

# Business Process Reengineering in a Volatility, Uncertainty, Complexity, Ambiguity, and Disruptive (VUCAD) Landscape



Felicisima V. Rafael, Learando E. Rafael, Grace B. Villaruz, Venus P. Cuyugan

**Abstract:** *This paper presents a Business Process Reengineering in a Volatility, Uncertainty, Complexity, Ambiguity, and Disruptive (VUCAD) context in a telecommunication company in the Philippines. Telecommunication companies thrive to counter human resources related problems such as high attrition rates, expensive talent acquisition and management program in the telecom sector, access management and connectivity, and human resources productivity turn-over. In this age of Fourth Industrial Revolution (4IR) which heavily relies on the technology-driven operations, Business process re-engineering (BPR) has been seen to purport quantum leap and improvements in the organizational performance by looking and focusing the business process improvements in the technology roadmap design, analysis and design of process workflows, and business process within the confine of the organization. The researchers utilized a descriptive-evaluative research design using analytical tools SWOT and PEST. Based on the study, the telecom company should invest in integrating the emerging technologies in the operation, and that a Technology Roadmap was recommended. Further studies could be done using empirical analysis and other engineering techniques to solve recurring problems in telecommunication and other companies.*

**Keywords:** *ambiguity, business process reengineering, complexity, disruptive environment, VUCAD environment.*

## I. INTRODUCTION

The many faces of transformative industries have changed the industrial and business landscapes today. These transformative activities to align business and industrial ramifications have primarily allowed these organizations to face various challenging situations, and thereby recalibrate their capacity and capability management, asset and configuration management including its business management strategy by embarking toward Business Process Reengineering (BPR). The impact of globalization and

regionalization such as ASEAN Integration have even posed challenges to these industries and business to recreate their core processes, improve the quality of their produced output, and the economics of the organizations such as reduction of costs in the production by using the Business process reengineering in this era of Volatility, Uncertainty, Complexity, Ambiguity, and Diverse (VUCAD) environments [8].

Most companies implemented business process reengineering by looking at their present state, and carefully understand its business process, demystified and deployed BPR projects to solve recurring and severe problems [1, 2]. Business process reengineering was used as a new paradigm in order to enhance performance by measuring the BPR readiness, recalibrate and redesign the organizational setting, and utilizes information and communications technology by deploying applications and automation system to support the operational and strategic goals of the organization [3, 4]. Although Business Process Reengineering has been considered as "best of breed", and used extensively by many organizations, it has been opined that with numerous methodologies, BPR projects failed because it lacks a structured and integrated approach [5, 6].

In this age of Fourth Industrial Revolution (4IR) which heavily relies on the technology-driven operations, Business process re-engineering (BPR) has been seen to purport quantum leap and improvements in the organizational performance by looking and focusing the business process improvements in the technology roadmap design, analysis and design of process workflows, and business process within the confine of the organization [7, 8]. In this 4IR era, all organizations were put in technological turbulence, rapid changes, disruptive settings, hyper-competition, and high-influx and high-velocity market. These characteristics collectively describe the VUCA world where organizations were put in varying, difficult and challenging situations such as volatile, uncertain, complex, and ambiguous nature [9, 10], or commonly known as the science of complexity and complex adaptive systems [11].

In order to counter the demands of the Fourth Industrial Revolution in the VUCAD environments, many of these industries have instituted technology-driven innovations which pressed them to migrate from their legacy to automation systems [13]. These migrations initiatives have repercussions to the entire value chain, change management processes and even the form and nature of the organizations.

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The use of technology in this 4IR era with VUCAD landscape has even opened numerous varying difficult industrial and business situations, a complex web of factors and characteristics made these companies vulnerable to complex global supply chain operations and dilemma [14, 15].

In the leadership and management sense, VUCAD is characterized by the changing setting which surmounts managers and leaders' decisiveness and strength of character [17] to countervail difficulties by developing, executing and evaluating organizational actions. Volatility is a state or situation which is pre-departure to uncertainty. Volatility creates uncertain situations which are difficult to predict [16] or a rapid and significant change [17] with varying magnitudes [18]. Decision-makers or leaders should develop a compelling vision, and value system to imbibe excellent organizational culture. The unpredictability of the outcomes of the event is dependent on the inputs and web of factors affecting its quality, form and nature [19], hence, the state of uncertainty. Uncertainty, however, can be countered by the organization by careful understanding the abilities of the organization, capacities and capabilities, business process management and BRP. More importantly, uncertainty can be address by doing the internal and external environment scanning and understanding what the competitors are doing.

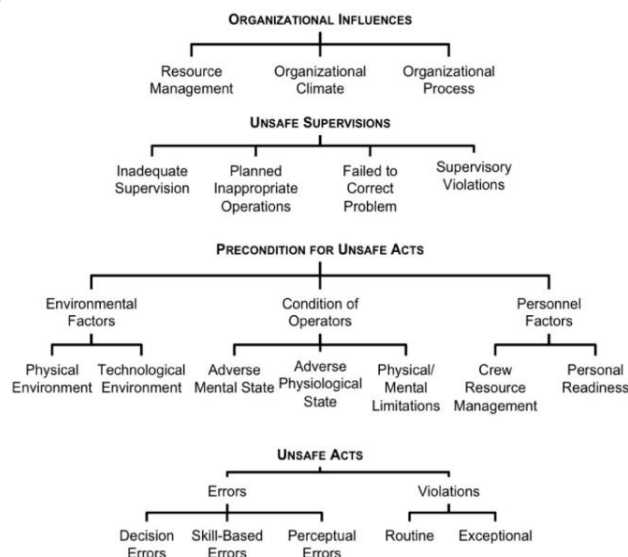
## II. BACKGROUND OF THE STUDY

A telecommunication company provides telecommunication services including data communication, access and telephony [48]. These services allow the service users to exploit the services, and become productive. Today, with the VUCAD and other difficult business situations, numerous challenges were faced by many telecommunication companies such as customer complaints, switching and customer attrition [49]. With the vibrant economy and good brand name, subscribers and users of telecommunication companies have become vast and huge, and they have realized it has become a problem in terms of data storage and management [50] for the huge volume of data, how they could maintain the interface and integrated services of the companies with their business processes [51], problems like delays and inconsistencies of data [53]. Telecommunication companies have deployed solutions to counter these problems, such as an expert system that are too expensive to develop and maintain [52], and that these solutions have created another problem ranging from legal and regulatory requirements, revenue, and politics and data security [54].

Human resources are valuable in the organizations; however, recently, organizational failure was linked with human resources. Telecommunication companies thrive to counter human resources related problems such as high attrition rates, expensive talent acquisition and management program in the telecom sector, customer dissatisfaction and switching [55, 56], access management and connectivity [57], human resources productivity turn-over [58], wastage of time and other resources to loss of effective and efficient employee [58, 59] and failure to imbibe the culture of a "happy worker is a productive worker" [60, 61].

Another state in VUCAD context is the complexity which is coined the science of multiplicity of issues and factors [21]

as presented in Fig 1 [26] as perceived by the organization with confusion and difficulties confronting the situation [22]. With the advent of 4IR, it has been seen that the complexities of the organization will be a challenge and exponentially continue due to hyper-era [23], but can be countered by developing clear and concise organizational goals [23]. Lack of clarity in any facets of the organization leads to ambiguity and contributes to creating the situation more difficult to understand and troubleshoot [24]; hence, the organization needs to be agile [25]. In most researches, organizational failure and performance variation are attributed to human and environmental factors and influences as describe in the figure 1.



**Fig 1. Human Factors Analysis and Classification System [26]**

This paper presents a Business Process Reengineering in a Volatility, Uncertainty, Complexity, Ambiguity, and Disruptive (VUCAD) context in a telecommunication company in the Philippines. It aims to identify the company strengths, internal weakness, opportunities and threats to the organization. The study also pegged to present the political, economic, social and technological environments, and develop or proposed an improvement plan to counter the issues and problems of the company.

## III. METHODOLOGY

In this study of Business Process Reengineering in a Volatility, Uncertainty, Complexity, Ambiguity, and Disruptive (VUCAD) Landscape, the researchers used a descriptive-evaluative research design. An analytical tool was used to categorize significant human and environmental factors affecting the business and industrial situations using (Strengths, Weaknesses, Opportunities, Threats) framework [27, 28] using a 6-point Likert Scale with -3 = Extremely Detrimental, -2 = Very Detrimental, -1 = Detrimental, 0 = No Effect, 1 = Beneficial, 2 = Very Beneficial, and 3 = Extremely Beneficial.

Also, the Political, Economic, Social, Technological (PEST) analysis was used to assess the organization's environments that are heavily attributed to the success of the business and guide in identifying the internal capabilities, and which business and technology improvement could be integrated into the operation to further the business or organizational strategic plan [29, 30, 31] using a template from Smart sheet.

These analytical tools were applied in the operational and strategic units of a multinational telecommunication company with 5 offices in the Philippines.

#### IV. RESULTS AND DISCUSSION

This section presents the results of the business process reengineering project deployed in the company given the setting of Volatility, Uncertainty, Complexity, Ambiguity, and Disruptive (VUCAD) Landscape. It also provides activities and collective contribution of the employees based on their business processes in the operational and strategic units.

##### A. Business Process Reengineering Readiness Assessment

The Business Process Reengineering Assessment Guide of Accounting and Information Management Division, United States General Accounting Office was used as describe if figure 2 to help the telecommunication company rethink, and dramatically improve their quality of work, improve customer service, reduced its operational costs [32]. Using this framework, the Core Processes in the operational and strategic units of the company were identified to improve the inefficient processes, and remove the unnecessary ones. The Business process reengineering will drive several changes in the aspects of policies and regulations since it will need policy-making activities [33,34], changes and restructuring in the people and organization, integration of information technology for the Demand Management, and the matured management and decision support structure. Further, the Business process reengineering initiative will embark Change Management to control standard, normal, emergency, minor and major changes due to BPR [35, 36].

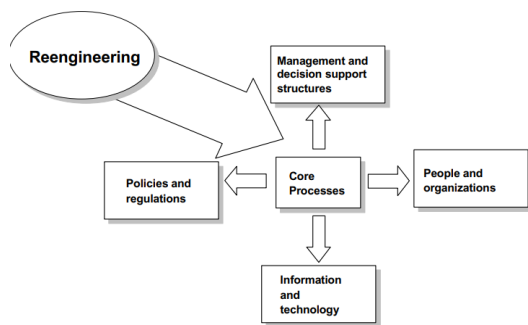


Fig 2. Business Process Reengineering Framework [32]

##### B. Business Process Reengineering using the SWOT Analysis

The goals of the BPR project includes; to improve employee productivity, integrate emerging technologies, reduce operational costs, enhanced brand name, and improve global competitiveness. Based on the SWOT Analysis, the Table I, presents the Internal Strengths, Internal Weaknesses, Opportunities, and External Threats. Accordingly, the

Internal Strengths include, the Cutting-edge technology, excellent design and support team, High-performing data center and production equipment, excellent customer service, and the company has strong and competitive sales team.

The company's Internal Weaknesses includes Corroded and some obsolete technologies, high Employee Attrition rate, Tier 3 data center, slow service, and lackluster sales team. It has foreseen External Opportunities, such as use of Emerging technologies, decreasing number of competitors, increasing number of users, offering other telecom services, and outsourcing other services. Also, external threats have been identified, such as stricter government policies and regulations, the new entrants and competitors, users' attrition rate, regulation on telecom services, and higher price rates of outsourcing services.

Table- I. The Company SWOT

Internal Strengths	Internal Weaknesses
Cutting-edge technology	Corroded and some obsolete
Excellent design and support team	Employee Attrition
High-performing data center and	Tier 3 data center
Excellent customer service	Slow service
With strong and competitive sales team	Lackluster sales team
Opportunities	External Threats
Emerging technologies	Stricter government policies and
Decreasing number of competitors	New entrants and competitors
Increasing number of users	Users attrition
Offering other telecom services	Regulation on telecom services
Outsourcing other services	Higher rates of outsourcing services

In this study, the goals relative importance is computed as illustrated in Table- II. The goals relative importance as listed as; to improve employee productivity (20%), integrate emerging technologies (20%), reduce operational costs (30%), enhanced brand name (10%), and to improve global competitiveness (20%); and the percent of time Spent on each goals are also presented in Table-II.

Table- II. The Goal Information

Goals	Relative Importance	Percent of Time Spent on Goal
Improve employee productivity	20%	40%
Integrate emerging technologies	20%	20%
Reduce operational costs	30%	20%
Enhanced brand name	10%	10%
Improve global competitiveness	20%	10%
<b>Analysis Total (Should equal 100%)</b>	<b>100%</b>	<b>100%</b>

Table- III illustrates the SWOT Final Analysis which includes the Raw Score, Significance Score, Relative Importance, Emphasis Quotient, Emphasis Percentage, Current Level of Effort, and Change in Effort. The Final Goals Analysis Raw Score shows that Improve employee productivity has (11), Integrate emerging technologies (21), Reduce operational costs (4), Enhanced brand name (9), Improve global competitiveness (10). Raw Score is the total of ranking factors given in the Strengths, Weakness, Opportunity and Threats Sections.

On the other hand, the Final Goal Analysis Relative Importance shows that the company needs to improve employee productivity (20%), Integrate emerging technologies (20%), Reduce operational costs (30%), Enhanced brand name (10%), and Improve global competitiveness (20%).



# Business Process Reengineering in a Volatility, Uncertainty, Complexity, Ambiguity, and Disruptive (VUCAD) Landscape

In this business process reengineering initiative, the Emphasis Quotient or the comparison of company's opinion of importance and significance or feasibility based on the SWOT factors given shows a values of Improve employee productivity (7.3), Integrate emerging technologies (14.0), Reduce operational costs (4.0), Enhanced brand name (3.0), and Improve global competitiveness (6.7).

**Table- III. The SWOT Final Analysis**

Final Analysis							
Goals	Raw Score	Significance Score	Relative Importance	Emphasis Quotient	Emphasis Percentage	Current Level of Effort	Change in Effort
Improve employee productivity	11	36.7	20%	7.3	21%	40%	-19%
Integrate emerging technologies	21	70.0	20%	14.0	40%	20%	20%
Reduce operational costs	4	13.3	30%	4.0	11%	20%	-9%
Enhanced brand name	9	30.0	10%	3.0	9%	10%	-1%
Improve global competitiveness	10	33.3	20%	6.7	19%	10%	9%
			100%			100%	0%

Based on the Final Analysis, the Current Level of Effort or the percentage of the company's time spent on each goal shows that on goal Improve employee productivity was (40%), Integrate emerging technologies (20%), Reduce operational costs (20%), Enhanced brand name (10%), and Improve global competitiveness (10%).

Also, based on the SWOT Final Analysis, the Change in Effort or how the company should change its time allocation to maximize success based on its goals, their importance and the SWOT factors that affect them shows that Improve employee productivity is (-19%), Integrate emerging technologies (20%), Reduce operational costs (-9%), Enhanced brand name (-1%), and Improve global competitiveness is (9%).

### C. Business Process Reengineering using PEST Analysis

Using the Smart sheet template of PEST analysis, the Table- IV was generated. On the Political note, it was identified that the company has pertinent permits to legally-operate in the Philippines, and compliant to regulatory requirements, Compliant with the changing needs of the business locally and international such as the GDPR and Data Privacy Act of 2012, and other telecommunication related legislations, Compliant with the local and international taxations, Adheres to the local and international laws related to business and corporation codes, and Adheres to the local and international labor laws.

Economically, the company has a good financial and economic gains, the company continually grow and expands its operation in the region, with good dynamics to the inflation and interest rates. It has a rapid increased in the production of wireless and wireline services. One of the top and competitive telecommunication services provider with good financial health. With good employment rate and low attrition rate.

On the Social Environment, the company has operations in North America, South America and in the Philippines, with employees that are fresh graduate, mid-career to executive professionals with undergraduate to post-graduate education, amongst the high-paying company in the Philippines and in North and South America. The company promoted Work Life Balance, and a company with respect for diversity, inclusive and multi-cultural.

The company has also developed innovations in wireless and wireline telecommunications services, embarked with the Fourth Industrial Revolutions demands such as

automation, block chain and Internet of Things [37, 38]. With patented technologies and licenses for software's and technologies used in the operation. It has also the cutting-edge technologies and excellence design and support teams. The company follows the international intellectual property laws such as in Copyright, Utility Models, Trademarks, etc.

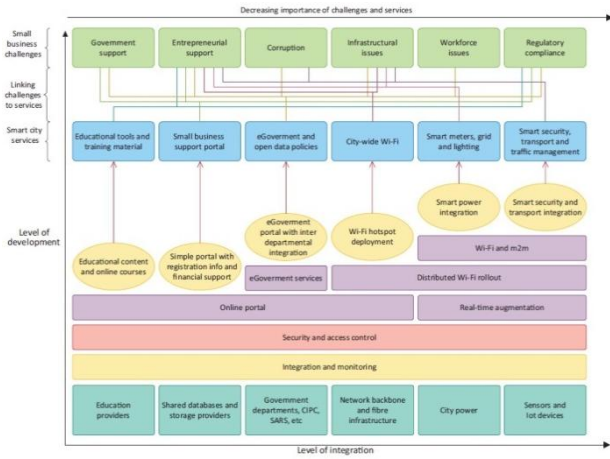
**Table – IV The Political, Economic, Social and Technological Analysis**

P		POLITICAL	
REGULATIONS & GOVERNMENT OVERSIGHT		With pertinent permits to legally-operate in the Philippines, and compliant to regulatory requirements	
LEGISLATIVE CHANGES		Compliant with the changing needs of the business locally and international such as the GDPR and Data Privacy Act of 2012, and other telecommunication related legislations	
TAXES		Compliant with the local and international taxations	
LEGAL ISSUES		Adheres to the local and international laws related to business and corporation codes.	
EMPLOYMENT ISSUES & WAGE		Adheres to the local and international labor laws	
S		SOCIAL	
DEMOGRAPHICS		The company has operations in North America, South America and in the Philippines	
EDUCATION		Employees are fresh graduate, mid-career to executive professionals with undergraduate to post-graduate education	
INCOME DISTRIBUTION		Amongst the high-paying company in the Philippines and in North and South America	
LIFESTYLE TRENDS		The company promoted Work Life Balance	
CULTURE		A company with respect for diversity, inclusive and multi-cultural	
E		ECONOMIC	
BUSINESS CYCLES		With its good financial and economic gains, the company continuously grow and expands its operation in the region	
INFLATION & INTEREST RATES		With good dynamics to the inflation and interest rates	
ECONOMIC GROWTH		It has a rapid increased in the production of wireless and wireline services	
STABILITY OF FINANCIAL MARKETS		One of the top and competitive telecommunication services provider with good financial health.	
EMPLOYMENT RATES		With good employment rate and low attrition rate	
T		TECHNOLOGICAL	
MANUFACTURING INNOVATIONS		Developed innovations in wireless and wireline telecommunications services	
RECENT TECHNOLOGICAL DEVELOPMENTS		Embarked with the Fourth Industrial Revolutions demands such as automation, blockchain and Internet of Things	
PATENTS / LICENSES		With patented technologies and licenses for softwares and technologies used in the operation	
COMMUNICATION & INFORMATION TECHNOLOGY		With cutting-edge technologies and excellence design and support teams	
INTELLECTUAL PROPERTY		The company follows the international intellectual property laws such as in Copyright, Utility Models, Trademarks, etc.	

### D. Business Process Reengineering using Technology Road mapping

Based on the results of the SWOT Analysis, the company needs to invest in time for integrating emerging technology into the operations, hence, the company should provide services to advocate the development of Smart City services and infrastructures requirements [39, 43], and thus a Technology Planning was required. One of the technology planning tools is Technology Roadmapping.

The Technology Roadmap of [39] was recommended and adopted as illustrated in Figure 3 to help the company redesign its technological info structure and infrastructure to deal with the competitive business environment [44]. This would also allow managers to value the importance of technology-driven innovations [45] to improve its enterprise capabilities [46] and eliminate wastes in the production using lean thinking [47]. With the technology shortcomings, as well those identified uncertainties the confronted business models, the use of integrated service science and management [43] and Internet of Things in telecommunication services [41] will help change the spectrum of the business landscape and respond to the demand and behavior of the users [42].



**Fig. 3. The Adopted Roadmap for Smart City Services [39]**

The technology roadmap will allow the telecommunication companies services users and subscribers to provide the needs and infrastructure requirements of the interrelated Smart City services [63] and other fields and core factors for a successful Smart City such as for energy, water, health services, security, environment, waste management, culture and leisure, entertainment, employment, education, social services, government, mobility, infrastructures, and data security services [64, 65, 66]. Telecommunication companies can also embark with deploying innovations in their wireless and wireline services to allow decision and policy-makers to develop a program to enhance the life quality of citizen [67, 68], instill and develop the smart mentality in the community [69].

**V. CONCLUSION AND RECOMMENDATION**

This paper aimed to identify the company strengths, internal weakness, opportunities and threats to the organization. The study also pegged to present the political, economic, social and technological environments, and develop or proposed an improvement plan to counter the issues and problems of the company. Based on the SWOT Final Analysis, the Change in Effort or how the company should change its time allocation to maximize success based on its goals, their importance and the SWOT factors that affect them shows that Improve employee productivity is (-19%), Integrate emerging technologies (20%), Reduce operational costs (-9%), Enhanced brand name (-1%), and Improve global competitiveness is (9%). Hence, the telecom company should invest in integrating the emerging technologies in the operation, and that a Technology Roadmap was recommended. Further studies could be done using empirical analysis and other engineering techniques to solve recurring problems in telecommunication and other companies.

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