	- 0.06400	-0.5404	0.589
	Asset Size ⇒ Successful Transition	0.13851	0.04450	- 0.22573	- 0.05129	- 0.19859	-3.1125	0.002
Direct	Level of Implementation ⇒ Successful Transition	0.56522	0.05021	0.46681	0.66364	0.73575	11.2562	< .001
Total	Level of Implementation ⇒ Successful Transition	0.59676	0.05488	0.48920	0.70432	0.79255	10.8740	< .001

Note. Confidence intervals computed with method: Standard (Delta method). Betas are completely standardized effect sizes.

The results suggest that the only organizational profile that affects the model is number of employees and asset size to successful transition. This means that the two aspects of organizational profile affects the successful transition of family businesses. The moderating variables do not have any significant influence on the effect of the level of implementation of succession practices to the perceived level of successful leadership transition. This means that the organization profile of the selected multigenerational Filipino family businesses did not have a role in determining the perceived level of successful leadership transition. According to Molly et al. (2010), other factors

such as family harmony may be integrated in order to further understand and evaluate the success of the leadership transition of a family business.

## 5. Conclusion

The study looked at multigenerational family businesses in the Philippines to determine how these businesses have been successful in the process of intergenerational succession through the implementation of the succession practices. It provides a descriptive and correlational analysis of the succession planning practices of multigenerational family businesses. The respondents of the study were family members of the existing multigenerational family business who assume top management positions and are involved in the succession planning process.

The study found out that the level of implementation of succession practices has a strong positive correlation to the perceived level of successful leadership transition of multigenerational Filipino family businesses regardless of the organization profile in terms of the form of ownership, years of operation, number of family generations involved, family members involved, number of employees, asset size, and industry. Among the top ten succession practices, it was found that constant and open lines of communication as well as the definition and communication of the responsibilities of the successor were the most common succession practices implemented. Upon further analysis of each succession practice, the most significant practice which affects the perceived level of successful leadership transition was the integration of their vision to the succession plan. The study also discovered that a number of the family businesses were unconsciously practicing some of the top ten succession practices. However, there were also practices or activities which cannot be completely measured by the ten succession practices. In conclusion, the study finds that the implementation of the top ten succession practices helps family businesses succeed in their leadership transition regardless of organization structure. However, the success of the leadership succession of family businesses does not solely rely on these generic practices, but also to more family related practices which improve family harmony and family dynamics.

This study acknowledges the fact that the succession practices of an organization is not the only factor for the sustainability of a family business. Other factors may still be considered in order to better understand how the perceived level of successful leadership transition increases.



Specifically, factors relating to family harmony or family dynamics may be taken into consideration in studying how family businesses succeed in their succession. Much of the practices identified in the study were not exclusive practices to family businesses but were generic practices which could also be implemented by other businesses undergoing succession. For this, further research is encouraged to test other variables relating to family harmony and family dynamics through an increased sample size.

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# Linking Motivation and Employee Engagement through Gamification in Remote Working

Justine Jude Pura

## Abstract

Due to the COVID-19 pandemic, numerous organizations have shifted to remote work, telework, or work from home (WFH) for the employees' safety. However, remote work reduces motivation, especially if employees have no choice on where to work. Apart from the motivation of employees, the levels of engagement are also decreasing. With the emergence of telework, numerous challenges are also identified. This research identifies, enumerates, and establishes the need for gamification, a trending concept that uses game elements (or motivational affordances which include points, leaderboards, badges, etc.) to non-game context (marketing/commerce, education, work, etc.) in remote work, to increase the levels of engagement and motivation, as well as to overcome the challenges employees encounter in the new set-up. With the lack of in-depth literature on gamification together with the emergence of work-from-home in the new normal, the researcher used a qualitative design to explore the concept and interviewed 10 employees from the Philippines who were forced to work remotely. The participants for the interview were chosen using the Purposive Sampling method and were asked about their perceptions on motivation, employee engagement, and games, as well as their perception towards implementing gamification in their new workplace. The interviews were done through online interviews (conference call). This research shows a positive response and potential effect on leveraging both motivation and employee engagement through gamification. With the perceptions of the participants toward gamification, this paper could help develop concepts or theories for potential quantitative research, as well as encourage organizations to implement gamification in the workplace to avoid potential problems.

**Keywords:** *Remote Working, Gamification, Employee Engagement, Motivation*

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## About the author:

DICT – ICT Literacy and Competency Development Bureau Project Development Officer 3. Team leader of the Digital Education Program.

\* *This paper is a finalist in the ILARI Research Competition (IRC) – 2021 Category 3 – Graduate*



## 1. Introduction

Because of the COVID-19 pandemic, numerous organizations have shifted to remote work, telework, or work-from-home for the employees' safety. Huge adjustments are being made by organizations to maintain a smooth business despite the hassles. Because of the pandemic, it could cause a permanent shift towards remote working since there is an increased awareness of cost-saving opportunities. However, challenges arise in this 'new normal' of working. According to McGregor and Doshi (2020), work-from-home reduces motivation, especially if an employee had no choice on where to work.

Apart from the motivation of employees, another question that should be addressed by organizations is "Are the employees engaged?" A study released before COVID-19 by Effectory, an Amsterdam-based organization conducting the Employee Engagement Index, states that over the past four years, there is only an increase of 4% in engagement and commitment levels worldwide. In addition, the global levels of engagement remain low at 30% (Hickman, 2020). It is also confirmed by Forbes (2017) that with the emergence of telework, it will be challenging to maintain employee engagement. With this low level of engagement before the pandemic, there is a high chance that it will be way lower during the work-from-home set-up.

This research proposes a solution to address the two challenges (decrease in motivation and decrease in engagement) presented in remote work: to implement the concept of gamification - the use of game elements (or motivational affordances which include points, leaderboards, badges, etc.) to non-game contexts, such as marketing, commerce, education, and work. This paper is designed to establish the need for gamification in remote work to increase levels of employee engagement and motivation of employees. Specifically, it collects the perceptions of employees towards gamification and their problems in a remote work setup, assesses the sources of engagement and motivation of employees who were forced to work remotely and identifies the different game elements which will make the concept of gamification both engaging and motivating in a remote work set up.

## 2. Literature review

### *Employee Engagement and Motivation*

According to Forbes (2017), engaged employees are intrinsically motivated, and when they are intrinsically motivated, employees enjoy their work. It is suggested that intrinsic motivation

should be ignited for engagement to be sparked. That is, by clearly defining roles and goals, establishing the purpose of employees, and recognition, which does not necessarily mean rewards. Several articles have also associated employee engagement and intrinsic motivation. Intrinsic motivation and employee engagement can be influenced by how employees find their job meaningful (Kordbacheh et al., 2014). The role efficacy of an employee also influences and determines the level of employee engagement, motivation, and attrition (Bhuvanaiah & Raya, 2015). The relationship between employee engagement and intrinsic motivation was also found to be mediated by employee creativity, and the relationship between creativity and intrinsic motivation is moderated by psychological detachment (Ghosh et al., 2020).

Positive effects are associated with employee engagement being linked to intrinsic motivation. Leaning towards building intrinsic motivation in employees would avoid the unsustainable extrinsic rewards system, in which employees are only motivated to work because of cash incentives or motivated because of the fear of losing their jobs. These are potential causes of burnout and disengagement of employees (Richardson, 2017). Regardless of whether employee engagement is linked with intrinsic or extrinsic motivation, the literature on the connection between the two constructs is still weak.

### ***Gamification, Employee Engagement and Motivation***

According to Olenski (2014), one of the best mediums to make people feel involved in the company is through games. The engagement in using gamification has been used as a marketing strategy of marketing executives (Lucassen & Jansen, 2014). Some examples of gamification used by giant companies are the following: Samsung Nation - Samsung also used the concept of gamification as part of its marketing campaign; The Windows Language Quality Game – a strategy used by Microsoft to ensure its translations were accurate; Cisco also used gamification to keep its employees engaged by investing in a global social media training program to improve their employees' social media skillset; Deloitte using gamification for training senior executives by using badges and leaderboards; and Google gamified the submission of travel expense of employees, in which it resulted in a 100 percent compliance of employees in submitting the travel expense information.

Huotari and Hamari (2014) also linked gamification with motivational affordances and psychological outcomes since gamification invokes psychological experiences. Motivational affordances were categorized into ten (10) categories, which are points, leaderboards,

achievements/badges, levels, story/themes, clear goals, feedback, rewards, progress, and challenge. Motivational affordances are also used in the development of Information and Communication Technology (ICT) designs to attract users. According to Zhang (2008), “*the ultimate goal of designing an ICT for human use is to achieve high motivational affordance so that users would be attracted to it, really want to use it, and cannot live without it*” (p. 145). Zhang (2008) defined ten principles: (P1 and P2) autonomy and self-identity (psychological), (P3 and P4) competence and achievement (cognitive), (P5 & P6) human interaction and social bond (social and psychological), (P7 & P8) leadership and followership (social and psychological), (P9 & P10) affect and emotion (emotional). The outcomes of gamification can be analyzed thoroughly on how the motivational affordances were implemented (Hamari et al., 2014). Thus, for a gamified system to be effective, motivational affordances should be considered in the designing of game elements.

The effectiveness of gamification is based on the game design elements which have specific psychological effects. Certain game design elements affect fulfilling psychological needs (Sailer et al., 2017). Using the framework of self-determination theory, game design elements were analyzed and classified. Seven game design elements were analyzed, and these are points, badges, leaderboard, performance graph, meaningful stories, avatars, and teammates, and were identified with the factors of SDT. For example, avatar, stories, and teammates affect social relatedness. A good implementation of game elements contributes to the satisfaction of psychological needs and is a strong driving force in overcoming problems in motivation at work.

Another role of motivation in gamification is that the motivation of employees is amplified if they are moved to perform a task (Ryan & Deci, 2000). There are numerous sources of motivation, and that includes games. According to Yim and Graham (2007), The Wii from Nintendo and Dance Dance Revolution of Konami were widely used to motivate people to be physically active. This leads to the concept where a game can be used as a tool to motivate people. As the concept of gamification arose, it is not impossible to link it as a driver of employee motivation. Gamification is also proven that it has a direct influence on motivation, particularly, extrinsic motivation, using extrinsic rewards (Zuckerman & Gal-Oz, 2014). On the other hand, if intrinsic motivation is absent, reward-based gamification is expected to be sufficient (Hassan, 2016).

### ***Gamification and Remote Working***

According to Schawbel (2018), remote workers can be disengaged and are less likely to stay in the company in their long-term. However, companies had no choice but to place employees in a remote work environment during the pandemic. Similarly, McGregor and Doshi assert that “*working from home is likely to reduce motivation*”. In a survey conducted between 2010 and 2015 showed that employees working from home have a lesser motivation than people who are working in the office. Motivation is way lower if employees have no choice where to work (McGregor & Doshi, 2020). Now that most employees have no choice to work because of the pandemic, it is most likely that the decreasing levels of motivation of employees are one of the challenges being faced by most businesses.

According to McGregor and Doshi (2020), business leaders can do something about this, by adjusting strict rules and work procedures, since it can create a spiral of demotivation, which results in less creative thinking. Increasing engagement of team members is also one of the solutions to this pressing problem. Engagement increase is possible by giving autonomy to employees for them to think creatively and maintain their motivation. With remote work, numerous challenges are now being encountered by companies. Although it can bring convenience and it can save employers and employees time and money, WFH also means a decrease in employee engagement and motivation for some.

According to TechWire Asia, companies have been pushing with gamifying remote work operations to instill engagement among employees, even when they are not in a common office space (Devanesan, 2020). The use of digital tools such as Microsoft Teams or Slack can help companies gamify the employees’ experience. For instance, gamification can be used for teaching new employees regarding the companies’ products and services, as well as their culture and processes. Even conducted remotely, gamification can also be applied to enhance performance and sales, as well as promote social collaboration. Gamification can build and motivate a remote team (Laker, 2020).

According to Beresford (2020), gamification has two types: finite and infinite. Finite gamification is designed to have an end, to have the first prize, or to have a complete set of badges. On the other hand, infinite gamification is designed to just have an upward progression (Beresford, 2020). Examples of infinite gamification include The Oscars (annual voting), TIME Magazine’s Person of the Year, UNDP Human Development Index, and the employee of the month and quarterly sales, leaderboards, of which all are classified under infinite gamification. Another



example is the loyalty program of airline companies (air miles), in which infinite gamification is used. This type of gamification also emphasizes metrics or scores and can have a big impact on businesses. According to Lake (2020), infinite gamification can be very powerful. With this, it can be used as a tool for motivating and inspiring the team even when they are working remotely. Beresford (2020) states that a good infinite gamification program should start small and be kept simple. An example of Beresford's program on infinite gamification is the extensive use of social media of UN staff to promote their activities inside and outside the organization. Social media accounts now gained millions of followers after the program was launched.

### **3. Methodology**

#### ***Research Design***

This study used a qualitative approach, in which it will allow the researcher to provide a depth of inquiry (Creswell, 2013). This paradigm is also flexible in which it will allow the researchers to analyze the participants' experience and views on the concept. This research design is the most appropriate since there is only a handful of in-depth literature relating to gamification, particularly in the perceptions of its usage and effect on work-from-home employees involving employee engagement and motivation. Given the limitations, qualitative research is the most appropriate design. With the lack of in-depth literature on gamification together with the emergence of work-from-home in the new normal, the researcher used a qualitative design and collected perceptions of employees who were forced to work remotely about the concept of gamification.

#### ***Participants***

Ten work-from-home (WFH) employees from different organizations were asked about their perceptions of the concept. The respondents were interviewed via Zoom and were notified that all information is confidential.

In selecting the participants, Purposive Sampling was used. Purposive sampling is used when the cases are very low and special. It is also called judgment sampling or choosing the participant due to the qualities they possess (Etikan, 2016). Through this sampling method, the researcher can obtain information-rich cases and can focus on people who can provide relevant information. Since in-depth studies on gamification and work-from-home combined were very

low, a purposive sampling would be appropriate. The samples should fit into the particular profile: work-from-home employees because of the pandemic and should be familiar with games or a casual gamer. Employees who are familiar with games particularly game design and game elements will contribute more knowledge in terms of the factors that make a game engaging and motivating. This simulates the concept of gamification of which some of the participants may not be familiar with. After conducting the interview, participants were asked if there are further questions or concerns.

All participants surveyed are single and are living and working in the Philippines. All participants in this study mostly work in the tech industry, but they are classified specifically to Business Process Outsourcing (BPO), Information and Communication (including e-commerce, etc.), Finance, and Education. Also, most respondents have more than 1 year of work experience. Lastly, all respondents who were interviewed are working remotely because of COVID-19.

#### ***Data Gathering Instrument and Process***

An in-depth interview method was used to collect the data. Open-ended questions were asked so participants can answer and share their thoughts freely, in particular with their perceptions in gamification in a remote work set-up. Because of the pandemic, a face-to-face interview was not possible. Instead, online conferencing was used to do the interview.

The participants were notified that the meeting is recorded for validation purposes and was asked questions about the criteria. The participants must fit into the criteria for them to proceed with the main interview. The respondents that fit into the criteria were asked the following questions:

- 1. What factors make you feel engaged at work?*
- 2. What factors make you feel motivated at work?*

For the first two questions, the researcher explained thoroughly to the respondents providing the definitions of employee engagement and motivation. Following Kahn's Theory of Employee Engagement, in which employee engagement is the ability of employees to be in their "full self" while working (Kahn, 1990). It is also where employees find that their work is meaningful (Robinson, 2004), and where they can be proactive (Macey & Schneider, 2008). The respondents were given various examples of what employee engagement is. On the other hand, the term motivation was also explained and discussed to the respondents. Respondents were aware

that motivation can be intrinsic and extrinsic, in which they feel motivated because of the work they do (intrinsic), or they are rewarded (extrinsic) (Ryan & Deci, 2000). They can also be motivated because of the autonomy, connection, or competence, according to the Theory of Self-Determination (Ryan & Deci, 2000). According to Fowler (2014), people often confuse motivation with engagement. Hence, the respondents were briefed on the difference between the two terms.

*3. Apart from network connection and accessibility, what are the challenges you have encountered, or you can think of when your company shifted to remote work or Work-from-Home?*

This question determined other problems employees are experiencing, which can cause why employees are demotivated or disengaged. The study anticipated that network connection and accessibility will be the most common answer since participants are situated in the Philippines, a country that has one of the slowest internet services in the world (Leyco, 2020). To gather more insights from the respondents, the exemption of connectivity was added to the question.

*4. What do you think makes the game exciting or fun?*

In the criteria used in the survey, one of the qualifications of the respondents is that he or she must be a gamer or self-identified as a gamer. This criterion suffices the lack of the researcher's connection with game theorists or game developers, which would be more appropriate as the respondents for this research. With this qualification, respondents are believed that they can easily identify the game elements. The awareness of game elements is critical to the study since gamification is one of the primary concepts for this study, and one of the research objectives is to identify the game elements which can create an impact for a gamified system to increase employee engagement and motivation. To instigate a clarification for a future misconception, gamification will work for most employees, regardless if they are familiar with games or not. The ability to thrive in gamified systems will not depend on the employee's knowledge of games. It works well for everyone, although some people may have difficulties with this concept if they focus too much on the competition aspect (Farrell, 2018).

*5. What do you think of Gamification?*

*6. How can this concept make you feel engaged or motivated?*

The last two questions pertain to the perspectives of employees in gamification. The fifth question (i.e., *What do you think of Gamification?*) allows the respondents to give their perspectives about gamification freely. Also, not all respondents are familiar with the concept of gamification, so the respondents were given an in-depth explanation of how gamification works

by letting them watch a YouTube video. The video explains briefly and concisely how gamification can be applied in the workplace. The concept was further explained through its generally accepted definition (i.e., the use of game elements such as badges, leaderboards, points, to non-game contexts such as education, commerce, and workplace). Afterward, they were asked about their perceptions about the concept of gamification and how it can affect their engagement and motivation (questions 5 & 6).

### *Data Analysis*

The study used thematic analysis, a six-step process in analyzing qualitative approach by classifying them into themes (Braun & Clarke, 2006). Thematic analysis is a useful tool in qualitative psychology that is flexible and has freedom. It is also designed to identify and analyze the patterns within the data. The data are coded and then classified into themes. Themes are the “patterned response or meaning within the data set” and are based on the researcher’s judgment (Braun & Clarke, 2006). The recorded interviews were transcribed, which is the first step. During transcription, the data are being familiarized. While reading the transcriptions, some repetitive words and ideas are mentioned by the respondents. For example, when respondents were asked “*What do you think about gamification?*” several respondents mentioned common words. For instance, respondent #4’s answer mentioned the following:

*“I think this kind of this kind of concept is beneficial to a team because it brings out the **competitiveness** of each member as they can see their progress.”*

On the other hand, respondent #5 answer:

*“For me personally, what I've said before, I really like the **competitive** scene of gaming, so I am really **competitive** as well in work and where I work.”*

The extracted data (sentences) were coded into **Competitiveness** or the **competition**.

After the data were coded, it was then classified into themes. For the next three steps (searching for themes, reviewing themes, and naming themes), since the concepts are already laid, themes are easier to generate. For example, the code **competition** can be classified under the theme of **Perceptions on Gamification**. Four more themes were identified: **Perceptions on Engagement**, **Perceptions on Motivation**, **Perceptions on Game Elements**, and **Remote Work Problems**. There are five themes in total that were generated after the analysis. The codes that are under the themes were reviewed and analyzed. The codes were reviewed based on the researcher’s judgment whether to include it or not in any of the themes. Several codes were noticeable that

correlate with one another. The discoveries are produced into a report, the sixth and final step of thematic analysis.

### ***Research Ethics***

All ethical guidelines presented by National Sun Yat-sen University (NSYSU) were adhered to by the study. In the process of data collection, each participant was invited via Zoom, an online conferencing application. Before beginning the interview, participants were reminded that their involvement in the study is voluntary, and they may choose not to participate or to stop at any time. The participants were also reminded that the results of the research study may be published, but their names will not be used. Participants were also informed that their identity will not be associated with their responses in any published format.

## **4. Findings and Discussion**

***Theme 1: In this pandemic, the workmate relationship is a strong driving force of motivation and employee engagement.***

Regardless of the work environment, whether employees are working in their offices or remotely, this study was able to determine that the employees' relationship with their workmates is a strong driving force of motivation and employee engagement. A close friend at work can help an employee boost his or her engagement, especially if the employee has a positive relationship with other co-workers as well. This also creates a stronger relationship with the company, which also drives employee engagement. One of the respondents answered the question "*What makes them feel engaged?*", and the response is "*The people I work with, they're pretty welcoming and we're just like friends, even though there are higher levels, we call ourselves by first name basis so it's like you're a friend plus a trainer or a boss.*" Another response is "*I think I'm engaged with my environment and my co-workers as well, and especially with how my manager interacts with its employees.*"

Apart from employee engagement, levels of motivation are also increased if an employee has a good relationship with his or her workmates. Being connected with people can make employees intrinsically motivated. This claim is also supported in the Self-Determination Theory (Ryan & Deci, 2000).

***Theme 2: The absence of good communication is a common remote work problem***

Miscommunication is one of the problems being encountered oftentimes by employees in a remote work setup. Communication with their workmates has been a struggle since they cannot convey or relay everything virtually. By analyzing several responses, communicating with workmates personally is very different compared to communicating virtually. One of the respondents said, *“Since, before the pandemic, we used to go to the office and do our job there. So, communication is easy, and it is personal. So, you can easily relay what you want to say and what you want to convey to the person that you are talking to compared to doing it and chatting with each other online. I mean, it kind of lacks something.”* Another response said that *“I think the communication because right now is really hard to communicate with your teammates through chat so I think that's what I think that's very challenging.”* Also, one of the respondents mentioned about the problems in interaction, *“Another is the interaction and being able to teach the other team members or if there is anything that needs to be done faster, I feel like we can do it on and off is much easier”*

The communication barrier that is being created by remote working causes different problems. In remote working, how employees communicate in a way that is understandable by others is a problem that should be focused on by organizations. An actual task that was mentioned by one of the respondents emphasized the communication problems: *“(Another) challenge is communication. For example, when I when I messaged my QA (quality analyst) lead to ask a question about a specific error or specific bug. So, I do not know if to compare it physically. Of course, physically is very easy for you to communicate. But when it comes to virtually, it is very hard because you cannot see them. Maybe you can overthink like are they ignoring you or like that, it's my challenge to work from home.”*

***Theme 3: Social (or connectedness) is an important game design element in amplifying motivation and employee engagement***

The perceived effect of the connectedness of gamification links employee engagement and motivation. The communication and relationship of the team can increase engagement and motivation if they are immersed in an activity that would allow them to collaborate and build interaction with other team members. As defined in the Self-Determination Theory (SDT), connectedness or relatedness boosts motivation, as well as it can bring or boost engagement. People also enjoy the game because of the collaboration and interaction they can do within the

game. One of the respondents mentioned: *“The interaction with other people is one of the main factors (what makes a game exciting or fun). And as a gamer, it gives me some points in terms of gaming because I wanted to do some gaming with other people.”* The sense of engagement in connecting with other players can also be identified in one of the responses: *“And another reason is that when you play with your friends, the memories and bond that you create together, those are memorable, and I think that's also a reason why we keep playing games.”*

If the sense of connectedness can make the employees engaged and motivated. This suggests that for a gamified system to be more effective, a collaborative element must be involved. Instead of designing systems that only recognizes individual efforts, a *team or a pair recognition* could be more engaging and more motivating. For instance, gamification can be implemented in pair programming, a technique wherein two developers work at one station, where the one observes and the other one writes the code. In a remote set-up, wherein large teams are involved in one project, this technique can be possibly gamified.

Apart from the findings that provide answers to the objectives and research statements, several findings were also determined in this research.

*a. Gamification makes employee motivated and engaged if implemented properly*

When the respondents were asked about their perceptions on gamification, many have perceived a positive response, which includes improving productivity, makes the team collaborative, improves engagement, makes the employees motivated, and brings out the competitiveness of employees. However, based on several responses, the effectiveness of gamification depends on the leaders and how it is implemented. According to one of the respondents, *“It depends on how the managers and leaders use this kind of method”*, which means leaders should thoroughly examine what will be the set-up of implementation of gamification, as well as which game design elements should be focused on. Another response was noted in this section in terms of implementation and using the right game elements: *“I think the main challenge for this one (implementing gamification) is what are the elements that we might apply for our work activities. Not all game elements are not applicable to these kind of activities and basically, we want to precisely match those game elements in our work elements, and I think that's the main question or maybe challenges in terms of implementing gamification in terms of how it will be implemented.”* On using what kind of gamified system also matters as well as its cost-efficiency, as one of the respondents mentioned: *“I think some companies are not able to do this yet due to*

*lack of funds right now, but I think there are also companies like maybe big companies that are already doing this, but maybe not on the level of high gamification. The system that you put so that you can monitor the points is a bit pricey to add to that, you also have to prepare rewards. So those two the system and the rewards are what makes it costly, in my opinion.”*

*b. Remote work also challenges the productivity of employees*

Apart from communication problems, productivity was also identified as one of the major problems of telework. For employees, being at home makes them feel less productive because they can sleep or be unproductive anytime. Remote work employees find a hard time separating their duties at home and work, and the environment also affects their productivity. The following statements were mentioned by one of the respondents *“My first challenge was the environment. Of course, because since this is a home, this is not a working area for you, because of many kinds of stuff at home. For example, I cook, and I clean the house. Yes, 8 hours should be working, it should be working on the company. But you have so many responsibilities when you are at home in terms of when you're at the office.”* One of the respondents also confirmed that productivity can be challenging: *“Other challenges that there could still be in here is the productivity. There could be a lot of distractions and distractions at home.”*

*c. Gamification is not for everyone*

It is also important to note that the implementation of gamification, will not work for every employee. The competitive factor of gamification is one of the factors why some respondents think that not everyone can enjoy gamification. One of the respondents think that some employees are not just as competitive as others: *“I think gamification would work well for me personally. I think for some of my team members as well, they might not feel that good, because some people are competitive, some are naturally not, so I think it might work on some, but not all. For me personally. I think it might work.”* Other employees may also be left behind because of their current progress as an employee. One respondent mentioned that employees who are already struggling cannot keep up with the implementation of gamification in the workplace: *“As for others, they're not prepared for it if their productivity is low or already struggling and they keep getting left behind, I think that will affect their productivity over the others.”*

The implementation of gamification in the workplace is one of the things organizations must focus on if they want to gamify tasks. It is important to note that gamification is not for



everyone. However, the collaborative element of gamification could help some employees see the value of gamification as a factor that could help them in their job.

## 5. Conclusion

The goal of this research is to determine if gamification is necessary based on the answers of the ten respondents to the research questions. The findings of this study confirm that there is a need for gamification in remote work set up to help increase engagement and motivation levels of employees. Using thematic analysis, a common response can be noticed in the coded answers across themes. The link of employee engagement and motivation through gamification is evident in the answers of the respondents, which is communication/people/connectedness/collaboration. Gamification can increase levels of engagement and motivation of employees in remote work if it is collaborative. Focusing on the game element of collaboration in designing a gamified system is needed in gamification. Through gamification, it can also address the communication problems of employees caused by remote work. Therefore, if organizations are looking for solutions on how employees can be motivated and engaged while working remotely, then gamification could be considered as one of the solutions. The perceptions of the respondents on gamification also confirm that it can help organizations motivate and engage employees.

The collaboration/social element can make gamification effective in addressing problems in remote work, decreasing levels of motivation, and decreasing levels of engagement. It should also be noted that gamification is not for everyone since the element of competitiveness is also present in gamified systems. Some employees may find it difficult adapting to gamified tasks because not everyone can be as competitive as others. However, this perception can be from a preconceived notion of individual competitiveness, as to what gamification is always designed to be. Adding the element of collaboration can change the game and culture of gamification. From individual badges, first placer, or employee of the month, it could turn into group badges, the team of the month, or best pair of the week. In this way, one employee can encourage his or her co-workers to participate and be competitive in achieving goals and beating deadlines. This could help increase employee engagement and motivation, as they can help one another in pushing each other to finish tasks while getting points and badges.

Since the levels of employee engagement and motivation are decreasing due to remote work, it was found that people, workmates, or relationships give employees an engaged feeling

and motivation. Thus, it can be inferred that poor connection or relationship with people could greatly affect the motivation and engagement of an employee. This can be a factor that companies should consider in the new normal which they must act something about it. It was also found that apart from levels, stories, or badges, the social factor of gamification is essential in developing a gamified design in this era of remote working. An employee can maintain his/her motivation and engagement in the company if the gamified system will involve pairs, groups, or teams to achieve something. This can also address the problem of communication as employees will be more connected using a gamified design that involves connecting or collaborating with other workmates. Gamifying communication could help lessen miscommunication among teams in remote work. But before gamifying, leaders must pinpoint how frequent is the miscommunication or what are the common miscommunication issues to identify how can gamification help. Since connectedness is a factor that can influence both employees' engagement and motivation levels, collaborative gamified systems can be used.

This study suggests on the following: leaders can challenge their employees by grouping or pairing them to identify the most bugs; pair assignments or quizzes can also be created by managers to remind their employees of the important knowledge they should keep; and deadline by pairs or by groups can also be implemented.

Companies who have purchased gamified applications to monitor the performance of the employees may also consider having pair achievements or group recognitions in this new normal. In this way, employees who do not perform well or those who are always at the bottom of the leaderboard will be motivated if they are paired with another workmate, or if they are in a group. Moreover, keeping the real connection among employees in a set up wherein it is divided by screens is a challenge in today's setting. Remote work will remain in the next years regardless of the existence of the pandemic, and maintaining a connected team is vital to the overall engagement and motivation levels of employees. Redefining gamification from focusing on individual achievements to team achievements could bring greater results in teams.

This study has several limitations including absence of relevant theory, limited sample size, focused on single industry, limited access and cultural diversity of the participants. As such, quantitative study on how gamification can be effective to improve communication in a remote work setup, cross-cultural study of employees using gamification in the remote workplace and the use of other constructs such as job satisfaction, organizational commitment, psychological empowerment, and/or creativity are encouraged.

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# Records Management Strategies and Professional Performance of Administrative Staff

<sup>1</sup>Jimuel L. Gesmundo, <sup>1</sup>Raven Ryan B. Glorioso, <sup>1</sup>Karen Joy Raviz  
& <sup>2</sup>Elaine Joy C. Apat

## Abstract

This study correlated the records management strategies of the administrative staff at Laguna State Polytechnic University with their professional performance. The descriptive quantitative research involved 59 administrative staff through the researcher-made survey questionnaire distributed through Google forms. The results of the study proved that there is a significant difference in the records management strategies when grouped according to age, gender, job tenure, and job position in the department. However, there was no significant difference among the professional performances when grouped according to age, gender, job tenure, and job position in the department. The study also confirmed that records management strategies have a positive significant relation to professional performance. The findings can help improve the university policies, procedures, and strategies in managing records. Therefore, it is recommended to provide training programs and improving implementation of evaluation and assessment to the administrative staff to expand their professional proficiencies.

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## About the authors:

<sup>1</sup>Student, Laguna State Polytechnic University-San Pablo City Campus College of Business Management and Accountancy

<sup>2</sup>Instructor 1, Laguna State Polytechnic University-San Pablo City Campus

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## 1. Introduction

Any higher education institution, primarily universities and colleges, relies heavily on records. Through records, it recognizes and demonstrates orderly and systematic leadership and administration. Furthermore, records provide transparency to everyone who benefits from the institution, including individuals and stakeholders. Transparency of records only serves to demonstrate the institution's informative progress and equitable service delivery to its stakeholders. As cited by Adade et al. (2018), the academic service life of a student and his relationship with the university might not end, given that students may return to the university after graduation to request relevant academic documents, either to further their education or to obtain a referee note. Due to its strategic role in management, records are also one of the most important contributors to an organization's success. As a result, records, like any other business resource, must be managed systematically (Hashim et al., 2018).

For any organization to function effectively, record keeping, and good record management are also considered necessary (Ademola et al., 2012). While the study of Seniwoliba et al. (2017) stated that in higher education, record keeping, and management are essential, the importance of institutions cannot be overstated. The institution's long-term viability is heavily reliant on the availability of useful records. As a result, records play an important role in higher education management, from the institution's founding to the stages of development, implementation, monitoring, evaluation, and renewal of its programs, and these are vital pieces of information for the institution's continued survival. Moreover, according to Shonhe and Grand (2018), good records management improves the efficiency and effectiveness of public service delivery by reducing litigation risks, promoting accountability and transparency, ensuring compliance with regulatory requirements, and promoting informed decision-making. Furthermore, every strategy implemented by institutions such as universities is vital for the order of records. Thus, university policies help ensure that the system of creating, modifying, and preserving records runs smoothly. Furthermore, Tagbotor et al. (2015) indicated that organizations and individuals commonly need to consult records of previous activities and decisions in the course of their business activities, for instance, to provide background information, establish the existence of a precedent, or substantiate or refute a claim or allegation. In this case, records are essential to an organization's administrative function. Furthermore, Allison (2021) emphasized that registry staff must record, keep, and manage these records using good record management practices. Their ability to effectively manage

these records will determine the quality of records/information the universities will have and the type of decision they will make, as well as their job performance.

However, Azameti and Adjei (2013) noted that in public tertiary institutions, the lack of adequate equipment to effectively manage electronic records is a major indictment of administration's commitment to record-keeping. Similarly, Allison and Otuza (2017) mentioned that many students have suffered as a result of poor records management in terms of credentials, exam scripts, and results at many universities. This was also the issue raised by Barde et al. (2019) that due to poor records organization, retrieving students' academic records was slow and time consuming. These challenges lead to difficulties in administering, developing, and supervising educational systems (Amanchukwu & Ololube, 2015), and delays in graduating students (Mabera, 2015).

With the changing workplace demographics due to the pandemic, university staffs faced adjustments in handling and processing records such as administrative, student, and personnel data. For instance, the Laguna State Polytechnic University experienced delays processing documents, especially now that institutions are adjusting to virtual or online record processing, due to the volume of students. As such, this study finds records management beneficial to the staff and organization as a whole. This study examined the perceived impact of records management strategies on administrative staff's professional performance. The study also explored the difference among records management strategies and professional performance in terms of age, gender, job tenure, and position in the department. It also analyzed the correlation between records management strategies and professional performance.

## **2. Literature review**

### ***2.1. Importance of Records Management***

According to Faulhaber (2019), records management is a must-have function for industries, charitable organizations, government agencies, civic groups, medical, commerce, financial, schools, colleges, and universities, and other types of entities that generate information that must be kept for a specific amount of time. As explained by Lush and Young (2019), keeping records straight is not only good business practice, but also necessary for running a productive, well-functioning company. The foundation for business intelligence and the ability to make data-driven decisions that affect the bottom line is having a proper record management system. Moreover,



academic records management is an essential tool in the university administration's effective and efficient operations of students' records (Seniwoliba et al., 2017).

Effective records management is one of the strategies for ensuring quality assurance in higher education management (Joy & Agala, 2019). Records help with decision-making, documenting public operational processes, providing evidence of policies, decisions, transactions, and activities, and assisting the university in legal cases (Giba-Fosu, 2020). Thus, all universities must take responsibility for the proper storage and management of their records.

Clear, consistent, and organized records are essential for keeping compliance and avoiding future issues (Heaney, 2021). For example, developing effective office filing policies can make it easier to locate important documents. No matter how much documentation is completed on computers, there will always be a portion that must be printed and filed by hand. Regardless of how detailed an office filing policy is, someone must be responsible for implementing it daily for it to be effective (Root, 2019). This is important as Yuee (2020) emphasized that losing important and sensitive data can have a significant impact on business operation. Backups ensure that at least one additional copy of important files can be easily restored if the originals are lost or damaged (Castagna, 2021). For instance, if computer crashes, a copy of document can be saved (Davis, 2021a).

The management of an institution's records determines its reliability and trustworthiness. As such, records must be stored in a safe environment that ensures accessibility and protects records from environmental damage (Kaboyo, 2019). According to Nabwami (2018), a well-kept record can protect the institution in situations where the legal defense of their actions is required. Documentation also ensures a level of professionalism and evidence of practice improvement.

## ***2.2. Quality of Service through Records Management in HEIs***

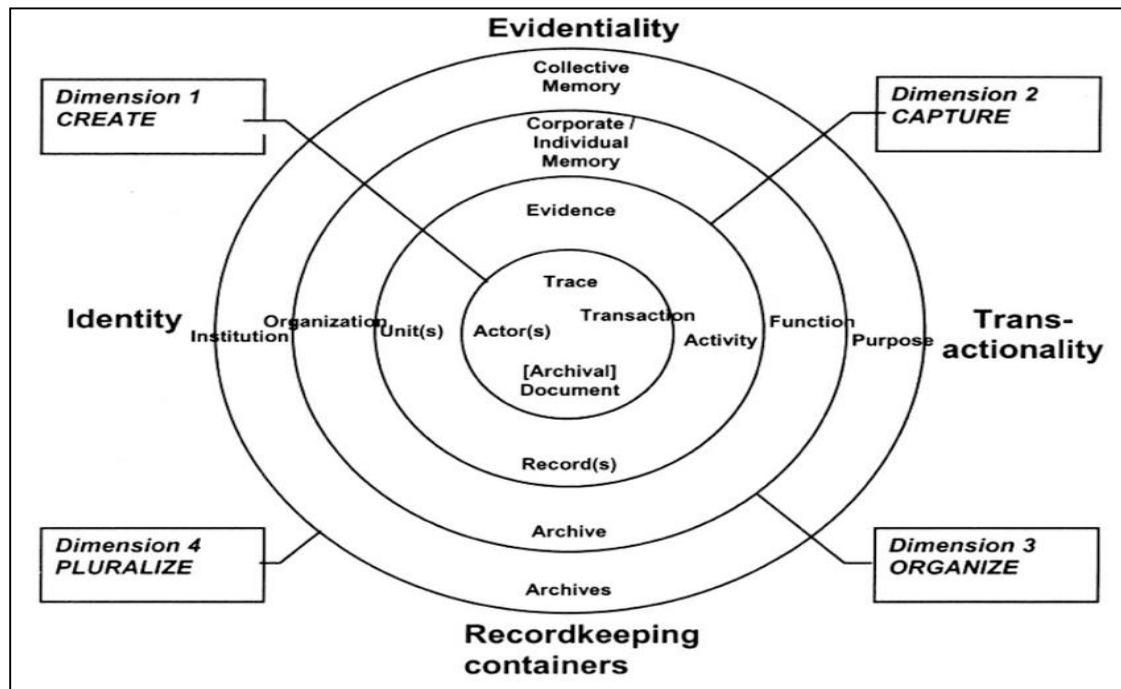
According to Hasbullah and Yusoff (2018), HEIs are more likely to strive for excellence in service quality because they are service-based organizations. Pamatmat et al. (2018) cited that service quality is a priced commodity and an equally important index for measuring client and stakeholder satisfaction. It is vital because it determines customer satisfaction (Davis, 2021b). As institution's success or failure is determined by its quality, loyal customer is a major determinant of an educational institution's long-term viability (Suparjo, 2018). Accordingly, student satisfaction has long been a key indicator of a university's ability to provide high-quality services.

With the increased competition in higher education, which now extends beyond borders, universities and colleges were prompted to prioritize quality service, which is directly related to student satisfaction and dissatisfaction (Sarsale, 2020). Furthermore, as a continuous process, regular training sessions and paying attention to what customers have to say about their experience are expected (Sherman, 2019). While there are numerous reasons for a university's administrative service quality to be prioritized: a student's first exposure to the university is through admissions and registrar's services, so providing high-quality service to students contributes to a positive impression of the university. The administrative departments of the university, such as the registration office, financial office, and library, are more likely to be replicas of governmental or public-sector bureaucratic units than academic units (Nazarian et al., 2012).

The purpose of records is to help managers perform better (Okoli & Onuigbo, 2014). Management functions are more likely to be simple and effective if records are kept and used properly. Office managers and administrators can also be more aware of their responsibilities and work more diligently toward the achievement of educational goals by keeping records. Moreover, in the view of Alegbeleye and Chilaka (2019), records management described as a constantly changing profession. This has ramifications for the skills and competencies required for record management. All employees involved in the management of records, from creation to destruction or preservation, should be trained on a regular basis. While records management necessitates those records designers and creators be given some level of training in records management, records professionals require an upgrade of the skills they use on a daily basis.

### ***2.3. Theoretical framework***

This study is anchored on the Records Continuum Theory developed by Frank Upward, an academic theorist at Monash University in Australia, with help from colleagues Sue Mckemmish and Livia Lacovino in the 1990s. As shown in figure 1, an abstract model represents record-keeping-related activity as an ongoing movement in and through four dimensions and four axes.

**Figure 1***Records Continuum Model by Frank Upward*

Source: "Information Technology, Archives and archivist- An Interacting Trinity for Long-term Digital Preservation," by M. Runardotter, 2007, Lulea University of Technology, p. 20. Copyright 2007 by Mari Cecilia Runardotter.

According to Williams (2006), records continuum is a consistent and coherent regime of management processes that spans from the creation of records (and even before that, within the design of the recordkeeping system) to the preservation and use of records as repositories. It recognizes that the processes in the traditional records management and traditional archival domains are (independently) similar: creating or receiving records, classifying, appraising, controlling, maintaining, and making them accessible. It claims that these processes are so intertwined, overlapping, and integrated – particularly but not exclusively in the electronic environment – that any distinction is counterproductive.

The records continuum model divides the organizational recordkeeping process into four dimensions – create, capture, organize, and pluralize – and four axes – evidentiality, transactionality, recordkeeping, and identity. The continuum model portrays record-keeping-based activity as a continuous movement in and through four dimensions and four axes when presented as a theory.

The axes represent the basic elements of demonstrating accountability: who did what (transactionality), what evidence exists (evidentiality), and how it can be retrieved from documents and archives (evidentiality) (record-keeping containers). Create, Capture, Organize (i.e., maintain up-to-date documents and archives), and Pluralize are four dimensions or layers that represent actions and documents created (i.e., make available as evidence of collective memory). As a result, the continuum approach views record-keeping as multidimensional, whereas the life-cycle approach views each stage as linear and distinct from the others. It implies that record keeping isn't time-based or sequential, and that record actions are fluid and possibly concurrent: a record can be accessed for both current and archival purposes at the same time, especially if it's in digital form.

Moreover, the study was also anchored as Parasuraman et al. (1988) developed a SERVQUAL instrument to measure service quality, which has five dimensions: reliability, responsiveness, empathy, assurance, and tangibles. The dimensions are also used in the educational sector in a variety of settings. For instance, Ahmed et al. (2010) used this model to assess the quality of university service and how that service relates to their performance. In relation, the findings of Khodayari and Khodayari (2011) proved that the SERVQUAL model is more relevant than other service quality models. In the last few decades, SERVQUAL has grown in popularity and application. The majority of studies on higher education service quality have focused on students' perceptions of quality, with little attention paid to academic and administrative staff perspectives.

### **3. Methodology**

The *quantitative-descriptive research* design was used as a method to draw out data that characterized the records management strategies and professional performance of the administrative staff. The study focused on the *convenience sampling technique* in gathering and distributing survey questionnaires to the participants at Laguna State Polytechnic University-San Pablo City Campus. Due to COVID-19 pandemic restrictions, the study focused on selecting only one university campus to conduct the survey. Out of the 80 total population, 59 were retrieved. Participants of the study belong to age brackets of 20 to 30 (53%), 31 to 40 (32%), 41 to 50 (10%), and 51 to 60 (5%); gender classified as 73% female and 27% male.

The research instrument used was a researcher-made survey questionnaire converted into a Google form for online distribution. The instrument was content validated by few consultants

and professors, including a subject matter expert and a statistician while the questionnaire's reliability was determined using Cronbach's alpha. Furthermore, the questionnaire included sections for records management strategies and professional performance, both of which had 5 items and were rated on a 4-point Likert scale.

The survey questionnaire was distributed to the administrative staff via email and Facebook messenger application through the supervision and approval of the university's human resource office. The survey questionnaire includes informed consent, respondents' right to data access, and information confidentiality and privacy, all of which are in compliance with the Philippine Data Privacy Act of 2012, or R.A. 10173, to protect the information that respondents provide before the data is used in the study.

The Pearson Product Moment Correlation Coefficient (Pearson  $r$ ) was utilized to determine the relationship between variables and the Analysis of Variance (ANOVA) was used also to test the difference.

## 4. Findings and Discussion

**Table 1**

*Summary of the Records Management Strategies*

Indicators	Mean	Interpretation
Filing Documents	3.59	Strongly Agree
Backup and Recovery of Files	3.44	Agree
Recording, Tracking, and Monitoring Documents	3.22	Agree

**Legend:** 1.00-1.49 (Strongly Disagree), 1.50-2.49 (Disagree), 2.50-3.49 (Agree), 3.50-4.00 (Strongly Agree)

Table 1 shows administrative staff's self-assessment of the records management strategies. In all indicators, filing documents were rated "strongly agree". It shows that filing as a strategy in records management was highly regarded by the administrative staff. Filing is one of the common

and simplest ways of managing records, which enables easier processing of documents and records.

Administrative staff agrees on backup and recovery of files with a mean of 3.44. It states that they can easily retrieve the documents or records they need, and that helped them to reduce time by preventing repetitions. It clearly states that administrative staff is using alternative mediums and devices for backup and storage of their files and records. Protecting against primary data loss or corruption requires storing a copy of data on a separate medium. Furthermore, the mean perception of the respondents in terms of recording, tracking, and monitoring documents is 3.22, which shows that administrative staff considers it easy to identify the current record version they are using and its location, which helps them to process records faster.

**Table 2**

*Summary of the Professional Performance*

<b>Indicators</b>	<b>Mean</b>	<b>Interpretation</b>
Quality of Service	3.67	Outstanding
Timeliness	3.65	Outstanding

*Legend: 1.00-1.49 (Strongly Disagree), 1.50-2.49 (Disagree), 2.50-3.49 (Agree), 3.50-4.00 (Strongly Agree)*

Table 2 represents the means on the professional performance of the administrative staff. It shows that quality of service got the highest mean of 3.67, which indicates that administrative staff focused on the quality of service as the primary measure of professional performance. Meanwhile, timeliness got a mean of 3.65, interpreted as outstanding, which implies that timeliness has a significant effect on the professional performance of the administrative staff. Ensuring timeliness of records, records issuance and records management ensure quality delivery of service provided to stakeholders.

**Table 3***Test of Difference on Records Management Strategies according to Age*

		Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Sig.	Interpretation
Filing documents	Between Groups	1.038	3	.346	2.404	.077	Not Significant
	Within Groups	7.912	55	.144			
	Total	8.949	58				
Backup and Recovery of Files	Between Groups	1.891	3	.630	3.820	.015	Significant
	Within Groups	9.075	55	.165			
	Total	10.965	58				
Recording, Tracking, and Monitoring Documents	Between Groups	1.581	3	.527	1.697	.178	Not Significant
	Within Groups	17.082	55	.311			
	Total	18.663	58				

**Legend:**  $p < .05$  = Significant;  $p > .05$  = Not significant

Table 3 shows the test of difference on the records management strategies of the respondents as grouped according to age, which shows the computed f-ratio of 2.404 and significant level of .077 for filing documents and f-ratio of 1.697 and a significant level of .178 for recording, tracking, and monitoring documents. This shows that there is no significant difference in the filing documents and recording, tracking, and monitoring documents on the records management strategies. This means the filing documents and recording, tracking, and monitoring documents strategies of the administrative staff have no significant difference according to their age. Regardless of their age, the staff employs similar strategy. This contradicts the premise of Laguador et al. (2014) that employees over the age of 40 have a higher sense of commitment to their jobs because their level of expertise in performing various tasks on a daily basis is significantly higher than that of young and middle-aged employees.

Meanwhile, backup and recovery of files, the computed f-ratio is 3.820 and a significant level of .015. This shows that there is a significant difference in backup and recovery of files as records management strategy of the respondents as grouped according to age. According to age of the employees, the backup and recovery of files strategies significantly differ. Due to the rising and emerging technology, millennials and generation X employees have wider knowledge on

backup and retrieval or recovery of records. This is the exact explanation of Borghans and Weel (2002) that lack of skills could hinder the digitalization of older workers' jobs, reducing the value of their existing skills. It turns out that older employees have fewer computer skills than younger employees.

**Table 4**

*Test of Difference on Records Management Strategies according to Gender*

		t-test for Equality of Means				
		t	Degrees of Freedom (df)	Sig. (2-tailed)	Mean Difference	Interpretation
Filing Documents	Equal variances assumed	.135	57	.893	.01570	Not Significant
Backup and Recovery of Files	Equal variances assumed	-.063	57	.950	-.00814	Not Significant
Recording, Tracking, and Monitoring Documents	Equal variances assumed	.344	57	.732	.05756	Not Significant

**Legend:**  $p < .05$  = Significant;  $p > .05$  = Not significant

Table 4 signifies the independent samples test (t-test for Equality of Means) on the records management strategies of the respondents as grouped according to gender. For the filing documents, the t-value of .135 and p-value (*Sig. 2-tailed*) of .893. For backup and recovery of files, t-value of -.063 and p-value of .950 while t-value of .344 and p-value of .732 for recording, tracking, and monitoring documents. It is revealed that filing documents, backup, and recovery of files and recording, tracking, and monitoring documents records management strategies of administrative staff are similar regardless of their gender. Both male and female administrative staff employ the same strategies in filing documents, backup, and recovery of files and recording, tracking, and monitoring documents.

Table 5 indicates the test of difference on records management strategies of the respondents as grouped according to job tenure, which shows the computed f-ratio of .615 and significant level of .654 for backup and recovery of files while f-ratio of 2.044 and significant level of .101 for recording, tracking, and monitoring documents.



**Table 5***Test of Difference among Records Management Strategies as grouped according to Job Tenure*

		Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Sig.	Interpretation
Filing Documents	Between Groups	1.981	4	.495	3.837	.008	Significant
	Within Groups	6.969	54	.129			
	Total	8.949	58				
Backup and Recovery of Files	Between Groups	.478	4	.119	.615	.654	Not Significant
	Within Groups	10.488	54	.194			
	Total	10.965	58				
Recording, Tracking, and Monitoring Documents	Between Groups	2.454	4	.613	2.044	.101	Not Significant
	Within Groups	16.209	54	.300			
	Total	18.663	58				

**Legend:**  $p < .05$  = Significant;  $p > .05$  = Not significant

This represents no significant difference in the backup and recovery of files and recording, tracking, and monitoring documents as records management strategies; new and old staff employ the same strategies. However, in filing documents, the computed f-ratio is 3.837 with a significant level of .008. This indicates significant difference in the filing documents as records management strategy. This means the longer the staff or employees work in an organization, the more knowledge, and skills they develop in filing records.

The results coincide with the explanation of Ng and Sorensen (2008) that employees with more experience were more familiar with their job roles and may have attained a higher level of career achievement than newer employees, allowing them to perform much better on the job. In terms of documents filing, it seems clear that mastery of the task is evident. As documents filing is routinely, Brauchle and Azam (2004) in their study showed that employees who have worked for a long time have better performance.

Table 6 represents the test of difference on the records management strategies of the respondents according to job position in the department, which shows the computed f-ratio of 1.697 and significant level of .178 for backup and recovery of files while f-ratio of 1.071 and significant level of .369 for recording, tracking, and monitoring documents. This shows no significant difference in the backup and recovery of files and recording, tracking, and monitoring

documents as records management strategy in relation to any job position. Meanwhile, on filing documents, the computed f-ratio is 4.676 with a significant level of .006. This shows significant difference in the filing documents as records management strategy in relation to a specific job position in the department. The results indicate that different job position requires different filing document system.

**Table 6**

*Test of Difference on Records Management Strategies according to Job Position*

		<b>Sum of Squares</b>	<b>Degrees of Freedom (df)</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Interpretation</b>
Filing Documents	Between Groups	1.819	3	.606	4.676	.006	Significant
	Within Groups	7.131	55	.130			
	Total	8.949	58				
Backup and Recovery of Files	Between Groups	.929	3	.310	1.697	.178	Not Significant
	Within Groups	10.036	55	.182			
	Total	10.965	58				
Recording, Tracking, and Monitoring Documents	Between Groups	1.030	3	.343	1.071	.369	Not Significant
	Within Groups	17.633	55	.321			
	Total	18.663	58				

**Legend:**  $p < .05$  = Significant;  $p > .05$  = Not significant

The significant difference reflects the findings of Roushka (2012) and Koontz and O'Donnell (2008). Depending on the nature of the job, there are relevant differences in the manner of filing documents. For instance, computer-aided positions tend to have digital records than positions that are paper-based records. Similarly, Yossef and Rakha (2017) emphasized on the creativity of the administrative staffs. They may employ similar system but has different process of filing documents.

**Table 7**

*Test of Difference on Professional Performance according to Age*

		<b>Sum of Squares</b>	<b>Degrees of Freedom (df)</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>	<b>Interpretation</b>
Quality of Service	Between Groups	.825	3	.275	1.941	.134	Not Significant
	Within Groups	7.796	55	.142			
	Total	8.621	58				
Timeliness	Between Groups	.797	3	.266	1.618	.196	Not Significant
	Within Groups	9.030	55	.164			
	Total	9.826	58				

**Legend:**  $p < .05$  = Significant;  $p > .05$  = Not significant

Table 7 shows the test of difference on the professional performance of the respondents as grouped according to age with the computed f-ratio of 1.941 and a significant level of .134 for quality of service while f-ratio of 1.618 and significant level of .196 for timeliness. This revealed no significant difference on the quality of service and timeliness as measure of the professional performance according to age. This means the quality of service and timeliness of the respondents are equally the same regardless of their age. This contradicts the findings of Kim and Kang (2016) that older workers have more positive attitudes toward their jobs, experience fewer negativity, and characterize their workplace more favorably than their younger peers. It also contradicts the studies of Inceoglu et al. (2012) and Kooij et al. (2011) that younger and older employees rate the attractiveness of certain job features differently.

**Table 8**

*Test of Difference on Professional Performance according to Gender*

		t-test for Equality of Means				
		t	Degrees of Freedom (df)	Sig. (2-tailed)	Mean Difference	Interpretation
Quality of Service	Equal variances assumed	.105	57	.917	.01192	Not Significant
Timeliness	Equal variances assumed	.901	57	.372	.10872	Not Significant

**Legend:**  $p < .05$  = Significant;  $p > .05$  = Not significant

Table 8 presents the independent samples test (t-test for Equality of Means) on the professional performance of the respondents as grouped according to gender. The quality of service has t-value of .105 and p-value (*Sig. 2-tailed*) of .917 while timeliness has t-value of .901 and p-value of .372. These results show no significant difference on professional performance of the respondents regardless of their gender. Both genders have equally same professional performance in terms of quality of service and timeliness. This is similar to the results of Deligero and Laguador (2014) that male and female employees in the universities demonstrate the same level of work performance.

Table 9 represents the test of difference on the professional performance of the respondents according to job tenure. For the quality of service, the computed f-ratio is .810 and a significant level of .524. For the timeliness, the computed f-ratio is .522 and a significant level of .720. These

indicate no significant difference on the professional performance according to job tenure. Both new and old administrative staff have the same level of professional performance.

**Table 9**

*Test of Difference on Professional Performance according to Job Tenure*

		Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Sig.	Interpretation
Quality of Service	Between Groups	.488	4	.122	.810	.524	Not Significant
	Within Groups	8.133	54	.151			
	Total	8.621	58				
Timeliness	Between Groups	.366	4	.091	.522	.720	Not Significant
	Within Groups	9.461	54	.175			
	Total	9.826	58				

**Legend:**  $p < .05$  = Significant;  $p > .05$  = Not significant

This results contradicts the studies of Kalaw (2014) and Deligero and Laguador (2014) that longer work experience has relevance to the quality of the work performance. This study asserts that both the new and old employees similarly perform their tasks. This could be attributed to the similar process, procedures and policies.

**Table 10**

*Test of Difference on Professional Performance according to Job Position*

		Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Sig.	Interpretation
Quality of Service	Between Groups	1.249	3	.416	3.105	.034	Significant
	Within Groups	7.372	55	.134			
	Total	8.621	58				
Timeliness	Between Groups	.690	3	.230	1.385	.257	Not Significant
	Within Groups	9.136	55	.166			
	Total	9.826	58				

**Legend:**  $p < .05$  = Significant;  $p > .05$  = Not significant

Table 10 shows the test of difference on the professional performance of the respondents as grouped according to job position in the department, which shows the computed f-ratio of 3.105 and significant level of .034 for quality of service indicating a significant difference on the

professional performance of the respondents. The results indicate that there is statistical difference in the professional performance of employees depending on their job position.

This coincides with the explanation of Moreno-Romero et al. (2016) that job position is related to productivity. Moreover, holding the same position and repeating the process is beneficial to many employees. As explained by Abuhashesh et al. (2019), repetitive and same regular work performance over the years improve the overall employee performance.

However, timeliness shows computed f-ratio of 1.385 and a significant level of .257 resulting to a no significant difference. The timeliness on the performance of the respondents is same for all the job positions.

**Table 11**

*Test of Relationship between Records Management Strategies and Professional Performance*

		Quality of Service	Timeliness
Filing Document	Pearson Correlation	.598**	.563**
Backup and Recovery of Files	Pearson Correlation	.577**	.622**
Recording, Tracking, and Monitoring Documents	Pearson Correlation	.442**	.501**

\*\*Correlation is significant at the 0.01 level (2-tailed)

Table 11 indicates the test of the relationship between records management strategies and professional performance using the Pearson-r Correlation Coefficient. On filing documents, the computed Pearson Correlation value for the quality of service is .598 and timeliness is .563. For backup and recovery of files, the computed Pearson Correlation value is .577 for quality of service and .622 for timeliness and for recording, tracking, and monitoring documents, the computed Pearson Correlation value for the quality of service is .442, and .501 for timeliness.

Overall, it signifies that records management strategies have a positive significant relationship with the professional performance of the respondents. As a result, it indicates that records management strategies influenced the professional performance of an employee in the organization. The strategies indicated influenced the performance of an employee.

The results are parallel to the findings and explanations of Luyombya and Ndagire (2020), Tagbotor et al. (2015) and Okoli and Onuigbo (2014). The ability of the higher education

institutions to develop and adopt records management procedures to assist staff in managing records determines the effectiveness of service delivery. It is relatively clear that records management contribute significantly to an employees' work performance and institutional performance. It supports the empirical evidence that records keeping in tertiary institutions improves management performance.

## **5. Conclusion**

The relationship between records management strategies and professional performance of the 59 administrative staff at Laguna State Polytechnic University-San Pablo City Campus was examined using descriptive research. The researcher-designed questionnaire was utilized in assessing records management strategies on filing documents, backup, and recovery of files, and recording, tracking, and monitoring documents, and professional performance in terms of quality of service and timeliness. For data analysis, frequency count, weighted mean, ANOVA, and Pearson – r were employed.

Based on the results, the administrative staff agrees on filing documents, backup and recovery of files, and recording, tracking, and monitoring documents as the records management strategies. Meanwhile, the administrative staff rated themselves with outstanding professional performance in terms of quality of service and timeliness. The results further showed a significant difference in the records management strategies as to employees' age, gender, job tenure, and job position. However, no significant difference in the professional performance as to the employees' age, gender, job tenure, and job position. The results also confirmed that filing documents, backup and recovery of files, and recording, tracking, and monitoring documents highly influenced the professional performance of an employee in the organization or institution.

The findings contribute to the university and the administration in enhancing its records management policies, procedures, and strategies. To meet the needs and requirements of clients and stakeholders, it is recommended that service quality be sustained. Henceforth, providing ongoing training programs for administrative staff in regard to good records management and ongoing implementation of evaluation and assessment will be beneficial in terms of expanding and upholding their professional proficiencies in the institution.

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# Internal Stakeholders' Evaluation of the Philippine National Police Electronic – Project Systems

<sup>1</sup>Grace D. Alincaestre & <sup>2</sup>Wilfredo D. Dalugdog

## Abstract

The study aimed to evaluate the implementation, and problems encountered in the implementation of Philippine National Police Electronic – Project Systems in Lipa City Batangas. The descriptive research design was used employing a self-made survey questionnaire distributed purposively to 120 internal stakeholders as the respondents of the study. The basic statistical tools were used to interpret and analysed the data gathered. The study revealed that e-Subpoena, e-Gallery, e-Warrant System, and e-Blotter Report are implemented in Lipa City, Batangas within the indicators of an effective implementation plan. However, the study also revealed that the stakeholders encountered serious problems in the implementation of PNP's e-Project Systems within the bounds of the criteria used. This study asserts that although the PNP's e-Project Systems in Lipa City Batangas are implemented, the regular conduct of capability building is necessary for the monitoring, supervision and management of the project.

**Keywords:** *Blotter Report, Electronic Project System, Philippine National Police, Rouges Gallery, Subpoena, Warrant System*

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## About the authors:

<sup>1</sup>College of Criminal Justice, Kolehiyo ng Lungsod ng Lipa- Lipa City, Philippines

<sup>2</sup>College of Criminal Justice Education, Laguna State Polytechnic University – Siniloan Campus, Philippines



## 1. Introduction

The Philippine National Police (PNP) traditionally used manual reporting to register a complaint against a person. To report the incidents, the complainant must go to the nearest police station. However, the process becomes tedious to both the stakeholder and the personnel. As such, the PNP starts to use technology to speed up the resolution of crime detection and to provide the National Headquarters with an awareness of non-performing units within the PNP Police Force. The PNP is implementing the electronic-blotter report (e-blotter report), the electronic-rouges gallery (e-rouges gallery), the electronic-warrant system (e-warrant system), and the electronic-subpoena (e-subpoena) with a view of facilitating, centralizing, and making crime reporting available to everyone. According to Ward (2016), countries without e-warrants out-performed the countries with e-warrants for every case type.

The e-blotter report is used by police stations in the province of Batangas cities and municipalities. The PNP is currently working on the improvement of the e-Blotter Report so that it can interface with a Geographic Information System (GIS) framework capable of geospatial time series analysis and provide multi-functional features such as data visualization, add more crime patterns, and produce data/report in just a matter of minutes. The improved e-Blotter Report would also be capable of incorporating or accessing data from various PNP e-projects. These changes will improve the capacity of field commanders to perform qualitative crime research more effectively and more precisely (DIDM, 2015). Victims and witnesses always give priority to their safety and privacy. This is one of the major concerns why victims are not reporting crimes as well as social status also do a great impact on victims (Jayasinghe & Perera, 2021; Sorote, 2011; Sevidal, 2011).

The core objective of the enhanced e-blotter is to serve as a scientific management tool for efficient and effective prescription of police intervention, specifically to: serve as a crime database; identify crime hot spots along with other trends and patterns; use of spatial (space) and time series analysis; generate-graph/data in just a matter of minutes; establish comprehensive, adequate and timely information on crimes from manual and antiquated to computerized and integrated crime reporting system; interface with the e-rouges gallery and the e-warrant system; overlay other data sets-localities; AORs, critical facilities and structures, troop deployment and movement; and build a robust IT infrastructure to support the entire system (DIDM, 2012).

On the other hand, the e-rouges gallery is a gallery of wanted persons, which gives every police station access to the criminal backgrounds that are stored in the country's police units. Through the PNP e-Rouges Gallery, the records of a person or wanted person for a crime in one location can be immediately accessed by a police station in another location with just a click of their fingertips on the machine. The e-Rouges Gallery has been revamped to increase the resolution of mug shots being posted. Among the changes to the system was the addition of counters to decide which units access and download data system (DIDM, 2015; DIDM, 2012).

The e-warrant system is a system where all warrants of arrest will be electronically documented so that they can be accessed through computers. Likewise, the e-warrant eliminates the hassle of bugging the snail mail system of delivering a warrant to a particular police station. The warrant accessed by police through the system will facilitate the apprehension of a criminal because a warrant can be sent by email, printed out, and served. The warrant although not the original, but a faithful digital copy thereof, will facilitate the apprehension of a criminal because of the knowledge by the arresting officer that a warrant is pending for the former's arrest. The e-warrant system is a program that connects all the police stations and has been proven to be a valuable resource in catching criminals. The e-warrant project is an electronic database on a warrant of arrest that could be used by the PNP nationwide to verify, appropriately act on and promptly disclose information to the concerned law enforcement agencies (DIDM, 2015; DIDM, 2012).

The e-subpoena was developed through the Memorandum of Agreement signed between the PNP, Supreme Court, and Department of Justice. It aims for the cost-effective delivery of subpoenas and other court documents to the PNP units. Since everything is accomplished online, the cost for paper and courier is no longer a burden while there will be no more delays, and the records are easily within reach (DIDM, 2012). The Judicial Courts shall send the various subpoenas to particular PNP units through an e-mail and the Chief of Police (COP) shall ensure that the documents are delivered and received by the concerned personnel on time. The Crime Registrar shall encode details of the subpoena for its compliance in the court duties monitoring system. The DIDM shall monitor all reports needed and prepare necessary reports for the Courts (DIDM, 2015; DIDM, 2012).

Meanwhile, capacity building for the two hundred thirty-four police officers with basic computer knowledge participated in the five-day Electronic - Rogues' Gallery and Electronic - Warrant System's Training held at Camp Alagar, Lapanan, Cagayan De Oro City on February 1, 2013. The training is focused on the electronic-rogues' gallery, or the electronic rogues' gallery database is a photo gallery of wanted criminals and other suspected law offenders posted online for easy reference by investigators and tracker teams (Cariaga, 2013).

The National Headquarter of the Philippine National Police, Office of the Chief, PNP, Camp Crame, Quezon City have issued a PNP Memorandum Circular No. 2015 – 032 with the subject title “Duties and Responsibilities of Non-Uniformed Personnel (NUP) appointed as Crime Registrars and Radiophone Operators (Under the 7,439 New NUP Positions). This circular is rationalized to reinforce the PNP's program to “field more policemen on the streets.” These NUPs are supposed to take over the administrative tasks of policemen who will be deployed on the streets to increase police presence and enhance the PNP's anti-crime efforts. However, there are reports that many police stations have assigned these NUPs to administrative works that are not related to their job descriptions, others were allegedly tasked to work beyond the prescribed 8-hour work a day, and even during weekends and holidays. Worst, some are being utilized in law enforcement operations. These practices defeat the very purpose why this NUP was hired and also violate certain provisions of the Civil Service Laws, RA No. 8551, and other pertinent policies, rules and regulations hence, the need to come up with this Memorandum Circular.

Based on the Memorandum Circular No. 2015 – 032, during the 2013 SONA of His Excellency President Benigno S Aquino III (HEPBSA III), he announced the hiring of 15, 000 NUP to be assigned as Crime Registrars and Radiophone Operators in the regional, provincial, and city police offices as well as city/municipal police stations as part of the government's program to enhance or maximize police presence with the assignment of more uniformed personnel in the field. Clearly, for all its intent and purposes, the approval of 7,439 (first batch) from the proposed 15,000 additional NUP positions were intended for efficient and optimized delivery of basic police services to the community through an enhanced capability of the police force to solve crimes and arrest more criminals. Based on the study conducted by Escalona (2020), the PNP Laoag City Police Station has strongly implemented the e-blotter, case information and database management system, e-subpoena system, and e-rouge gallery system.



This study evaluated the implementation of the PNP Electronic-Project Systems in Lipa City, Batangas, in terms of e-blotter report, e-rouges gallery, e-warrant system, and e-subpoena. It also identified the problems encountered in its implementation. The study tests the following hypothesis:

Ho1: There is no significant relationship between the internal stakeholders' evaluation and problems encountered in the implementation of PNP Electronic-Project Systems in Lipa City, Batangas.

## **2. Literature review**

The PNP's E-Project System is one of the new technologies acquired by the Philippine National Police for an easy recording of incidents but cannot be forged and accessible to all stations in the Philippines. This technology can also help in analyzing and interpreting crime incidents in the Philippines. Computerized crime mapping technology enables law enforcement agencies to analyze and correlate data sources to create a detailed snapshot of crime incidents and related factors within a community or other geographical area (Mamalian, 2014). Based on the survey findings conducted by the Crime Mapping Research Center (CMRC), the CMRC will further develop its understanding of how law enforcement agencies use GIS software and the types of maps they produce. The CMRC will then identify training and technical assistance needs, further develop crime mapping resources, and disseminate information to researchers and practitioners.

The Crime Information Reporting and Analysis System (CIRS) used by the Philippine National Police is similar to the computerized crime mapping used by law enforcement agencies abroad. Computerized crime mapping allows law enforcement agencies to plot crime-related data against a digitized map of a community, city, or region. Crime-related data then can be compared and analyzed with other external data sources. Half of the departments that use computerized mapping report using such external sources as census data, city planning data, parks information, property assessment data, utility information, and other data sources in conjunction with their crime data. This suggests that many departments consider spatial relationships between crime and other community-related characteristics (Mamalian et al., 2014).

Crime incident data can be geocoded (assigning an x and y coordinate to an address so it can be placed on a map) by using either street centerlines (Every address within a block is encoded) or parcels (each piece of land that can be bought or sold is encoded). The majority of departments

reported using street centreline reference files for geocoding and crime mapping. Many departments also reported using parcel database reference files for geocoding and crime mapping (Mamalian et al., 2014).

Information and Communications Technology (ICT) have been used by different Governments organizations to promote participation with its citizens. Through M-government or Mobile-Government, citizens can make urban incident reports in their neighborhood to the local administration. In this context, citizens can use incident reporting tools that permit communication with the local administration. Although most M-government applications concern an urban environment such as traffic jams, parking availability in town among others, applications have been used even in rural areas (Edillo et al., 2017).

One of the capstone projects conducted in San Juan Police Station, the Philippines by Ledesma et al. (2013), to assist the Philippine National Police to improve their services through the use of technology to further contributes to the pieces of literature on policing and crime monitoring. Ledesma et Al. (2017), applied the Rapid Application Development (RAD) methodology in their study. The different phases of software development of the RAD methodology are Requirements Planning, User Design, Construction, and Cutover Phases. They developed the system using the two main features: the centralized blotter system and integrated crime control system. The centralized blotter system captures vital information of a crime when it is being reported. Documents provided by the complaint can be uploaded into the system. This system was patterned from existing Blotting systems and the actual practice of the precinct. All necessary documents such as an incident report, endorsement letters, and affidavits can be printed using the system. Tracking of the status of the complaints can be performed with the system (Ledesma et. al, 2017). Likewise, the integrated crime control system includes crime mapping. Since the blotter records have the information regarding the crime's time, date, and place of incident, these blotter records saved into the database will be plotted to determine where crimes are usually happening. Every type of crime will have its color coding for representation and the number of crimes that occur in a specific place. The plotting of the crime map will be on a barangay basis. In addition, there will also be a filtered option to be able to view the map by time, by crime, or both by crime and time. There will be a plotting of a crime that happened in a specific place after the recording of the blotter is done to be visible to both the police and the community. There will be differences in the details and information that will be shown to the community and the police. In the community, the plotting of crimes will only show but it is in real-time. While in the

police side, there will be decision support to help the tactical officer in decision making when it comes to allocating of policemen (Ledesma et. al, 2017).

Electronic warrants (e-warrants) provide a mechanism for officers to obtain accurate blood alcohol concentration (BAC) or toxicology results promptly. These systems can significantly streamline the arrest process, allowing officers to complete requests in their patrol cars on tablets, smartphones, or computers. This practice reduces the amount of time that officers are off the street and the amount of time between the request, approval, and execution of the warrant. The use of an e-Warrant system, in which electronic transmission of the warrant affidavit and judicial approval is done through an online information management system, further streamlines the process (Borakove & Banks, n.d.).

The Supreme Court and the PNP rolled out the enhanced e-warrant system that fully automates the issuance of arrest warrants across the country. This system aims to fully automate the issuance of arrest warrants and would, in turn, speed up the service of law enforcement agencies. The enhanced e-warrant system “*is set to operate as an online database of warrants of arrest, providing real-time updates on the status of warrants and specific actions taken by law enforcement agencies*”. It aims to cover around 2,600 courts and 1,900 police stations across the country. After the court finds probable cause to issue a warrant, details will be encoded to and generated by the enhanced e-warrant system; data of which will be instantaneously transmitted to the police station that holds jurisdiction over the accused and where the complaint was filed (Patag, 2020).

### **3. Methodology**

#### ***3.1. Research Design***

The study used the descriptive research design employing a self-made survey questionnaire to evaluate the implementation of PNP’s Electronic - Project Systems, with regards to e – Roques Gallery, e – Warrant System, e – Blotter Report, and e -subpoena in Lipa City Batangas.

#### ***3.2. Respondents and Sampling Technique***

There were 120 respondents of this study composed of police investigators, crime registrar, and other concerned PNP personnel in Lipa City Police Station. The purposive sampling technique

was used in selecting the respondents of this study. The study used the fixed criteria to identify and select the respondents. First, the respondents must be knowledgeable to operate the PNP's e-project systems. Second, more than a year in the service and have undergone a training/seminar about the PNP e-project systems, and third, willing to take part in this study.

The respondents of the study were composed of 24 police investigators, 8 crime registrars, and 88 other PNP personnel of Lipa City Police Station. Most of these respondents are from the age bracket of 26-30 years old, male, and college graduates with 6-10 years in the service.

### ***3.3. Research Instrument***

The study used the researcher-made survey questionnaire. This structured survey questionnaire was based on the reviews of existing literature and results of previous studies composed of two parts: the first part is the evaluation of the implementation of PNP's e - project systems with regards to e-rogues' gallery, e-warrant system, e -blotter report, and e -subpoena, while the second part is the problems encountered in the implementation of the project. The survey questionnaire was content-validated by the police investigator and crime registrar personnel.

### ***3.4. Data Gathering Procedure***

The survey was personally administered and distributed to the respondents with the permission of the Chief of Police of the Philippine National Police Lipa City, Province of Batangas through an official request letter. The objectives of the study were clearly explained before the questionnaires were handed out. In addition, it was reiterated to the respondents that the survey is voluntary and they can withdraw from the survey at any time. Respondents were also informed on the confidentiality of the data gathered and their personal information remain undisclosed. The survey questionnaire was retrieved after the respondents completed answering on the same day.

### ***3.5. Statistical Analysis***

The basic statistical tools such as frequency count and weighted mean were used to interpret and analyze the data gathered. Likewise, Pearson r was used to test the hypothesis of this study.

## 4. Findings and Discussion

**Table 1**

*Evaluation of the PNP Electronic – Project Systems in Lipa City Batangas*

Indicators	Mean	VI
<b>e-Rouges Gallery</b>		
1. Printing of wanted persons becomes less.	3.19	I
2. There is an accessible picture of wanted persons in every police station in the Philippines.	3.37	FI
3. Every police officer/personnel can access the e-Rouges Gallery.	2.95	I
4. There is a clear and accurate picture of a wanted person.	3.28	FI
5. Electronic rouges gallery is updated from time to time.	3.16	I
6. Information about the pictures of a wanted person is complete and accurate.	3.25	I
<b>GENERAL MEAN</b>	<b>3.23</b>	<b>I</b>
<b>e-Warrant System</b>		
1. Internet access is fast.	3.22	I
2. The hassle of bugging the snail mail system to send a warrant to a specific police station.	3.14	I
3. Apprehension of the criminal is facilitated since the warrant can be submitted via email, printed out, and served.	3.23	I
4. Criminal apprehension is encouraged when the arresting officer suspects that a warrant for the detention of the former is outstanding.	3.33	FI
5. There is complete and accurate information about the person to be arrested.	3.33	FI
<b>GENERAL MEAN</b>	<b>3.27</b>	<b>FI</b>
<b>e-Blotter Report</b>		
1. Voluminous paper reports received on a day-to-day basis are lessened.	3.27	FI
2. Stocking record of the traditional blotter report is minimized.	3.18	I
3. There is more buying of commercial crime maps.	2.96	I
4. There is less printing of wanted persons.	3.11	I
5. Reported crime incidents are accessible to the community.	3.18	I
<b>GENERAL MEAN</b>	<b>3.17</b>	<b>I</b>
<b>e-Subpoena</b>		
1. Subpoena can be forwarded from one station to another or from provincial police to the station police through an email.	3.34	FI
2. The cost of subpoena document and messenger is no longer a burden	3.15	I
3. There are no more delays in the arrival of a subpoena.	3.23	I
4. The records of the subpoena are easily within reach.	3.28	FI
5. The Courts shall submit the various subpoenas to specific PNP Units by e-warrant, and the chief of Police shall ensure that the papers are sent and processed by the personnel concerned on time.	3.33	FI
<b>GENERAL MEAN</b>	<b>3.25</b>	<b>FI</b>

**Legend:** 4.00 – 3.26 Fully Implemented (FI); 3.25 – 2.51 Implemented (I); 2.50 – 1.76 Less Implemented (LI); 1.75 – 1.00 Not Implemented (NI)

Table 1 presents the internal stakeholders' evaluation of the of the PNP e-project systems' implementation. The survey findings revealed that items 2 and 4, "*there is an accessible picture of wanted persons in every police station in the Philippines*", and "*there is a clear and accurate picture of a wanted person*" obtained weighted means of 3.37 and 3.28, respectively, with the verbal interpretation of *fully implemented*. The full implementation determines that e-rouges gallery had an accessible picture of wanted persons in every police station in the Philippines, and these pictures are clear and accurate pictures of wanted persons. Meanwhile, items 1, 3, 5, and 6, "*printing of wanted persons becomes less*", "*every police officer/personnel can access the e-Rouges Gallery*", "*electronic rogues' gallery is updated from time to time*", and "*information about the pictures of a wanted person is complete and accurate*" obtained weighted means of 3.19, 2.95, 3.16, and 3.25, respectively, with the verbal interpretation of *implemented*. It is evident that the implementation of e-rouges gallery, the printing of wanted persons becomes less. In general, the e-rouges gallery is implemented with a general weighted mean of 3.23. This means that the PNP Batangas Police Station is implementing with limitations the e-rouges gallery.

The implementation of the e-rouges gallery fits the description of Escalona (2020) that every police station in the country has access to data on criminals including pictures. It also coincides with the explanation of Long (2017) that the implementation of electronic system enables faster and efficient performance of duties to lessen the crime occurrences.

With regards to the implementation of the e-warrant system, the survey findings revealed that items 4 and 5 "*criminal apprehension is encouraged when the arresting officer suspects that a warrant for the detention of the former is outstanding*" and "*there is complete and accurate information about the person to be arrested*" both have obtained a weighted mean of 3.33, with a verbal interpretation of *fully implemented*. It is attributed to the Supreme Court and Philippine National Police rolling out the enhanced e-warrant system that fully automates the issuance of arrest warrants across the country. Meanwhile, items 1, 2, and 3, "*internet access is fast*", "*the hassle bugging snail mail system to send a warrant to a specific police station*", and "*apprehension of the criminal is facilitated since the warrant can be submitted via email, printed out, and served*" obtained weighted means of 3.22, 3.14, and 3.23, respectively, with a verbal interpretation of *implemented*. In general, the e-warrant system is fully implemented with a general weighted mean of 3.27.

With regards to the implementation of the e-blotter report. The findings revealed that item 1 "*voluminous paper reports received on a day-to-day basis are lessened*" obtained a weighted

mean of 3.27, with the verbal interpretation of *fully implemented*. It means the voluminous paper reports received on a day-to-day basis are lessened due to the full implementation of the e-blotter report. In addition, items 2, 3, 4, and 5, “*stocking record of the traditional blotter report is minimized*”, “*there is more buying of commercial crime maps*”, “*there is less printing of wanted persons*”, and “*reported crime incidents are accessible to the community*”, obtained weighted means of 3.18, 2.96, 3.11, and 3.18, respectively, with the verbal interpretation of *implemented*. Overall, the e-blotter report is likewise implemented with a general weighted mean of 3.17.

In terms of the implementation of e-subpoena, the stakeholders rated the items 1, 4, and 5, “*subpoena can be forwarded from one station to another or from provincial police to the station police through an email*”, “*the records of the subpoena are easily within reach*”, and “*the courts shall submit the various subpoenas to specific PNP units by e-warrant, and the chief of police shall ensure that the papers are sent and processed by the personnel concerned on time*” with weighted means of 3.34, 3.28, and 3.33, respectively, with the verbal interpretation of *fully implemented*. The items 2, and 3, “*the cost of subpoena document and messenger is no longer a burden*”, and “*there are no more delays in the arrival of a subpoena*” obtained weighted means of 3.15 and 3.23, respectively, with the verbal interpretation of *implemented*. Overall, the e-subpoena system was fully implemented with a general weighted mean of 3.25.

The data revealed herein provided evidence that the PNP Lipa City Batangas has successfully complied with the provisions and the mandates of the PNP Memorandum Circular Number 2014-016, National Police Commission (2014) and Memorandum Circular No. 2015 – 032. Similarly, the internal stakeholders’ evaluation affirmed the findings of Patag (2020) and Ward (2016) that the e-warrants improves performance; Brainscape (2022) that e-warrant system eliminates the hassle; and Caliwán (2018) that e-subpoena enables the courts to send electronic subpoenas by email.

Table 2 shows the problems encountered in the implementation of Philippine National Police Electronic-Project Systems in Lipa City Batangas in terms of e-Rouges Gallery, e-Warrant System, e-Blotter Report, and e-Subpoena.

**Table 2***Problems encountered in the implementation of PNP Electronic – Project Systems in Lipa City Batangas*

Indicators	WM	VI
<b>e-Rouges Gallery</b>		
1. Concerned officers/personnel assigned are not trained to operate it.	2.82	S
2. The limited number of officer/personnel assigned and trained to operate it.	3.02	S
3. E-Rouges Gallery cannot be easily updated from time to time.	2.83	S
4. Unclear pictures and inaccurate information.	3.1	S
5. Pictures of wanted persons are not accessible to the community.	2.9	S
<b>GENERAL MEAN</b>	<b>2.93</b>	<b>S</b>
<b>e-Warrant System</b>		
1. There is unclear and inaccurate information.	3	S
2. Concerned officers/personnel assigned are not trained to operate it.	2.91	S
3. E-warrant cannot be easily updated from time to time.	2.94	S
4. It cannot be used by the arresting officer or police officer	2.97	S
<b>GENERAL MEAN</b>	<b>2.96</b>	<b>S</b>
<b>e-Blotter Report</b>		
1. Paper reports received on a day-to-day basis are still in practice.	2.86	S
2. Stocking record of the traditional blotter report is conducted as usual.	2.97	S
3. Buying commercial crime maps is still in practice.	2.78	S
4. Printing of wanted persons is still the same.	2.81	S
5. Police officers can still tamper with the police records.	2.77	S
6. Reported crime incidents are inaccessible to the community.	2.78	S
<b>GENERAL MEAN</b>	<b>2.83</b>	<b>S</b>
<b>e-Subpoena</b>		
1. Subpoena cannot be forwarded from one station to another or from provincial police to the station police through email.	2.79	S
2. The cost of subpoena and messenger is still a burden.	2.86	S
3. There are delays in the arrival of a subpoena.	2.80	S
4. The records of a subpoena cannot easily be within reach.	2.82	S
5. The Courts cannot give numerous subpoenas to specific PNP units via e-mail, and the Chief of Police could not be guaranteed that the papers were sent and obtained by the staff involved on time.	2.83	S
<b>GENERAL MEAN</b>	<b>2.82</b>	<b>S</b>

**Legend:** 4.00 – 3.26 Very Serious (VS); 3.25 – 2.51 Serious (S); 2.50 – 1.76 Less Serious (LS); 1.75 – 1.00 Not Serious (NS)

With regards to the problems encountered in the implementation of e-rouges gallery, the survey findings revealed that items 4, 2, 5, 3, and 1, *unclear pictures and inaccurate information, the limited number of officer/personnel assigned and trained to operate it, pictures of wanted persons are not accessible to the community, e-Rouges Gallery cannot be easily updated from time to time, and concerned officer/personnel assigned are not train to operate it*, obtained weighted



means of 3.1, 3.02, 2.9, 2.83, and 2.82, respectively, which corresponds to the verbal interpretation of serious. These identified serious problems are similar to the findings of Escalona (2020) due to the limited number of officer/personnel assigned and trained to operate it. Similarly, the two identified problems during the implementation of e-policing are the intermittent internet connection and lack of trained personnel. It indicates that the Lipa City Police Station has encountered serious problems in the implementation of the e-rouges gallery as there are unclear pictures and inaccurate information, and it cannot be easily updated from time to time.

In terms of the problems encountered in the implementation of the e-warrant system, the survey findings revealed that items 1, 4, 3, and 2, *there are unclear and inaccurate information, it cannot be used by the arresting officer of a police officer, e-Warrant cannot be easily updated from time to time, and concerned officer/personnel assigned are not trained to operate it*, obtained weighted means of 3, 2.97, 2.94, and 2.91, respectively, which corresponds to the verbal interpretation of *serious*. Although Mamalian (2014) affirmed that the new technologies provide easy and accessible recording of incidents that cannot be forged and faster and better access to persons with active or pending warrants of arrests, the internal stakeholders still identified some serious problems with the implementation in Lipa City Batangas.

With regards to the problems encountered in the implementation of the e-blotter report, the survey findings revealed that items 2, 1, 4, 3, 6, and 5, *stocking record of the traditional blotter report is conducted, as usual, paper reports received from a day to day basis are still in practice, the printing of wanted persons is still the same, buying of commercial crime maps is still in practice, reported crime incidents are inaccessible to the community, and police officers can still tamper the police records*, obtained weighted means of 2.97, 2.86, 2.81, 4.5, 4.5, and 2.77, respectively, which corresponds to the verbal interpretation of serious. The findings contradict the attestation of Merueñas (2008) that the e-blotter system creates possibility of eliminating the “inaccuracy” of crime reporting. However, the serious problems encountered may not be terminal as the e-blotter system has only been introduced recently.

With regards to the problems encountered in the implementation of e-subpoena, the survey findings revealed that items 2, 5, 4, 3, and 1, *“the cost for paper and courier of subpoena is still a burden”, “the Judicial Courts cannot send the various subpoena to particular PNP units through an e-mail and the Chief of Police did not ensure that the documents are delivered and received by the concerned personnel on time”, “the records of a subpoena cannot easily within reach”, “there are delays on the arrival of subpoena”, and “subpoena cannot be forwarded from one station to*

another or from provincial police to the station police through email”, obtained weighted means of 2.86, 2.83, 2.82, 2.80, and 2.79, respectively, which corresponds to the verbal interpretation of *serious*.

In general, there are problems encountered in the implementation of Philippine National Police Electronic-Project Systems in Lipa City Batangas in terms of e-rouges gallery, e-warrant system, e-blotter report, and e-subpoena classified as “*serious*” problems encountered by the police investigators, crime registrars, and concerned police officers. Although these problems are considered serious, the users cannot implement corrective measures as the systems are commissioned projects.

**Table 3**

*Test of the significant relationship between the level of implementation and the problems encountered in the PNP e-Project Systems in Lipa City Batangas*

Variables	N	Statistical Tools	C-Value	P-Value	Decision	Decision
Implementation of e-Rouges Gallery VS Problems Encountered in e-Rouges Gallery	120	P	.086	.348	Accepted	Not Significant
Implementation of e-Warrant System VS Problems Encountered in e-Warrant System	120	r	.117	.201	Accepted	Not Significant
Implementation of e-Blotter Report VS Problems Encountered in e-Blotter Report	120	s	.331	.000	Rejected	Significant
Implementation of e-Subpoena VS Problems Encountered in e-Subpoena	120	n	.065	.481	Accepted	Not Significant

Table 3 revealed that the implementation of e-rouges gallery, e-warrant system, and e-subpoena has a p-value of .348, .201, and .481, respectively, which is greater than the 0.05 level of significance, thus, the null hypothesis is accepted since it is not significant. It indicates that the implementation of e-rouges gallery, e-warrant system, and e-subpoena have no significant relationship to the problems encountered in its implementation. However, the implementation of the e-blotter report has a p-value of .000 which is less than the 0.05 level of significance, thus, the null hypothesis is rejected since it is significant. It indicates that the implementation of the e-blotter report has a significant relationship to the problems encountered in its implementation.

## 5. Conclusion

This study finds that the e-projects systems of the Philippine National Police in Lipa City Police Station is implemented in terms of e-rouges gallery, e-warrant system, e-blotter report, and e-subpoena system. However, the Lipa City Police Station has encountered serious problems in the implementation of the e-project systems. Furthermore, the e-blotter report has a significant relationship to the problems encountered in the implementation of PNP e-project systems.

As the system is relatively new and its implementation is still within the trial stage, this study recommends the continuous conducting of capability training programs. The police officers, crime registrars, and other concerned police officers who have access to the PNP e-projects systems needs to be trained and retrained in using, managing, supervising, and troubleshooting the systems. Likewise, the PNP should enhance the e-rouges gallery, e-warrant system, e-blotter report, and e-subpoena system since serious problems are recorded upon its use. Relative to this, further studies are also encouraged on the deeper analysis of these serious problems as basis for the system improvements.

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