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# A Literature Review on Business Continuity Based on ISO 22301, Six Sigma and Customer Satisfaction Evaluation

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**Abstract**— This study purpose is to examine the literature on Business Continuity as a comprehensive lifecycle in an organization. Process management is the peak of all activities that correspond to the flow to metaform of the ongoing business operations. Maintaining a current flowing system should consider several important aspects, one of those is business continuity management which features heavily in strategies that being generated from the organization's governance stance. There is an international standard regarding it in ISO 22301 which emphasize the significance of comprehensions of the organization's need, implementing the controls, monitoring and continual improvement based on objective requirements. To fulfill the activities into the optimal phase, business process management system is required whether to minimize the overall cost or to improve the quality based on Six Sigma, doing some basic comparison to obtain remarkable risk management framework, to propose a certain model that facilitates the entire aspects.

**Keywords**—; *Business Continuity Management, ISO 22301, Business Process Managements Systems, TQM, Six Sigma, Risk Management, Customer Satisfaction Evaluation*

## I. INTRODUCTION

BCM (Business Continuity Management) is the concurrent development of strategies, plan and actions that comes in sequence activities should provide maintenances or restoration as swift as possible regarding the core / critical business functions depending on the nature of business sector that provide either goods and services to the customers. It should able to identifies potential impacts that possess threat to the organizations and assisting by providing a holistic framework for the capability that response to the significance of its stakeholders, that able to facilitate a recovery plan for short term, middle term and long term operations.

Adjusting on the systematical procedure of the business is undertaken, there would be either an embedded or a clear separation between several aspect that underlying it such as risk

management, incident response, business continuity plan, capability dimension until the assessment of customer satisfaction through customer service relation section.

During the early phases of implementing business continuity into a spesific organization, there will be an initial requirement for a specialist professional function to manage the projects, co-ordinating the progress, executing some rehearsal or training and validating the programme. In a more established organization, in which these ability are embedded at functional level, the role of those specialist professional function will move to upper side of activities such as governance, policy and quality assurance.

Intial phase such as planning includes the preparation regarding the aspect that are impacted by potential disruptions. The development and implementation of a BCM process will focus in particular on the following areas [1] :

- Definition including scope of BCM
- Anchoring of BCM in the corporate organization
- Creation of a governance structure adapted to the corporate organization
- definition of BCM roles and responsibilities
- Definition of crisis scenarios and their impact on the company's resources (planning basis)
- Identification of business-critical resources and a Business Impact Analysis (BIA)
- Definition of the Business Continuity Strategy for the fundamental approach.
- Preparation of Business Continuity Plans designed to permit the recovery of business-critical processes and resources in a crisis situation

- Business Continuity Reviews and Business Continuity Tests for the Business Continuity Plans and crisis management organization
- Report, communication and training.

There are several fundamental background in BCM that serves as initializations, that are [2]:

- Zooming on daily the business operation  
Steps of establishing and visualize steps and procedures that make an enterprise to react to a scene that take place for untolerate time and back to activate its critical business process after a disruption.
- Focuses on getting the technical infrastructure  
The management of how to deal with specific types of disaster The technical (e.g., Repositories, architecture, storage, server, third parties). pieces of business continuity planning to regather data center..
- Focuses on stabilizing the disaster disruption  
The whole line of command of an organization's reaction due to a critical time in an swift, precise action with the purpose to optimalizing subordinate safety and advoid or transferring casualities to the organization's income, brand and operation.

## II. LITERATURE REVIEW

### A. Business Continuity

In ISO 22301, Business Continuity Management pointed out as an overall managerial process whose able to sensing upcoming events that able to threaten, thus predicting the possibilities consequences that going to take place if becoming true. providing a complete blueprint and framework for composing resilience with the power of relevant response that protects the importaant key stakeholders, reputation, brand and business process activities. it emphasizes the importance of [3]:

- Comprehensioning of the organization necessities to conclude policie and objectives.
- Executing controls and estimation for managing disruptive incidents.
- Observing the performances
- Conducting a sustainability efforts.

This global standard approach implement the "Plan-Do-Check-Act" model to create a complete blueprint, Deciding the policies, Executing the work plan, Maintain daily schedule, observing the whole process, discussing the daily results pof a period, sustained the better result and continually growing at steady pace[3].

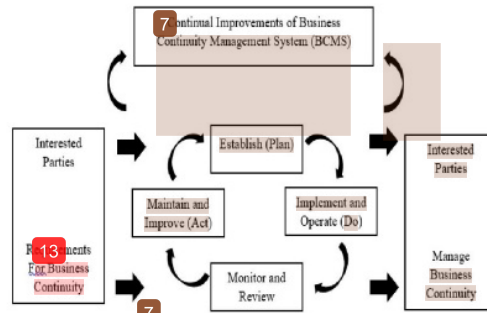


Fig 1. PDCA model applied to BCMS processes

The PDCA model start with the planning phase where the main activity is to establish business continuity policy, setting up targets, activities control and formalizing procedures. The next phase is to implement and operate the business continuity policies. After being implemented, there is checking phase where monitoring and reviewing overall performance against policies and objectives which producing the result and determines what suitable actions that should follow after, and the last phase is maintain and improve by taking suitable corrective actions based on the results of management review and reappraising the scope of policies and objectives.

### B. Six Sigma

One recent TQM methodologies that was developed by motorola in 1980s. The implementation of six sigma is not restricted to particular enetrprises. many other form of enterprise also triumphly adapted this work flow. The major aspect from six sigma is to utilize massive data analysis to analyze the components that disturb business process [4].

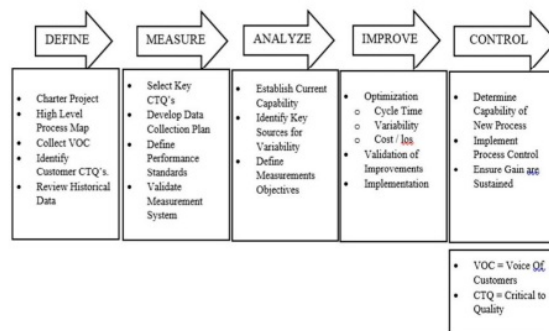


Fig 2. Six Sigma illustration [5]

The Six Sigma explanation in sequence are :

- Define
  - determine the stokeholder and their requisite
  - Identify main attributes of a customer
- Measure



- Deciding process characteristics and verification
- Obtain data and decide the basic performance
- Analyze
  - Process raw supply into information to support the process
- Improve
  - Creating procedure to accelerate process capability and comparing the results to the basic performance
- Control
  - Monitor the process to make sure there are no modification occur

As the supplementary to conduct an undergoing approach, Six sigma also stress out that organization possess certain specific number of a person that act as six sigma trainers. there are 3 (three) types of six sigma certification that are : green, black and master. Green belt practitioner are used with methodology and philosophy. they are usually the managers on the organization.

Not quite similar with black and master belt, green belt are usually not embroiled whole clocks with the execution. Black belt holders receive massive full hour training in statistics, main process, interpersonal skills and daily routine management skills. While on master belt, concludes even more hours of training better than other practitioners.

### C. Risk Management Framework

The Risk Governance framework introduce several points on the matter of risk : involvement of social issues and a new perspective of risk related cognition. [8]

*Involvement of the social issues.* Another aspect from the ingredients of risk counting, risk management and risk appetite, the framework contributes almost fairly necessity to handout practices, which are either straightly incorporated into a legal action consisting of the upper and supplementary matters or establish the primary states for producing convenient risk-related verdict. Visible facets of the early denominations come under the form and scene of the different stager dealing with risks, The method of how these node behave may distinctively carry out the risks and what matters of their possess regarding their response. Templates of the next denomination is about the regulation pattern accompany with the usual socio-political impacts inside the organizations having contributed in the process, organizational commands and the scope needed for applicable risk governance. connecting the reach with risk governance, the framework reflects the irreplaceable of risk-benefit marking and the requirements for solving several trade-offs [8].

*New Perspective of risk-related cognition.* The framework also suggest a new perspective of risk which is build upon the different kind of cognition regarding each matter of risk, differentiation among 'plain', 'intricate', 'uncertain' and

'ambiguous' risk problems. The characterization of unques risk rely on the level of adversity of determining the cause-effect link among a risk agent and its potential causes, the reliability of this link and the level of negative effect with consideration to both what a risk actually values for those inflicted and the values to be implemented when choosing decisions.[8]

### III. METHODOLOGY

On this chapter, there are 2 comparisons on Business Process Management and Risk Management.

#### A. Business Process Managements systems comparison

The purpose of the comparion is to single out several different perspectives on several methodologies that available such as Radical BPR (Business Process Reengineering), TQM and Six Sigma. Six sigma is a descendant of previous one and applied almost similar methods. BPR has gained much from a extereame intro from zero engagement to a minor oncoming. from a theoretical matter, overall practice had purpose to obtain a better management life cycle and sustained corporate performance from the efforts of kaizen [4].

The scope of radical BPR is to modify how the overall step in conducting the business process on the enterprise. this might be too risky, not mentioning to the possibility of potential risk that underlying and several resistance from the user itself, including the stakeholder. Comparing with TQM and Six Sigma, each business process managements systems is pointing out the specific point that should be undertaken. Six Sigma possess the suitable characteristics in undergoing the business continuity aspect, caused by focusing on certain process that need to be taken care of, not to alter the overall business process.

To implement as the sources on business process management systems based on several categories such as as level of change, scope, focus, participants, role of IT, other enablers, risk and principle goal. as explicitly describe on table I [4].

TABLE I COMPARISON OF BPR, TQM AND SIX SIGMA

	Radical BPR	TQM	Six Sigma
Level of Change	Radical	Incremental	Incremental
Scope	Organization	Process	Single Process
Focus	Start from scratch	Redesign current process	Improve current process
Participation	Top-down	Bottom-up	Bottom-up
Role of IT	Essential enabler	Key enabler	Key enabler
Other Enablers	Process owners	Statistical tool	Statistical tool
Risk	High	Moderate	Moderate
Principle Goals	Cost reduction	Quality Improvement	Quality improvement

The methodology of six sigma is very good at identifying any defects and preparing with the counter steps to optimize the analyzed process.

### B. Risk Management Model Comparison

The main focus of this comparison is to observe some indicator of differences on specialization field and management activity that become determining factor in choosing suitable risk management framework. Each specialized framework had special characterization. There are 3 (three) model that going to be consider, that are ERM COSO, RISK IT – ISACA and ISO 31000. [6].

TABLE II. RISK MANAGEMENT FRAMEWORK COMPARISON

Indicator	Specialization Field				References
	IT	Finances	General		
ERM-COSO	○	■	■		[12],[16],[17]
Risk IT- ISACA	■	○	○		[13]
ISO 31000	■	■	■		[8], [14], [15],[6]
Management Activity					
	Planning	Do	Check	Act	
ERM-COSO	■	■	■	■	[12] [16],[17]
Risk IT- ISACA	■	■	■	■	[13]
ISO 31000	■	■	■	■	[8], [14], [15],[6]
■ : Specifically addresses ○ : Generally addresses					

From the literature results, the suitable criteria related to an optimal risk management framework that would be implemented later on the proposed model is ISO 31000, that suits most of the specialization fields and the management activities.

### IV. THE PROPOSED BUSINESS CONTINUITY MODEL

The proposed model reflecting the integration portion initialize by the initialization of six sigma, being translated into the P-D-C-A (Plan - Do -Check -Act) section with ISO 22301, being framed with the suitable risk management framework and its capability dimension, then being assess with the customer satisfaction evaluation. Being depict in figure 3.



Fig 3. The Proposed Business Continuity Model

The proposed model is devised based on the facts that underlying the definition of Business Continuity that put the minimum requirement of predefined capabilities level from an organization, to carry on its business process in term of products and/or services following a disruptive incident. Several common mistakes in Business Continuity are : obsolete business planning, lacking in preserving vital objects for critical routine, lack in predicting risks. In order to justify the proposed model, a certain Business Continuity Strategy is followed to enhancing the customized documentation, base practices and work products, which are result from customer satisfaction evaluation.

### V. DISCUSSION

To obtain optimal a remarkable Business Continuity result, Customer satisfaction mensuration is the trigger of the most important issues concerning business continuity, which is justified by the customer orientation philosophy and the main principles of continuous improvement of modern enterprise[7]. In fact, measurement constitutes one of the five main function of management science allowing for the understanding, the analysis and the improvement[8]. The importance of customer satisfaction mensuration is also decided on the fact that the field of consumer behavioral analysis has positioned its interest in the after purchase customer behavior [9]. Generally, the main reason for measuring customer satisfaction are summarized in the following description [10].

- Customer satisfaction govern the ultimate information. On this aspect, an organization had abilities to estimates its capability against rivals and able to map design of its future plan.
- Customers would rather not to express their discomfortness from products or services.



- Customer satisfaction measurement is able to spot new opportunities.
- Continuous improvement demands constant and rigorous development of a particular process.
- Customer based measurements may assist organizations to grasp behaviors and detailed identification and also analyzing further deep.
- The implementation of a customer satisfaction measurement program may undercover various aspects between the customer and the management of the business organization.

The swap of orientations has been reintroduced by the development of Total Quality Management, which is a particular approach on qualities, based on the involvement of all of its parts and constructing a sustained success through customer satisfaction. Benefits to all of the organization parties and to society[11]. In achieving optimal result of business continuity, at Fig 4 is described one devised strategy approach.

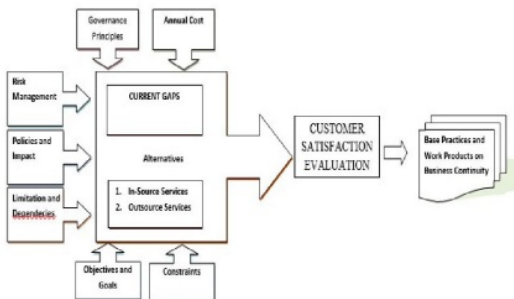


Fig 4. Business Continuity Strategy Approach

Consequently, customer satisfaction has the crucial role in the development process of a business continuity, given that it is based on the requirement, the expectation and the customer aspect. Emphasizing the customer perspective for the adding value of product and service, as a milestone from various input such as governance principles, cost, risk management, policies and impact, limitations and dependencies, objectives and goals and constraints to assess current gaps and also by considering in-services services and outsources services such as third parties. By gathering substansial aspects which are composed from various factors depict on Fig 4, the process would extract some base practices which are useful in sustaining business continuity. A sample of base product is depict on Fig 5.

Process ID	P1		
Stage	Planning (P)		
Process Name	Value Creation		
Objective	To achieve goals and sustainable Business Continuity		
Output (O)	Ref	Description	
	P1-O1	Achievements of Business Continuity's Goals	
	P1-O2	Increasing the Organization Governance and Reputation	
Base Practice (BPs)	Ref	Deskripsi	Supporting
	P1-BP1	Analyze and Identify Overall Business Continuity Plan	P1-O1
	P2-BP2	Organizational Performance Improvements	P1-O1, O2
	P2-BP3	Translating goals and Organization Managements into risk managements strategy process	P1-O1, O2
Work Products (WPs)			
Input			
Source	Description		Supporting
Eksternal	Governments Regulations and Law		P1-O1, O2
Eksternal	Global Economic Condition		P1-O1, O2
Eksternal	Technology Consideration		P1-O1, O2
Internal	Organizational Structure		P1-O1, O2
Internal	Business Process		P1-O1, O2
Internal	IT Infrastructure		P1-O1, O2
Output			
Ref	Description	Input For	Supporting
P1-WP1 - WP6	Business Continuity Document	P2, P3, P4, D1, D2, D3	P1-O1, O2

Fig 5. Sample Document Reference for Base Practice on Business Continuity

## VI. CONCLUSION AND FUTURE WORK

This paper is aimed to construct a literature review regarding business continuity integrating the possible conceptual proposed model between several aspect that underlying fundamental aspect and complementary that possess correspond aspects such as six sigma and risk management to undertake a holistic customer satisfaction evaluation as a remarkable input for business continuity.

Further work from this paper are conducting some study case regarding the capability process model with the aid of ISO 15504, and adopting some best practice from COBIT 5. the other works is to construct a quisioner regarding the customer satisfaction aspect, and the maturity level of the current Business Continuity Planning

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