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Original Article

Managing employee change resistance to Business Process Improvement (BPI) in the manufacturing sectors in Singapore

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Abstract

With ever changing global trends, consumer behavior, digital disruptions and global economic and political condition and other organizations have to constantly review their business processes and adopt to changes in order to sustain in the market, to be able to compete with the competitors. They must be able to change drivers, implementers and participants. In this study each category has provided their feedback based on their experience.

A quantitative analysis approach was used for this research study. Data was gathered from previous research studies and from the sample (N = 127) of different manufacturing organizations in this study. Data gathered from sample were tested through descriptive statistics and mentioned in the form of tables, figures and pie charts. Alpha reliability of the scale was 0.970. Based on the feedback from over 100+ participants and extensive literature study on resistance to business process change, a detailed analysis on impact of change resistance to business process, reasons for employee resistance were assessed and recommendations to reduce the employee resistance to business process change were provided.

Keywords: *Change Resistance, Business process change, Consumer behaviour.*

Introduction

The purpose of this study was to investigate the ways to manage employee change resistance behavior towards business process improvements in the manufacturing sector of Singapore. This dissertation was focused on Asia, particularly Singapore to study the relationship between the main sources of resistance to change and their impact on business process improvements.

Till today, manufacturing sector of Singapore, is a largest industry and plays a key role in the country's economic growth because of various reasons and for the diversified economic structure (Lee, 2016).

An organization growth and sustainable success are possible by intensifying their internal strength and the opportunities. Innovation and creativity are the key strengths and brings opportunity to any organization.

	2012	2013	2014	2015	2016	2017	2018
Total	42,414	41,775	42,648	52,150	60,739	48,294	45,609
Manufacturing	1,988	1,872	1,806	2,099	2,325	1,762	1,756
Construction	2,464	2,460	2,429	2,590	2,648	2,277	2,253
Wholesale Trade	8,941	8,560	8,468	9,861	10,768	8,011	7,909
Retail Trade	4,804	4,918	5,224	7,920	8,632	5,153	4,601
Transportation & Storage	1,770	1,848	1,786	2,345	5,522	7,101	6,087
Accommodation	60	83	78	48	83	66	69
Food & Beverage Service Activities	2,472	2,360	2,300	2,514	2,774	2,117	2,159
Information & Communications	2,722	2,621	3,000	3,858	4,642	3,530	3,452
Financial & Insurance Activities	2,679	2,691	2,836	3,038	3,315	3,040	3,139
Real Estate Activities	805	712	791	765	764	652	651
Professional, Scientific & Technical Activities	5,836	5,777	6,072	7,672	8,827	6,849	6,470
Administrative & Support Service Activities	2,526	2,514	2,474	2,994	3,185	2,296	2,187
Education, Health & Social Services	1,951	2,097	2,177	2,614	3,100	2,346	2,078
Arts, Entertainment, Recreation & Other Service Activities	3,177	3,026	2,965	3,553	3,840	2,820	2,540
Others	219	236	242	279	314	274	258

Source : Accounting and Corporate Regulatory Authority (ACRA)

Figure 1: Yearbook of Statistics Singapore 2019

Objectives and Questions

Employee change resistance that impact the success of the business process improvements and the organization strategic goals were analysed. Thus, it is important to identify the ways to manage the change resistance. This has to start with identifying the cause and impact of resistance towards change, followed by the recommendations to mitigate the resistance.

How to mitigate the resistance from employees?

Thus, data analysis of these three objectives were structured based on three phases, which is as follows

Phase 1 – Factors which influences resistance behavior

Phase 2 – Identify the impacts caused by change resistance

Phase 3 – Identify the most influencing factors that cause change resistance and the impact.

Review of Literature

Business Process Improvements (BPI)

Business process is a set of activities executed by resources to produce an end product or a service in an organization. Processes were supposed to be improved continuously to avoid the redundant work, increase productivity, to avoid delays in the outcome and to ease the day to day

Source: https://asq.org/quality-resources/pdca-cycle.

operational activities (Kissflow Inc, 2019).

Figure 2: Plan-Do-Check-Act (PDCA) cycle

BPI aims in achieving efficient and effective way of executing projects and implementing actions, basically by avoiding repeated and unproductive outcomes through continuous improvement (Page, 2015). Business process improvement models (Jeston, 2018) helps to

maximize the organization opportunities, manufacturing productivity, and sustainability of the organization.

Success criteria of process improvement

To make the business process improvement initiative successful, business has to be aware of the critical factors that are to be set in place first. Golden rules for success of business process improvement lies with the following five critical factors (PrimeBPM 2020).

1. Business Process Improvement Methodology
2. Change Implementation Team and the Skills
3. Business Process Management Tools
4. Success Metrics of Business Process Improvement
5. Management level involvement

Moran& Moran, (2003), studies indicated the following four triggers and variables for a successful change (Figure 3) which are

1. Resource Commitment
2. Management Involvement
3. Degree of Change
4. Resistance to Change

Factor which should encourage and support the change is an organization and the work culture (Mead & Moran, 2003).

Figure 3: Success Criteria for Process Improvement (Source: Managing Change: the Human Factor in Process Improvement Initiatives *June (KUGUMAAG CIE GbBH)*

Employee Change Resistance

In every organization, at least there are one employee who are not ready for any change. A report from McKinsey shows that only 30% of the change projects were successful as the remaining 70% of the change projects were failed to achieve their goals, largely due to the employee resistance (Bregman, 2009;).

Following are the Hypothesis (Table 1) tested in this study:

Table 1: Proposed Hypothesis Testing of the Study

Hypothesis 1:	Leadership Involvement has a positive effect on employee change resistance behavior
Hypothesis 2:	Communication has a positive effect on employee change resistance behavior
Hypothesis 3:	Performance Metrics, KPI's has a positive effect on employee change resistance behavior
Hypothesis 4:	Fear of employee in stepping out comfort zone has a positive effect on employee change resistance behavior
Hypothesis 5:	Motivation has a positive effect on employee change resistance behavior
Hypothesis 6:	Training has a positive effect on employee change resistance behavior
Hypothesis 7:	Change assessment has a positive effect on employee change resistance behavior
Hypothesis 8:	Capacity Planning has a positive effect on employee change resistance behavior
Hypothesis 9:	Availability of Infrastructure has a positive effect on employee change resistance behavior
Hypothesis 10:	Project Timeline has a positive effect on employee change resistance behavior
Hypothesis 11:	Risk Management has a positive effect on employee change resistance behavior
Hypothesis 12:	Stakeholder Management has a positive effect on employee change resistance behavior
Hypothesis 13:	Openness has a positive effect on employee change resistance behavior
Hypothesis 14:	Change Management practice has a positive effect on employee change resistance behavior
Hypothesis 15:	Adoption Strategy has a positive effect on employee change resistance behavior

Research Approach

Survey questionnaire were set based on the hypothesis derived from literature review. Survey were conducted anonymously among individuals who were part of changes and also, encountered or resisted changes with the implementation of business process improvement.

Hypothesis

Research method and hypothesis was built based on the combination of the secondary data from the literature, existing journals, previous studies and surveys to identify the change resistance factors and the impact of resistance to the organization and the individuals. Derived hypothesis were set as the questions and data were collected to analyse the relation between dependent variable and independent variables. In this research, dependent variable is the success rate of business process implementation and the individual cause of the resistance is termed as independent variables.

Methodology

In this study, the sampling participants were selected using focused group method. Specifically participants were selected based on job role, position, experience and the company. The respondents of this research were grouped into three categories such as Change Drivers, Participants and the Implementers. Thus, the survey was conducted using non-probability sampling method, purposive or selective sampling (Foley, 2018) technique.

The last section of survey question was divided into three sub-sections namely

1. General
2. Cause of the change resistance
3. Impact of the resistance

All the respondents were able to read and write English and so the questions were set in standard UK English language.

Table 2: Survey Responses are less evenly Distributed

Role Played in Business	No. of Respondents
Change Driver-Manager /Leaders	34
Implementer	41
Participant	46
Total responses	121

Economic impact of contagious virus:

Existing research papers focuses on ailment-related medical costs or effect arising on economy caused by morbidity and mortality rate due to disease. Wang*et al.* (2013) conducts a study to investigate the effect of infectious disease on the performance of stocks in Taiwan's Bio-technology stocks. Major Taiwan's statutory infectious diseases included "ENTEROVIRUS-71, DENGUE FEVER, SARS and H1N1" and proposed that company shares in Taiwan's bio-technological industry have significant abnormal returns due to contagious virus. On the other hand, a study conducted by Siu and Wong in 2003, addressed the spread of Hong-Kong SARS epidemic of 2002, proposed that the number of serious negative effects were observed on the consumer side, with the short term severely influenced by local consumption and the export of tourism related services and services related to air travel. However, the economy did not face any supply shock as the manufacturing based in the Pearl River Delta remains unaffected and the supplies continued to be exported through Hong-Kong normally. Ichev & Marinc (2014) researched whether the geographical proximity of information circulated by the eruption of Ebola, accompanied by widespread media coverage, has affected asset price of USA. The outcome of the study indicates that the impact on the prices of stock is generally negative, however local media reporting also had a notable effect on local trading, and the effect is more pronounced in smaller and more volatile stocks and less stable industries.

Impacts on performances of Stock Market:

Seeing the effect on the stock markets, Nippani & Washer (2004), observed the effect

of SARS in Canada, Singapore, particular region of Hong-Kong, China, Indonesia, Philippines, Thailand and Vietnam and derived the conclusion that SARS affected only the stock markets of Vietnam and China. Chen, Jang & Kim (2007) checked the impact of SARS outbreak on the efficiency of the Taiwanese Hotel stocks. Using an event study approach, they found that during the SARS outbreak period, seven publicly traded hotel companies experienced steep declines in income and stock prices. The stocks of Taiwanese Hotel showed significant negative cumulative mean abnormal returns, indicating the significant impact of SARS outbreak on the performance in hotel stock. Wang, Yang & Chen (2013) conducted the study to investigate, how infectious disease can affect the performance of biotechnology stocks. The empirical results indicate that there is significant abnormal return on company shares in Taiwan's biotechnology industry due to infectious epidemics. Karlsson, Nilsson & Pichler (2014) studied about the impact of the 1918 Spanish flu epidemic on economic performance in Sweden. They found strong evidence for the pandemic, which is having a positive impact on poorhouse rates in the medium term, and also strong evidence of an immediate and lasting negative effect on capital returns. However, there is no evidence whatsoever that earnings were affected by the pandemic. Macciocchi *et al.,* (2016) studied the short-term economic impact of Zika virus outbreak on Argentina, Brazil and Mexico, and their result showed that, with the exception and the result shows that the market indices of the three Latin American and Caribbean countries with the exception of Brazil, which did not show large negative returns the day after each shock. The study also shows that the average return was -0.90% but on different occasions and in different countries it ranges from 0.90 percent to -4.87 percent. Bai (2014) studied the cross-border sentiments to investigate different aspects of investor sentiment impact by differentiating the scope of influence of the sentiments. He found that the sentiment especially developed and emerged anEU stock market regional sentimentthat had significant impact on sample market excess returns and volatility.

Relationship between Stock Market and Disease:

Stock prices change every day by market forces. By this, we mean that share prices change because of supply and demand, if more people want to buy it than sell it the prices then the price moves up and vice-versa. The demand and supply in this market entirely depends on the investors will. At the time of crisis or epidemic as the investor start turning pessimist about the share price the more likely there will be a fall in the share price. Chen, Jang & Kim (2007) checked the impact of SARS outbreak on the efficiency of the Taiwanese Hotel stocks and they had found the significant impact of SARS outbreak on the performance in hotel stock. Fiuzat *et al.,* (2010) sought to examine the relation between US economic decrease in 2008 and cardio vascular events as measured by local acute myocardial infractions, the result show that the adjusted and unadjusted analyses of the patients in Duke Databank for cardiovascular disease indicates a significant co-relation between the period, when stock market decreases and increment in acute myocardial infraction cases. Al-Awadhi *et al.,* (2020) recently conducted a study to investigate whether contagious infectious diseases affect stock market outcomes. The findings indicate that both the daily growth in total confirmed cases and in total cases of death caused by COVID-19 have significant negative effect on the stock market returns. Another recent study conducted by Baker *et al.,* (2020) on the unprecedented stock market reaction to COVID-19 pandemic using text-based method concludes that the news related to COVID-19 developments is overwhelmingly the dominant driver of large daily US stock market moves since February 24, 2020.

Time Series Analysis:

Time series is a sequence of observations recorded at regular time interval. Time Series Analyses has a great significance in understanding various aspects about the inherent nature of series so that, one could be better informed to predict meaningful and accurate forecast. Any time series may split into following components Base level + trend + Seasonality + Error. A trend is observed when

there is an increasing or decreasing slope observed in the Time Series. On the other hand, seasonality is observed when there is a distinct repeated pattern observed between regular intervals due to seasonal factors.

Stationary and Non-Stationary Time Series:

Stationarity is a property of a time series. Stationary series is the series, where the value of the series is not a function of time. It means that the statistical property of the series like variance, mean and autocorrelation are constant over time. Whereas, the Non-Stationary series, where statistical property of the series like variance, mean and autocorrelation are not constant over time.

Autocorrelation is the correlation between the series with its previous value. A Non-stationary series has to be made stationary before forecasting because forecasting a stationary series is relatively easy and the forecasting is more reliable. The most common method of making a series stationary is by differencing the series. Differencing the series is nothing but subtracting the next value by the current value in the series i.e., Y = Y (t) – Y (t-1).

Research Methodology

Data:

This study uses secondary data for the time-series from 30/01/2020 to 24/04/2020. Information was collected through two online sources - National Stock Exchange and World Health Organizations' official site.

Research Design:

Since the explanatory variables can be helpful in predicting dependent variable. The variable is statistically tested and the probability sampling is done in order to explain the cause and effect of the variables through structured and pre-planned design. Therefore, descriptive design is the best suited to show the cause and effect.

Statistical tool and Technique:

In order to achieve the objective, the series is to be made stationary because forecasting a stationary series is relatively easy and the forecast are more reliable. Therefore, in order to make the series stationary Augmented Dickey Fuller test (ADF test) is performed. Apart from ADF test, Ordinary Least Square method is used to predict values of a continuous response variable using one or more explanatory variable(s). It also identifies the strength of the relationship between variables.

Results & Discussion

Once the responses reached above minimum requirement of 100 responses and the target planned date, online survey form was closed for the responses. Collected responses were extracted, collated and prepared for further analysis. Data was analyzed using the software 'Statistical Package for the Social Sciences' (SPSS)

In this research, success rate of business process improvement is set as a dependent variable and the factors that were influencing change resistance and its impact were set as independent variables. To test the hypothesis, relation between the dependent variable and the independent variables were measured using Phi, Cramer's V and Somers' Delta testing.

Table 3: Frequency Analysis by Respondents' Role

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Implementer	41	33.9	33.9	33.9
Participant	36	38.0	38.0	71.9
Change Driver- Managers/Leaders	34	28.1	28.1	100.0
Total	121	100.0	100.0	

Table 4: Frequency of BPI Success Rate

	Frequency	Percent	Valid Percent	Cumulative Percent
ValidHighly Successful (71% -100%)	36	29.8	29.8	29.8
Accepted (41%-70%)	37	30.6	30.6	60.3
Partially Accepted (20% 40%)	26	21.5	21.5	81.8
Not at all Accepted (0 10%)	22	18.2	18.2	100.0
Total	121	100.0	100.0	

Employee's Resisted Change

Table 5: Frequency of Employee Change Resistance

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	110	90.9	90.9	90.9
No	11	9.1	9.1	100.0
Total	121	100.0	100.0	

Cronbach's Alpha -Reliability Test

Cronbach's Alpha calculations

To ensure the sample size data consistency, reliability test which is also known as Cronbach's alpha was calculated for all the variables that were interpreted using Likert Scale method.

Change Resistance Factors:

Data interpretation shows that Cronbach's Alpha value for all 15 factors which influence change resistance was 0.970.

Table 6: Relation of Communication, Leadership and Motivation with BPI Success Rate

	BPI Success Rate			
		Chi-Square Tests	Value	Approximate Significance
Communication	Nominal by Nominal	Phi	1.065	0.000
		Cramer's V	0.615	0.000
		Contingency Coefficient	0.729	0.000
	Ordinal by Ordinal Somer's D	Communication	0.590	0.000
		BPI Success Rate	0.596	0.000
Leading Change	Nominal by Nominal	Phi	0.813	0.000
		Cramer's V	0.469	0.000
		Contingency Coefficient	0.631	0.000
	Ordinal by Ordinal Somer's D	Leading Change	0.504	0.000
		BPI Success Rate	0.486	0.000
Motivation	Nominal by Nominal	Phi	1.023	0.000
		Cramer's V	0.591	0.000
		Contingency Coefficient	0.715	0.000
	Ordinal by Ordinal Somer's D	Motivation	0.574	0.000
		BPI Success Rate	0.543	0.000
				0.000

Summary of Hypothesis Testing

Table 7: Cramer V and Somer's Delta value for Hypothesis

Hypothesis Test Result		Cramer's V	Somer's Delta
Hypothesis 1:	Leadership Involvement has a positive effect on employee change resistance behavior	0.469	0.504
Hypothesis 2:	Communication has a positive effect on employee change resistance behavior	0.615	0.590
Hypothesis 3:	Performance Metrics, KPI's has a positive effect on employee change resistance behavior	0.563	0.434
Hypothesis 4:	Fear of employee in stepping out comfort zone has a positive effect on employee change resistance behavior	0.452	0.458
Hypothesis 5:	Motivation has a positive effect on employee change resistance behavior	0.591	0.574
Hypothesis 6:	Training has a positive effect on employee change resistance behavior	0.417	0.445
Hypothesis 7:	Change assessment has a positive effect on employee change resistance behavior	0.554	0.535
Hypothesis 8:	Capacity Planning has a positive effect on employee change resistance behavior	0.464	0.460
Hypothesis 9:	Availability of Infrastructure has a positive effect on employee change resistance behavior	0.575	0.610
Hypothesis 10:	Project Timeline has a positive effect on employee change resistance behavior	0.495	0.581
Hypothesis 11:	Risk Management has a positive effect on employee change resistance behavior	0.448	0.507
Hypothesis 12:	Stakeholder Management has a positive effect on employee change resistance behavior	0.493	0.544
Hypothesis 13:	Openness has a positive effect on employee change resistance behavior	0.438	0.544
Hypothesis 14:	Change Management practice has a positive effect on employee change resistance behavior	0.460	0.500
Hypothesis 15:	Adoption Strategy has a positive effect on employee change resistance behavior	0.561	0.619

Change resistance depend on current organizational culture, taking into account key challenges and develop strategies to overcome these issues and learn how to adapt their leadership style, ensuring they are fit to leada cultural change programme. The factors that must be considered are change context, language anddialogue as a key cultural process and the change team process (McCalman & Potter, 2015).

In spite of changes in the environment and management accounting practices, studies designate that management accounting systems do not alter or change at a much slowerrate than expected. The stability of the management accounting systems used by companiesmay relate to resistance to changing these systems. Research findings show that changing management accounting systems, through the application of an cohesive management system, faces internal resistance in these organizations. Each factor varies in intensity but is permanently present in these companies, such as ontological insecurity, inertia, lack of knowledge, trust, acceptance of routines and decoupling. These factors are roused when the change procedure starts and, if they accumulate sufficient force, can hinder the change (Angonese & Lavarda, 2014).

The progression of applying a continuous business process improvement culture in manufacturing companies is one of the most operative approaches for enterprise technology projects. Company management must approve that a culture of continuous business process development and will be a key part of their business policy. So Business Process Improvement (BPI), does not really have a universally-accepted definition. This can be done by mapping out the business process, identifying inadequacies, redesigning the procedure and benchmarking to initial metrics.

Conclusion

This research was aimed at identifying the factors that influence change resistance, the impact of the resistance and potential solutions to reduce the resistance behavior. Quantitative method was used to meet the research objective. According to the finding of the present study:

Top 3 causes of change resistance:

Above, analysis shows the following three were the top most influencing factors that cause change resistance. All these three factors were categorized as an organizational as well as IT project factors.

Communication which likelihood value was the highest and chi-square shows it was positively related to the success rate of BPI.

Capacity planning which likelihood test shows second highest value and chi-square shows it was positively related to the success rate of BPI.

Performance Metrics, KPI's which likelihood shows third highest value and chi-square shows it was positively related to the success rate of BPI.

Top 3 impacts due to change resistance:

Above analysis also shows that the following three were the top most impact an organization or an individual encounters due to change resistance. These impacts were also categorized into human, organization and IT related factors.

1. First, Employee Morale is strongly impacted due to change resistance
2. Second, Employee Turnover rate become high due to change resistance
3. Third, Employee acceptance to change is negatively impacted due to change resistance.

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Conflict of Interests

The authors declare that they have no conflict of interest.

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