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External Shocks and Regime Shift of ASEAN Economies

Inpong Luanglath*

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Abstract

This paper studied the effects of external shocks on the ASEAN economies. In this non-parametric study, we analyzed three regimes: GDP growth, interest, and exchange rates. We examined 677 weeks of spot exchange rates of ten currencies, thirty years of inflation and GDP growth rates in the ASEAN and tested their volatility to show regime shift. We employed the Dirac delta function to detect impulse response to external shocks. For GDP growth in the ASEAN, Brunei, Indonesia and Singapore are least affected by external shocks. However, all ASEAN countries are vulnerable to exchange rate regime shift ($p < 0.0422$). Cambodia ($p = 0.0681$), Laos ($p = 0.1379$) and Vietnam ($p = 0.0599$) faced the risk of regime change in inflation compared to the group average of $p = 0.5154$. We recommend stakeholders to use China as an economic buffer because it shows a high level of stability in all three regimes that we examined. The large size of China's economy, high purchasing power, and stable currency of China may help ASEAN countries to reduce the effect of shocks from western markets.

Keywords: ASEAN, China, Dirac Delta Function, Economic Buffer, Exchange Rate, Exogenous Shock, External Shock, GDP, Impulse Response, Inflation

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ผลกระทบภายนอกและการเปลี่ยนแปลงระบอบการปกครองของเศรษฐกิจอาเซียน

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บทคัดย่อ

บทความนี้ศึกษาผลกระทบของผลกระทบภายนอกต่อเศรษฐกิจอาเซียน ในการศึกษาแบบไม่อิงพารามิเตอร์นี้ เราได้วิเคราะห์ระบอบการปกครอง 3 รูปแบบ ได้แก่ การเติบโตของ GDP ดอกเบี้ย และอัตราแลกเปลี่ยน เราตรวจสอบอัตราแลกเปลี่ยนทันที 677 สัปดาห์ของสิบสกุลเงิน อัตราเงินเฟ้อ 30 ปีและอัตราการเติบโตของ GDP ในอาเซียน และทดสอบความผันผวนเพื่อแสดงการเปลี่ยนแปลงระบอบการปกครอง เราใช้ฟังก์ชัน Dirac delta เพื่อตรวจจับการตอบสนองของแรงกระตุ้นต่อแรงกระแทกภายนอก สำหรับการเติบโตของ GDP ในอาเซียน บรูไน อินโดนีเซีย และสิงคโปร์ได้รับผลกระทบจากปัจจัยภายนอกน้อยที่สุด อย่างไรก็ตาม ทุกประเทศในอาเซียนมีความเสี่ยงต่อการเปลี่ยนแปลงของอัตราแลกเปลี่ยน ($p < 0.0422$) กัมพูชา ($p = 0.0681$) ลาว ($p = 0.1379$) และเวียดนาม ($p = 0.0599$) เผชิญกับความเสี่ยงจากการเปลี่ยนแปลงระบอบการปกครองในด้านเงินเฟ้อเมื่อเทียบกับค่าเฉลี่ยของกลุ่มที่ $p = 0.5154$ เราแนะนำให้ผู้มีส่วนได้ส่วนเสียใช้จีนเป็นกันชนทางเศรษฐกิจ เนื่องจากจีนมีความมั่นคงในระดับสูงในทั้งสามระบอบที่เราตรวจสอบ ขนาดเศรษฐกิจที่ใหญ่ของจีน กำลังซื้อสูง และค่าเงินที่มีเสถียรภาพของจีนอาจช่วยให้ประเทศในอาเซียนลดผลกระทบจากแรงสั่นสะเทือนจากตลาดตะวันตกได้

คำสำคัญ: อาเซียน จีน ฟังก์ชัน Dirac Delta กันชนเศรษฐกิจ อัตราแลกเปลี่ยน ผลกระทบจากภายนอก ผลกระทบจากภายนอก GDP การตอบสนองต่อแรงกระตุ้น เงินเฟ้อ

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Introduction

The purpose of this paper is to examine the economic effect of two external shocks received by the ASEAN economies. These shocks were COVID-19 pandemic and economic sanctions against Russia after the ware in Ukraine which led to the rise in food and fuel costs. The COVID-19 pandemic measures were imposed in 2020-2021 and the ASEAN economies experienced the effect of the restrictive market condition under pandemic control measures. The rising in food and fuel costs after economic sanction against Russia in the first quarter of 2022 presently exerting inflationary pressure on the global economy.

In this paper, we are using China as a proxy country to explore the role of China as a regional and global economic powerhouse that could serve as a buffer market for the ASEAN countries. China's economy boasts a mammoth size of 17.46 trillion US dollars and a population of 1.402 billion people with per capita income of 12,359 US dollars. As such China is a market that could help absorb the effect of external shock against ASEAN. The Western market, for instance, US and EU area, are vulnerable and sensitive to negative shocks. China, on the other hand, exhibits steady growth path despite the ups and downs of the global economy. China's large population and significant purchasing power of its people represent an undeniable alternative market to the West. China and the ASEAN are in the same geographical location; this makes the larger market in China the more attractive and should not be overlooked as a trading partner. In this paper, we urge stakeholders in the ASEAN to rethink trade strategy and policy aiming for closer ties with China as a potential buffer against the effects of exogenous shocks.

There is a practical logic why the ASEAN Economic Community (AEC) should consider China as an important trading partner. Although there ASEAN countries are trading with China now, these trading activities are bilateral trade activities. ASEAN claims to have established an economic community (AEC), but to date the AEC had yet made significant impact on ASEAN's trading in the regional or global market place. There is a significant level of trade between ASEAN and China. According to Chinese official acknowledgement, it was reported that:

"In 2021, the trade volume of goods between China and ASEAN was US$878.2 billion, reaching a year-on-year increase of 28.1%. Among them, China's exports to ASEAN were US$483.69 billion, reaching a year-on-year increase of 26.1%; imports from ASEAN were US$394.51 billion, reaching a year-on-year increase of 30.8%. ASEAN has become China's largest trading partner for the second consecutive year. Vietnam, Malaysia and Thailand are China's top three trading partners in ASEAN."--- Brief Status of China-ASEAN Economic and Trade Cooperation in 2021.

Economic relationship between China and the ASEAN is two-ways. In 2021, ASEAN's invested US$10.58 billion in China. The top three ASEAN countries investing in China were Singapore, Thailand and Malaysia. However, these economic activities still needs further development and promotion. The potential for ASEAN-China trade is greater when what had been achieved so far. In face of the current risk in the global economy, the ASEAN as a single unit as embodied in the AEC should realign itself with China as trading partners. The most recent lessons of risk exposure from COVID-19 pandemic in 2020-2021 and the fall out of economic sanction against Russia in 2022 made clear that ASEAN is exposed to real risk of external shock as evidence by the swing of its GDP growth rate in Figure 1 below.

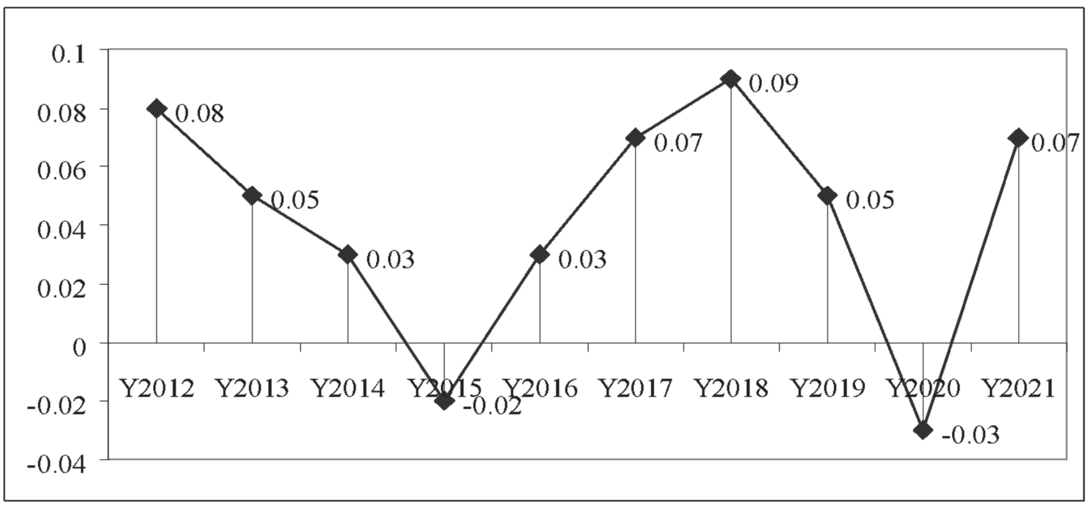

Figure 1: Year-to-year Change ASEAN's Economic Growth Rates Resulted from External Shocks 2012-2021

Source: IMF Annual Report. World Economic Outlook, 2021. The above figures are determined by: (growth Y2 – growth Y1) / growth Y1. Table 1, infra.

In Figure 1, we note two sharp drops in GDP growth in the ASEAN economy; there was one sharp drop in 2015 and another drop in 2020; both resulted from external shocks. In 2014, Russia annexed the Crimea from Ukraine. This action was followed by the imposition of economic sanctions against Russia. As the result, the Ruble was devalued and there was a loss of confidence in the Russia economy. The second cause of the 2014-2015 crisis was the drop in crude oil price by 50%. Crude oil was Russia's main export. A reduction in oil prices also led to the loss in the Russian economy (Viktorov and Abramov, 2020). A second drop in the GDP growth in ASEAN came in 2020; this drop was due to the COVID-19 pandemic. The lesson learned from these two recent crises raise the question of what can ASEAN do in order to reduce risk of external shock? We attempt to answer this question by asserting that ASEAN needs an economic buffer against the instability of western market. We urge ASEAN stakeholders to seriously consider China as an economic buffer by increasing two-ways trading between ASEAN and China. This is not an advocacy of China hegemony in Southeast Asia. This is a practical economic policy orientation for effective risk management to lessen the effect of exogenous shock.

The study of the effect exogenous shock on the ASEAN economy is an interesting research topic because ASEAN has a combined population of 665.17 million people and an economy worth 3 trillion US dollars. The economic health of the ASEAN region contributes to the health of the global economy and conversely poor economic performance of the ASEAN could also send a shock wave to its trading partners, especially major economies, such as China, Japan, US and EU area. This paper intends to raise awareness about the important role play by ASEAN in the global economy. Our study of the effect exogenous shock on the ASEAN economy turns to vector autoregressive (VAR) modeling.

The purpose of this paper is to examine the effect of COVID-19 pandemics upon economic growth on ASEAN countries. The Association of Southeast Asian Countries (ASEAN) is composed of ten countries: Brunei, Burma (Myanmar) Cambodia, Timor-L'este, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, and Vietnam. ASEAN has a common market call ASEAN Economic Community (AEC). The AEC market is valued at $7,188.00 million in 2020, and is projected to reach $15,842.00 million by 2028. Among major markets, such as Japan, US, EU, India and China, the AEC ranks third largest market size in terms of population (638.624 million). It has been touted as an emerging and fast growing market in Southeast Asia. However, the coming of COVID-19 pandemics has dampened economic growth in the AEC. This paper examines the effect of COVID-19 pandemic as an economic shock upon the AEC.

The UN Secretary General reported that COVID-19 created "unparalleled economic shock" and that "unemployment has skyrocketed. Temporary business closures are becoming permanent. Rebuilding to pre-crisis levels of employment and output may take years" (COVID-19: 'Unparalleled economic shock', 2021). The AEC shares the effect of this economic shock from COVID-19. Table 1 below shows the dip in GDP growth trends in the pandemic period (2020-2022).

Table 1: GDP Year-to-year Percentage Change in the AEC 2012-2021

Country	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Brunei	0.03	(0.05)	(0.05)	(0.24)	(0.12)	0.06	0.12	(0.01)	(0.11)	0.31
Cambodia	0.10	0.08	0.10	0.08	0.11	0.11	0.11	0.10	(0.07)	0.04
Indonesia	0.03	(0.00)	(0.03)	(0.03)	0.08	0.09	0.03	0.07	(0.05)	0.09
Laos	0.14	0.17	0.11	0.08	0.11	0.07	0.06	0.04	0.00	0.03
Malaysia	0.06	0.03	0.05	(0.12)	(0.00)	0.06	0.12	0.02	(0.08)	0.10
Myanmar	0.09	0.03	0.04	(0.01)	(0.04)	0.02	0.09	0.03	0.18	(0.18)
Philippines	0.12	0.08	0.05	0.03	0.04	0.03	0.06	0.09	(0.04)	0.07
Singapore	0.06	0.04	0.02	(0.02)	0.03	0.08	0.10	(0.00)	(0.09)	0.11
Thailand	0.07	0.06	(0.03)	(0.02)	0.03	0.10	0.11	0.07	(0.08)	0.09
Vietnam	0.14	0.09	0.09	0.02	0.06	0.10	0.09	0.08	0.05	0.07
MEAN	**0.08**	**0.05**	**0.03**	**(0.02)**	**0.03**	**0.07**	**0.09**	**0.05**	**(0.03)**	**0.07**
SD	**0.04**	**0.06**	**0.06**	**0.10**	**0.07**	**0.03**	**0.03**	**0.04**	**0.09**	**0.12**

Source: World Economic Forum Report 2022
https://www.imf.org/en/Publications/WEO/weo-database/2022/April/download-entire-database

The mean growth rate for the AEC took a dip in 2020 with a negative growth of -0.03%. There had been similar economic shock from the recent financial crisis in 2015 corresponding to the Chinese stock market crash. These two events are comparable in terns if their effect on the GDP growth rate in the AEC. The year 2015 was also the mark of the AEC integration. The initial -0.02% dip in 2015 may have been attributed to the intra-regional shock from the integration. The question we ask is whether COVID-19 presents a significant shock for the AEC as a regional market and for the individual country in the AEC? These research questions are interesting because it helps answer the question of ‘how resilient is the AEC economy in face of exogenous shock’?

The last shock experience by the AEC was in 2015, the year of its economic integration as an economic community. It took the region 3 years to regain its losses in 2015. The second shock came as the result of COVID-19; if the growth repeats the same pattern, we should expect the AEC to regain its prior growth trend by 2023. However, unlike the shock in 2015, coincided with the Chinese stock market crash and the AEC integration, the COVID-19 shock is a sustained exogenous event. Conventionally, economic shock is short burst of external disturbance that the market may absorb and rebound to its so-called long-term equilibrium. However, with sustained presence of external disturbance as COVID-19, the effect may lead to regime change altogether. A further research issue presented in this paper is to speculate whether the economic effect of COVID-19 should be classified as an economic shock of regime change?

Significant breaks in the behavior of economic time series, associated with events such as financial crises (Jeanne and Masson, 2000; Cerra, 2005); or abrupt changes in government policy (Hamilton, 1988; Sims and Zha, 2004, Davig, 2004) is called regime switching. Traditionally, economists look at erupt changes that led to changes in asset prices as indicator for regime switching (Ang and Bekaert, 2003; Garcia, Luger, and Renault, 2003; Dai, Singleton, and Wei, 2003). However, little work has been done on whether non-economic factor, such as a disease outbreak (COVID-19) and warfare (Ukraine war 2022) could lead to regime switching. This paper intends to tackle this research question and fill the gap in the literature.

Literature Review

Economic shock is defined as unexpected exogenous event that affects the economy. The study of the effect of external shock is generally accomplished by impulse response function (IRF). If the response is reactive, it is considered endogenous to macroeconomic variables; these variables include output, consumption, investment, and employment (Hamilton, 1994). These endogenous responses from exogenous shock occur after experiencing the shock. The shock could be positive or negative; thus, impulse response may be categorized into types of responses that are targeting the positive or negative shock (Hatemi-J, 2014).

The quantitative model used in IRF is vector autoregression (VAR). VAR is a stochastic model used to generalize a single-variable autoregressive model by allowing for multivariate time series. For example, in this study, we look at economic growth over time as a response to the COVID-19 or Russian-Ukraine military conflict. Generally, VAR model is theory bound by macroeconomic theoretical framework; however, there has been suggestion that VAR could be theory-free and could be used for purely statistical testing of a proposed hypothesis (Sims, 1980). We present the structural VAR below:

$$B_0 y_t = C_0 + B_1 y_{t-1} + B_2 y_{t-2} + \ldots + B_p y_{t-p} + \varepsilon_t \quad (1)$$

where c_0 is a $k \times 1$ vector of constants, B_i is $a\ k \times k$ matrix for $i = 0, \ldots, p$ and e_t is a $k \times 1$ vector of error terms. The main diagonal terms of the B_0 matrix with the coefficients on the i^{th} variable in the i^{th} equation) are scaled to 1. The condition for the error matrix follows: (i) $E(e_t) = 0$ every error term has mean zero; (i) $E(e_{t,} e'_t) = \Omega$, covariance matrix of the error term is $k\ x\ k$ denoted as Ω; and (iii) $E(e_t, e^t_t\text{-}k) = 0$, for non-zero k there should be no serial correlation for the error term. In a reduced form, (1) is rewritten in terms of the inverse of B_0 :

$$y_t = \frac{1}{B_0} C_0 + \frac{1}{B_0} B_1 y_{t-1} + \frac{1}{B_0} B_2 y_{t-1} + \ldots + \frac{1}{B_0} B_p y_{t-p} + \frac{1}{B_0} \varepsilon_t \quad (2)$$

where $\frac{1}{B_0} C_0 = c$, $\frac{1}{B_0} B_i = A_i, i = 1, \ldots, p$, and $\frac{1}{B_0} \varepsilon_t = e_t$. The pth order of the reduced form of VAR may be obtained, thus:

$$y_t = C + A_1 y_{t-1} + A_2 y_{t-2} + \ldots + A_p y_{t-p} + e_t \quad (3)$$

As the data used in this paper is time dependent, the VAR model is subjected to unit root testing. The unit root test is accomplished by the Dickey-Fuller test (Dickey and Fuller, 1979).

The Dickey-Fuller test for unit root considers the stochastic process: $Y_i = \varphi Y_{i-1} + \varepsilon_i$ where |ϕ| = 1 and ε_i is white noise. If |ϕ| = 1, we have what is called a unit root. In particular, if ϕ = 1, we have a random walk (without drift), which is not stationary. In fact, if |ϕ| = 1, the process is not stationary, while if |ϕ| < 1, the process is stationary. If |ϕ| > 1 the process increases over time. This process is a first-order autoregressive process, AR(1). The Dickey-Fuller test determines whether the process has a unit root.

The first step is to calculate the first difference: $Y_i - Y_{i-1} = \varphi Y_{i-1} + \varepsilon_i - Y_{i-1}$ which is simplified as: $Y_i - Y_{i-1} = (\varphi-1)Y_{i-1} + \varepsilon_i$. By using delta operator where $\Delta Y_i = Y_i - Y_{i-1}$ and $\beta = (\varphi-1)$, the above notation could be written as: $\Delta Y_i = \beta Y_{i-1} + \varepsilon_i$ where ß = 0 and so the test for ϕ is transformed into a test that the slope parameter ß = 0. Thus, we have a one-tailed test (since ß cannot be positive) where H0: ß = 0 (equivalent to ϕ = 1); and H1: ß < 0 (equivalent to ϕ < 1). Note that if $\beta = (\varphi-1)$ it means that ϕ = 1 + ϕ where ϕ is the slope coefficient for the AR model. The null hypothesis states that there the time series is not stationary; there is a unit root. The alternative hypothesis asserts that the data is stationary. The Dickey-Fuller test is used to test for unit root. There are three scenarios in Dickey-Fuller test: (i) Type 0 with no constant, no trend: $\Delta Y_i = \beta_1 Y_{i-1} + \varepsilon_i$; (ii) Type 1 with constant, no trend: $\Delta Y_i = \beta_1 + \beta_1 Y_{i-1} + \varepsilon_i$; and (iii) Type 2 with constant and trend: $\Delta Y_i = \beta_0 + \beta_1 Y_{i-1} + \beta_2 i + \varepsilon_i$.

Stochastic trend may cause the presence of unit root. Stochastic trend is one that can change in each run due to the random component of the process (Enders, 2010); a random walk always has a stochastic trend and the presence of unit root. The drift of the intercept (a0), for instance, shows the presence of unit root and proves that the time series is not a stable process (Campbell and Perron, 1991). Therefore, one way of testing for process stability is to look to the potential drift of the intercept (Dolado, Jenkenson, and Sosville-Reviero, 1990). Elder and Kennedy (2001) advocated the use of prior knowledge of the growth of the increase or decrease of the process and suggest F and T tests. Some approach for unit root test suggest the use of simulation (Hacker and Hatemi-J, 2010), or information criterion (Hacker, 2011). In this paper, we employed the Dickey-Fuller test and used |ϕ| = 1 as a reference threshold.

The conceptual framework for VAR model is constrained by the unit root testing. Unit root is the evidence that the time series data is not stable in a sense that the long-run equilibrium changes over time. This change makes the proposed VAR a poor predictive function. However, in this study of economic shock we expect that unit root will be present and the unit root will serve as an indicator to prove that the system is affected by the shock. COVID-19 pandemic and the war in Ukraine are negative shocks which effect the economies in the ASEAN countries. The pandemic reduces economic activities in the country for almost two years from 2020 to 2021; it was not until 2022 that the ASEAN started to emerge from the pandemic shock. In 2022, the global economy was sent into another shock by the war in Ukraine. Following economic sanctions against Russia, food and fuel prices rose; global inflation started to set in by mid-2022. VAR model help us to see a long-run time series from prior time period up until the shock point in 2021 for COVID-19 pandemic and 2022 for Ukraine war and international sanction against Russia. These two shock waves represent exogenous shocks that affect the ASEAN economies. By looking at the GDP growth rates, exchange rates, and fuel prices, we expect to see impulse response from endogenous factors to exogenous shock in the ASEAN region.

The general use of time series modeling is to obtain a predicting model under autoregressive (AR) method. However, in this paper, we used AR as a tool to provide use with a predictive function from which we could verify that there is a unit root. Unit root is an indicator that the time series data is not stationary. Data stationary is a stochastic process whose unconditional joint probability distribution does not change when shifted in time (Gagniuc, 2017). Stationary in time series data means stability. The presence of unit root means that the system is not stable. In this paper, we want to prove that the effects of shock cause the system to become unstable. This instability is proved by the existence of unit root in the time series. Therefore, our concern is to verify that unit root exists in AR(1); we are not seeking to adjust any lag periods in order to obtain a stationary process. The use of VAR to proof long-run trend and data stability through the use of unit root testing are well researched. However, to use the same modeling and testing for a different purpose is a novel approach to time series analysis. In this paper, we are using VAR model to verify a break in time series and we employed unit root testing to prove the significant effect of the exogenous shock in the ASEAN economies. This new use of existing econometrics is a contribution to the literature in economic research for the ASEAN economies.

Regime shift in macroeconomics

A regime is a characteristic behavior of a system that is maintained by mutually reinforced process. A GDP growth, for instance, is a complex system that is mutually maintained and reinforced by four components, namely, consumption (C), government spending (G), investment (I) and net trade (Export - Import). We try to answer whether the current COVID-19 pandemics causes a regime shift in the GDP growth rate in the ASEAN countries. Regime switching is defined as erupt and persistent in the structure and function of a system (Lwontin, 1969; Holling, 1973; Scheffer et al. 2001; and Biggs et al., 2009).

There are two types of regime switching: (i) threshold, and (ii) Markov models. According to Tong (1983), regime shift results from the change in the level of observed variables that exceeds an unobserved threshold. On the other hand, regime change may also come about according to Markov chain Goldfeld and Quandt (1973), Cosslett and Lee (1985), and Hamilton (1989). Threshold models attest that regime change may come from smooth change through internal process. For example, in GDP changes, the change of a country’s economic development as seen through its GDP level may result from growth over time, i.e. an underdeveloped economy graduated to a developing economy. This type of change is indicated by threshold model. However, a second type of change may come from erupt external shock (Scheffer et al., 2001; Scheffer and Carpenter, 2003; and Beusner et al., 2003). In this paper, we are looking into the external shock brought about by the COVID-19 pandemic and ask whether such sustained shock, since 2019 to the present, cause regime change in economic growth among the ASEAN countries.

There are many attempts to define regime shifts in the literature. In explaining regime shift, Collie *et al.* wrote that:

> “Three different types of regime shift (smooth, abrupt and discontinuous) are identified on the basis of different patterns in the relationship between the response of an ecosystem variable (usually biotic) and some external forcing or condition (control variable). The smooth regime shift is represented by a quasi-linear relationship between the response and control variables. The abrupt regime shift exhibits a nonlinear

relationship between the response and control variables, and the discontinuous regime shift is characterized by the trajectory of the response variable differing when the forcing variable increases compared to when it decreases (i.e., the occurrence of alternative "stable" states)." (Collie, J., et al., 2004)

According to Collie et al., regime shift is represented by low frequency but high amplitude event. It means that the frequency of the shock is less frequent but with each occurrence, the effect of the shock is big. Alternatively, regime shift may also be seen as an establishing of alternative state in relations to the referenced threshold level. According to Walker and Meyer (2004), "a regime shift involving alternate stable states occurs when a threshold level of a controlling variable in a system is passed, such that the nature and extend of feedbacks change, resulting in a change of direction (the trajectory) of the system itself. A shift occurs when internal processes of the system ... have changed and the state of the system ... begins to change in a different direction, toward a different attractor." In marine biology, this process may take up to 5 years to affect a regime shift (Norström et al., 2009). However, for an economic system the time required for regime shift under sustained exogenous shock, such as that of a pandemic, discussion in the literature is lacking.

In this paper, we will use Walker and Meyer's hypothesis of threshold model to test several regimes among the ASEAN countries individually and the ASEAN as a single economic community had experienced regime shift as the result of external shocks: COVID-19 pandemics and Russian-Ukranian war of 2022. The regimes that we will examine include GDP growth, inflation, and exchange rates.

Detecting regime shift

There are many possible methods used to detect regime shift, these methods include average standard deviates, principal component analysis, or artificial neural networks (Sonderegger, et al., 2009; and Anderson, et al., 2009). Other tools include dynamic models (Guunealp and Barlas, 2003; Saysel and Barlas, 2001) bayesian belief networks (Wooldridge et al., 2005), Fisher information (Karunganithi et al., 2008), and fuzzy cognitive maps (Kok, 2009). Common analytical approach to regime shift consists of defining the regime, and detecting shift. In this paper, we employed autoregressive model to inflation rates, exchange rate, oil prices, and GDP growth rate in order to verify regime change. We use statistical threshold of significance level to measure the response to shock. The threshold employed in this study is $p = 0.10$ which is consistent with the 10% band used by central banks for purposes of monitoring changes in exchange rates and implement intervention measures.

Regime shift or regime change occurs when there is a lack of resilience in the system (Folke et al., 2004). There had been claims that the ASEAN economy is resilient. In face of economic crisis, the ASEAN economy took and hit and rebound. In order for regime shift to occur, there is a weakening of the internal process that resulted in the loss of stability of the system. As a whole, the ASEAN economy may still show a goof feedback to exogenous shock; however, when looking at individual countries, some countries may show internal weakness could not stabilize its own system in face of prolonged external shocks. According to Scheffer and Carpenter (2003), regime shifts may come in three forms: smooth, abrupt or discontinuous. Coolie et al. (2004) explained that smooth change comes from a quasi-linear relationship between fast and slow processes; abrupt change is a non-linear relationship among fast and slow variables. Discontinuous change resulted when one of the variable changes at a faster rate. In our study of the ASEAN economy, detecting system shift must go beyond the examination of the GDP growth rates. The expansion or retraction of an economy is due to many factors. In this case study, we looked at inflation and exchange rate as additional factors.

In detecting regime shift, we may look at hysteresis as evidence of permanent change of the regime. Hysteresis is a phenomenon characterized by persistence of the effects after the initial causes giving rise to the effects are removed (Cross, 1993). For example, after negative shock unemployment remains higher even when the economy returns to normality (Blanchard and Summers, 1986). The regime shift in inflation and exchange rates in Laos and Myanmar may be explained by hysteretic phenomenon. These two ASEAN countries showed similar experience. Laos had its local currency traded against the US dollar at 8,500 LAK per one US dollar for a long period. However, after the COVID-19 the rate stood at 15,000 LAK/USD and still devalued further even after ASEAN had recovered from the pandemic. Another evidence of hysteresis in the ASEAN is Myanmar's valuation of its currency (MMK). In 2012, Myanmar pegged its currency to the IMF's SDR and equated MMK at 6.40 MMK per SDR; this imposition of SDR as a reference rate was seen by the market as a negative shock. In the subsequent months when the SDR was removed, the Myanmar currency bounced back to 850 MMK per US dollar. If regime shift in some ASEAN countries is hysteretic, it would be difficult to bring the economy back to its growth path.

In this paper, the theoretical framework for detecting regime shift is examined by the Dirac delta function. In impulse response concept, the exogenous shock, such as COVID-19 pandemic, economic crisis or Russian-Ukraine war, is an impulse or signal from outside. The economy is the system that responds to this signal, i.e. external shock. For instance, the dip in the year-to-year changes in GDP growth illustrated in Figure 1 is an example of impulse response to outside stimuli. We model the external shock to the system under the Dirac delta function.

The Dirac delta distribution is the unit impulse function; it is a generalized distribution over the real numbers, whose value is zero everywhere except at zero, and whose integral over the entire real line is equal to one. Assume that the economy at its normal state, without shock, is a function with zero shock everywhere on the number line where the number line representing a time series. When the shock is introduced, there is an impulse response (Arfken & Weber 2000; Dirac 1930; and Gelfand & Shilov 1966-1968).

We assume that prior to shock and reasonably near in time for the shock disturbance, the data series were normally distributed. Recall that the probability density function for the normal distribution is given by:

$$f(x)=\frac{1}{\sigma\sqrt{2\pi}}\exp\left(-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right) \tag{4}$$

By incorporating the Dirac delta function, for probability density f(x) of a discrete distribution, i.e. probability of the shock (0, 1) consists of x = {x1, ..., xn} with corresponding probabilities of p1, ..., pn, the probability density function with Dirac's delta function for the shock becomes:

$$g(x)=\sum_{i=1}^{n}p_i\delta(x-x_i) \tag{5}$$

We used the notation g(x) to differentiate the normal probability density function f(x) from the Dirac delta function interface. The Dirac delta function is a limit as $a \to 0$ where zero is the center of a distribution of the response (impulse response) to the shock, i.e. without the shock, there is no response; therefore, $a \to 0$. The response sequence is zero-centered distributions given by:

$$\delta_a(x) = \frac{1}{|a|\sqrt{\pi}} \exp(-x/a)^2 \qquad (6)$$

The value of a could only be $a \to 0$ but not equal to zero. If $a = 0$, it means there is no impulse response; it follows that there is no response because there is no shock. If there is shock or $a \neq 0$ there is a shock. The assumption that the impulse response portion of the line number creates a normal distribution predicates upon the fact that the economic infrastructure or production capacity of the economy has the ability for self correction and return to its position prior to shock. Under this argument, if the economy has poor productive capacity, the assumed normality of the impulse response in $\delta a(x)$ will break down enter a state of exponential decline and ultimately enters a state of economic chaos. This extreme case may follow a general exponential decline pattern: $N(t) = N_0 e^{-\lambda t}$ where N(t) is the quantity at time t; this may be equated GDP growth, N0 is the initial quantity at time t = 0, and λ is the constant decay or disintegration rate. This extreme condition may have described the loss of currency value of Germany in 1923, Zimbabwe in 2008-2009, Venezuela in 2018, and Sri Lanka in 2022. In this paper, we do not observe such extreme case, for the most part the impulse response by ASEAN countries to external shocks had been temporary so that the condition $a \to 0$ holds. The determination of a in the delta function is given by:

$$\delta(x) = \lim_{n \to \infty} \frac{1}{2\pi} \frac{\sin\left[\left(n + \frac{1}{2}\right)x\right]}{\sin\left(\frac{1}{2}x\right)} \qquad (6)$$

Note that the Dirac function, when incorporated into the continuous probability distribution function, is actually a discrete probability. The expression below is a mixture distribution. Assumed that the discrete frequency that returns a normal distribution is defined by the Laplace Rule of succession: $p = (s + 1) / (n + 2)$. The portion or segment of the data set whose distribution is normal is considered a condition where there is no shock. The remaining of the discrete frequency is $q = 1 - p$. The mixture distribution may be written as:

$$f(x) = P\frac{1}{\sqrt{2\pi}}\exp\left(\frac{-x^2}{2}\right) + Q\delta(x - x_i) \tag{7}$$

For a random variable that is transformed by continuous differentiable function $Y = g(x)$ the density function of Y is written as:

$$f_Y(y) = \int_{-\infty}^{+\infty} f_X(x)\delta(y - g(x)dx \tag{8}$$

In this paper, the variable that we looked at, such as GDP growth rate, interest rate, inflation, or any type of economic time series, we can defined such series as $Y = g(x)$ with a density function of $fY = (Y)$. We use the Dirac delta function as the basis for detecting regime shift. As a tool for detection, the impulse response under the Dirac delta function is that the response will follow a normal distribution pattern. If the response breaks this assumption, then there is an evidence of regime shift. Significance testing of the shift is accomplished by the F test.

Data and Methodology

We used the following data for our study of regime change and the effect of external shocks on the ASEAN economy: (i) inflation rates, (ii) exchange rate, (iii) oil prices, and (iv) GDP growth rate. Inflation indicates an increase in price level. When the price level increases unexpectedly, it may serve as an indicator of shock. ASEAN's economy is largely dependent on international trade, especially trading with major economies such as the US, EU area, Japan and China. Global inflation followed the war in Ukraine may effect import prices and affect intra-ASEAN growth. A second indicator of stability of the economy is the exchange rate.

The valuation of the local currency against the major currency of trading partner, such as US dollar, may serve as an indicator of stability and effectiveness of monetary policies in the ASEAN. In this study, we used the exchange rate to gauge how the local economies in the ASEAN community respond to two major events: COVID-19 pandemic and the war in Ukraine and its economic consequences after sanctions are imposed on Russia. Third, we saw the increase in oil prices after sanctions were imposed on Russia in 2022. The increase in fuel prices also led to increase in food prices and other primary input costs. The spike increase in oil prices indicates an external shock. This shock may have an effect on the overall production of the economy. ASEAN is a net oil importer; by using world oil price as an indicator for economic shock we can verify its effect on the economy.

Lastly, GDP growth rate is used as the macroeconomic indicator in response to external shock. ASEAN has ten countries; we examined economic growth through the GDP growth rates of ten countries. Normally, GDP growth rate following a long-term growth trend that is very stable; even id there is an exogenous shock, the effect of the shock is temporary, as we have seen in series of financial crisis. The GDP growth depends on the infrastructure and productive capacity of the country. Therefore, temporary shock normally does not lead to regime change. However, it is a good indicator to provide the level of the effect of the shock through the dip in the GDP growth rate.

Data characteristics

As a region, the ASEAN had an average expected GDP growth of 4.14 ± 1.37 in 2022 and this growth is churned away by inflation at a rate of 6.43 ± 3.98. In real term, the GDP in the ASEAN failed by -2.29%. By its nature, the GDP is expected to growth every year. External shocks such as global financial crisis, COVID-19 or the Russo-Ukranian war of 2022 exert temporary effect on the economies. We noted this observation in Figure 1 where the GDP growth in the ASEAN saw a dip followed each external shock (Russian financial crisis 2014-15 and COVID-19). In about three years after the event, the GDP growth returns to its original path. Since the GDP is expected to grow as a natural phenomenon of economic expansion in every country. Under our framework of regime shift, this constant growth may be classified as a constant shift. This type of shift is known as stochastic drift.

Global inflation is 9.10% during the third quarter of 2022 while the ASEAN is expected to have 6.43%. Since the ASEAN has uniform economic policy, each member country is left to deal with inflation by their own policy tools. We note that Laos (12.80%) and Myanmar (13.82%) are two countries that experienced the highest inflation rates among the group in 2022. Inflation rate of these two countries are higher that the global inflation rate.

Table 2: ASEAN Economic Data Characteristics during Critical Periods

ASEAN Countries	GDP Growth 2022	Inflation 2022	Average Exchange Rate		
			2020	2021	2022
Brunei	3.70	3.20	1.38	1.34	1.36
Cambodia	4.50	7.20	4,073.94	4,057.38	4,047.39
Indonesia	5.01	3.55	14,530.58	14,295.88	14,404.00
Laos	3.80	12.80	9,060.39	9,739.55	15,000.00
Malaysia	5.00	2.80	4.20	4.14	4.25
Myanmar	2.00	13.82	1,367.69	1,631.32	1,811.30
Philippines	6.50	5.40	49.57	49.27	51.88
Singapore	3.70	5.60	1.38	1.34	1.36
Thailand	2.20	7.10	31.30	32.03	33.50
Vietnam	5.03	2.86	23,235.85	22,930.48	22,880.24
ASEAN	4.14 ± 1.37	6.43 ± 3.98			

The worrisome economic conditions of Laos and Myanmar are also seen through the exchange rate for the past three years. At the midst of COVID-19 pandemic in 2020, the Lao currency was trading at 9,060.39 per US dollar and by 2022, it was trading at 15,000 LAK/USD. The LAK had been devalued by 65.56% in two years. In the same period, Myanmar's currency lost 32.48% of its value. We tested these two currencies for regime shift since it exceeds the 10% threshold of exchange rate managed float band.

Table 2 represents a preliminary look at the context of the most recent and current shock; from the COVID-19 pandemic to the Russian-Ukrainian war. For this paper, we examine 677 weeks of exchange rates to verify the stability of the exchange rate regime and test for potential regime shift among ASEAN countries. Additionally, for inflation and GDP growth rates, we also looked at a period of 30 years to allow a long-term perspective of data trends.

Regime shift detection testing

If regime shift could be summarized as a break from the long-run equilibrium path, then a shift could be detected in two ways: (i) consistent breaking away from older path as evidenced by significant change in the slope of the predictive function, and (ii) a string of data set is separated into two distinct segment, a comparison of these two segments confirm that there are significant differences. To verify shift under the first method, a times series autoregressive model may be used. In autoregressive, evidence of regime shift may be seen through unit root testing. The existence of unit root and larger lap periods suggest that the underlying fundamental basis for autoregressive time series modeling no longer bears fruit. Thus, the breaking down of the time series model is an evidence of regime shift. In the second method, data set bifurcation allow us to compare two subsets of data with equal or unequal length ($n_1 = n_2$ or $n_1 \neq n_2$), significant difference between the two segment may be achieved by the F statistic.

For non-parametric testing of statistical significance, we employed the F test by finding the ratio of the variances prior to the shock and during the shock where impulse response was expected. For instance, during the 2015 financial crisis and the Russian-Ukranian war in 2022. The F test for non-parametric case is given by: F = var1 / var2. After identifying the shock periods and the impulse response, we obtained the significance level by comparing the observe value of F to the theoretical value of F for the each regime and country in ASEAN. Recall that we examined: GDP growth, inflation, and exchange rates.

Findings and discussion

We detected a constant shift in the GDP. By its nature the GDP grows and the increase in the growth rate moves away from the long-term equilibrium over time. This is true for the ASEAN and for all countries in the world. The second regime that we examine for regime shift was inflation. We found that in some countries in the ASEAN, inflation is becoming a serious problem. As a regime, Laos and Myanmar experienced regime shift in inflation. The Lao economy is dependent on imports, weak exchange rate and global inflation made it impossible to control domestic price level. Since 2020 Laos had experienced regime shift in inflation. The remaining eight ASEAN economies experience inflation but not to the point where domestic inflation became a regime shift. The third regime we examined was exchange rate. The majority of the ASEAN currencies fluctuate within controllable band. However, since 2020 Laos began to experience severe devaluation of its currencies. Although the cause of this extreme devaluation ((15,000-8,500)*100 = 76.47%) of almost 80% had caused a significant exchange rate regime shift. Myanmar and Cambodia also experienced similar devaluation.

We organized our findings and discussion into two sections. In section 4.1, we reported the stability of the ASEAN economic under external shock by looking at the GDP, inflation and exchange rates. Our findings show that as a region, ASEAN is susceptible to external shock because much of its economic activities depend on international trade. As such, any crisis in the global market will have an effect in ASEAN economy. We also examined individual countries in the ASEAN and found that, certain countries are more vulnerable to exogenous shock. These countries included Laos and Myanmar. In section 4.2, we examined ASEAN’s need for international trade buffer against external shock by looking at China as a proxy buffer. The size and purchasing power of China may offer a practical alternative buffer economy for ASEAN countries.

Shock and stability of the ASEAN economy

We examined ASEAN as a group of ten economies. We looked at four indicators: GDP growth rates, inflations rate, trade balance, and interest rate. Using the Dirac delta function as the detector for impulse response and found that the ASEAN show no significant threat from the current external shock in 2022: global inflation and the Russo-Ukranian war. In Table 3 below, all indicators show probability of less that 0.50. We used 10% band to allow fluctuation within the group where the mean value of the Dirac delta function is used to verify the significance level.

The indication of impulse response shows how the economies responded to the exogenous shock. Significance test in Table 3 shows that all economies in the ASEAN region had impulse response to the external shock but the response was not significant during the period of Oil crisis in 2015, COVID-19 pandemic and Russian-Ukranian war of 2022. We found the lack of response in three regimes for the ASEAN region: GDP growth (p = 4404), inflation (p = 4013), trade balance (p = 4013) and interest rate (p = 4013). The current global inflation rate stands at 9.10% and the intra-regional inflation in the ASEAN is 6.43 +/-3.98 for the first quarter of 2022. On the surface, this may seem innocuous. However, some countries in the ASEAN experienced inflation higher than the group's average. For instance, in the second quarter of 2022, inflation in Laos rose to 12.80%; and 14.60% for Myanmar. In both countries, monetary officials do not actively intervene to stem the tide of inflation.

Table 3: Impulse Response among Three Main Economic Indicators

ASEAN Indicators	δ(x) Mean ± SD	P* (s+1)/(n+2)	Q 1 – P	Z(p,q)** DeMoivre-Laplace	F(z)*** Prob.
GDP growth	2.26 ± 1.05	0.33	0.67	(0.13)	0.4404
Inflation	1.87 ± 0.74	0.25	0.75	(0.17)	0.4013
Trade balance	4.38 ± 7.72	0.25	0.75	(0.18)	0.4013
Interest rate	2.63 ± 1.44	0.17	0.83	(0.23)	0.4013

* Threshold defined by 10% band for limit of fluctuation. **Z(p,q) is determined by the DeMoivre-Laplace Theorem: $Z = (x - np)/\sqrt{npq}$. ***F(z) is the percentage probability read from the Z table.

Although in Table 3 we reported that there are two dips in GDP growth rate changes in responses to western market shocks: one shock in 2015 as a consequence of the global oil price drop and another shock in 2021 as the result of the COVID-19 pandemic, our findings in Table 3 indicate that the shock did not rise to regime shifting effect. Although these two shocks represented economic crisis for the region, experience have shown that the GDO growth returns to its expected growth path within three years. In Table 3, we did not include exchange rates because there are ten different currencies in the ASEAN traded against the US dollar. We looked at the exchange rate for individual country and report them in Table 4.

In Table 4, we examined 677 weeks of spot rate of exchange rates among the ten currencies in the ASEAN and tested which currency had under gone exchange rate regime shift. Once the noticeable shift detection is made by the Dirac delta function, we proceeded to calculate the significance level under the F test. Shock is the external stimuli, a stable or capable economy is one that could effectively create an impulse response. This impulse response under the Dirac delta function may be seen through P success under the LaPlace Rule. The failure to muster an impulse response when faced with external shock is Q. Under this detection method, among the ten ASEAN countries, there are three countries that are responsive to external shock. These countries are Brunei (Q = 0.80), Indonesia (Q = 0.79) and Singapore (Q = 0.77). Higher level of Q in this case means that there is an effective response using 10% fluctuation band or 90% confidence interval where the critical value is Z = 1.28. A high level of response also means higher vulnerability to the effect of external shock.

Table 4: Detecting Response to Shocks in Exchange Rates for ASEAN Currencies

ASEAN Countries	$\delta(x)$ Dirac Delta Mean ± SD		P Impulse Resp.	Q Lack Resp.	2015 Shock		2022 Shock	
					F	Prob	F	Prob.
Brunei	1.63	0.77	0.20	0.80	1.76	0.0920	4.16	0.0210
Cambodia	5.25	27.74	0.03	0.97	2.08	0.0750	6.05	0.0070
Indonesia	12.17	119.38	0.01	0.99	3.73	0.0270	36.98	0.0000
Laos	5.91	71.15	0.00	1.00	75.14	0.0000	1.54	0.1070
Malaysia	1.11	0.54	0.21	0.79	2.79	0.0470	4.78	0.0140
Myanmar	9.34	98.44	0.01	0.99	7.43	0.0035	5.87	0.0080
Philippines	9.93	79.43	0.04	0.96	3.08	0.0400	21.43	0.0000
Singapore	1.61	0.78	0.23	0.77	1.78	0.0920	4.24	0.0200
Thailand	4.98	12.99	0.04	0.96	2.92	0.0440	6.51	0.0050
Vietnam	5.15	60.60	0.00	1.00	8.48	0.0019	7.78	0.0026

Table 4 explored two global crises: 2015 financial crisis caused by the oil price drop, and the Russian-Ukrainian war in 2022 that caused commodity prices and inflation to rise. Every country in the ASEAN were vulnerable to these two crises even under a stricter confidence of 0.95; in our threshold setting, we used the 10% band to allow manage float exchange rate to vary, and could still find significance of the shocks under 0.90 confidence interval. The average p-value for the shock of 2015 financial crisis was 0.0422 ± 0.04 and for the Russian-Ukranian war shock was 0.0185 ± 0.03. The ASEAN currencies are vulnerable to external shocks. The risks of exchange rate volatility are discussed in the literature. Exchange rate volatility is costly to the domestic economy through its direct and indirect effects on households and firms (Obstfeld and Rogoff, 1995). Research in EU countries revealed that exchange rate volatility has a negative impact on economic growth (Schnabl, 2008). At firm level, research also showed that exchange rate volatility has a significant growth reducing effect on manufacturing firms (Demir, 2013). In order to reduce their risk of exposure to exchange rate volatility, the ASEAN countries should consider diversify their foreign exchange reserve. We recommend a stable currency, such as the Chinese RMB as a potential anchor currency.

The second regime we examined was inflation. We used the US, China and world inflation rates over a period of 30 years as reference group. Unit root testing for times series data of these three data sets shows that China inflation rate is stationary at level, and the US and world inflation rates were near stationary with root indicator at 1.0045 and 1.0017, where 1.00 is the threshold point for stationary. We have conducted the same testing for data stationary for the ten countries in the ASEAN. We found that inflation pattern is stationary for Indonesia, Malaysia, and Vietnam. However, other countries (Brunei, Cambodia, Laos, Myanmar, Philippines, Singapore, and Thailand) showed non-stationary inflation rates over time. The quality of fit of the AR(1) model is determine by AIC indicator. The lower the AIC value the better the fit of the model. In this study only Indonesia that displayed high value of AIC (3.86).

China's inflation is data stationary with a unit root indication of 0.9988. Stationary inflation rate in times series AR(1) model means that China manages its domestic inflation effectively. This finding implies that, China is a good economic buffer zone against potential risk of inflation from the US and world economies. The US and world inflation time series showed that they are not stationary (ϕ = 1.0045 and 1.0017, respectively).

Table 5: Inflation Unit Root Testing and Model Fit Evaluation under AIC for AR(1)

Country	Time (yrs)*	Slope	Unit Root (ϕ)	AIC	RMSE
Brunei	40	0.00180	1.0018	-5.1131	0.0085
Cambodia	27	0.00031	1.0003	-2.262	0.0373
Indonesia	62	-0.00570	0.9943	3.8628	1.0241
Laos	33	0.00330	1.0033	0.5454	0.1605
Malaysia	62	-0.00032	0.9997	-3.9525	0.0179
Myanmar	60	0.00430	1.0043	-0.9712	0.0843
Philippines	61	0.00017	1.0002	-1.7861	0.0566
Singapore	61	0.00150	1.0015	-3.1945	0.0262
Thailand	62	0.00002	1.0000	-3.0923	0.0276
Vietnam	26	-0.00370	0.9963	-2.5504	0.0311

* Inflation rates availability varies by years per source of data; where *.* is country name. https://www.worlddata.info/asia/*.*/inflation-rates.php

Using the slope of AR(1) as the basis for calculating the Dirac delta, we verified the significant shift of the inflation rate regime for the ASEAN countries. There are three countries that are threatened by inflation regime shift; these countries are Cambodia, Laos and Vietnam. The threshold used for shift indication is the 10% band of fluctuation (Z* = 1.28). If the fluctuation band is allow to fluctuation at 20%, two additional countries would be included in the inflation regime shift group: Thailand and Malaysia. The summary of this finding is presented in Table 6.

Table 6: Inflation Regime Shift in ASEAN

Country	Time (yrs)*	Slope	Delta	Z	Prob.
Brunei	40	0.00180	127.06	(0.59)	0.2451
Cambodia	27	0.00031	86.35	(1.41)	0.0681
Indonesia	62	-0.00570	192.13	0.73	0.7670
Laos	33	0.00330	104.98	(1.03)	0.1379
Malaysia	62	-0.00032	196.24	0.82	0.7940
Myanmar	60	0.00430	187.84	0.65	0.7420
Philippines	61	0.00017	193.11	0.75	0.7730
Singapore	61	0.00150	192.84	0.75	0.7730
Thailand	62	0.00002	196.25	0.82	0.7940
Vietnam	26	-0.00370	83.08	(1.48)	0.0599

The ASEAN Economic Community (AEC) proclaims to create a common market among the ASEAN countries. The so-called “economic community” remains unequal in terms of economic development. The late members (Cambodia, Laos, Myanmar and Vietnam) lack the economic strength to face the effects of external shocks. These countries are more vulnerable to exogenous shocks, such as financial crisis, global inflation, or pandemics. Older ASEAN member countries may have adequate productive capacity to cushion themselves through crisis; nevertheless, they are also vulnerable to the effects of external shock due to their high level of dependence on western market for export markets. The needs for a buffer economy in the region deserve serious consideration. This paper urges stakeholders to consider a large economy that could serve as an export market and help to provide cushion against western market shocks. China is large enough to serve this buffer function. The currently global financial system depends on the US dollar for international trade. When the US experiences economic problem, such inflation in 2022 and the raising of interest rates by the Federal Reserve, the entire ASEAN loses its economic value and trade advantages due to rising value of the US dollar and the corresponding devaluation of the local currencies. If the ASEAN economies change its trade outlook to balance the US dollar with China’s RMB, this type of dollar shock would be cushioned by the RMB. The strength and stability of the RMB makes the idea of using China was an economic buffer for the ASEAN the more attractive.

ASEAN's need for international economic buffer against external shock

We note that when there is dip in the GDP growth rate, the decrease endures for a period of three years and it also takes another three years to reclaim its regional baseline. In conventional time series modeling, this would have been an evidence of integration at lag period of 3 years. For example, in Fig. 1, there was a financial crisis in 2014-2015 caused by the Russian sanction post-Crimean annexation and oil price drop of 2014; this lowest point in 2015 started the decline three years earlier. The ASEAN growth started to decline in 2012. Likewise, the most recent minimal point in 2020 was a result of the COVID-19 pandemic that started in 2019. This case took only one year to see the rapid decline in 2020 and then by 2021 the ASEAN was on its way to recovery. The 2008 crisis had its lowest point in 2009 and recovery was regained in 2010; that crisis lasted three years. In 2001, we saw the Dotcom bubble burst but ASEAN was not affected. The Asian financial crisis of 1997 saw its regain in 2000; a period of three years was required for recovery. It can be generalized that, it normally takes ASEAN three years to recover from economic crisis. With the exception of the Asian financial crisis of 1997, economic crisis that affected the ASEAN economies had its origin outside of the ASEAN market. This evidence ASEAN's lack of resistance to external shock. A claim of ASEAN economic resilience is not meaningful because the bouncing back of the economy after crisis is due to the intrinsic and fundamental infrastructure of the economy. Specifically, economic output affects the demand for the production output from ASEAN but did not affect the productive capacity of the ASEAN. In the context of regime change, in general economic crisis does not lead to regime change because the productive capacity of the economy is untouched by the crisis. While the crisis may decrease demand for output from ASEAN, the productive capacity in ASEAN is not affected because these assets are in place and ready for production when and if demand is presented. However, the current situation that we face since 2020 is back-to-back global crisis. First, the global economy was faced with COVID-19 pandemic that spun the global economy into crisis in 2020; upon recovery in 2021 another crisis was present in the beginning of 2022---Ukrainian war. The sanctions against Russia wreak havoc on the global economy by causing the increase in fuel and food prices. By mid 2022, the war in Ukraine still rages and sanctions against Russia deepens. The World Bank warns of the possibility of global inflation. The US is also on the verge of recession with inflation stood at 8.6%. How would this global market condition affect ASEAN's economic health? It is a foregone conclusion that ASEAN economies will be adversely affected. If 2022 is the middle of crisis, we should expect to see the bottom of this depression in 2023 and, from prior pattern of recovery, ASEAN should start to see recovery in 2025. Coincidentally, ASEAN's community vision statement targeted the year 2025 to achieve its aim:

> "Our ASEAN Economic Community by 2025 shall be highly integrated and cohesive; competitive, innovative and dynamic; with enhanced connectivity and sectoral cooperation; and a more resilient, inclusive, and people-oriented, people-centred community, integrated with the global economy." Statement no. 9, p. 15.

In face of the current crisis in 2022, it is likely that the ASEAN Economic Community will miss most of its economic targets:

> "A highly integrated and cohesive regional economy that supports sustained high economic growth by increasing trade, investment, and job creation; improving regional capacity to respond to global challenges and mega trends; advancing a single market agenda through enhanced commitments in trade in goods, and through an effective resolution of non-tariff barriers; deeper integration in trade in services; and a more seamless movement of investment, skilled labour, business persons, and capital ..." Statement no. 10.1, p. 15.

Economic "cohesiveness" might not be achieved because there is no unified policy to tackle external shocks. For example, there is no uniform policy to tackle the problem of inflation in the cost of food and fuel in 2022. ASEAN's aim to improve regional capacity to respond to global challenges is recognition that there is a lack of regional and cohesive plan of action to respond to global challenges. One critical challenge faced by all ASEAN member countries in 2022, in the midst of global inflation and recession, is left to individual member state to deal with the challenge. There is no regional response. Laos, for instance, faces near economic collapse with its excessive devaluation of its currency and rising inflation. Myanmar is another ASEAN country that faces serious problem.

The seriousness of Myanmar's economic declined was best underscored by the World Bank's warning:

> "After the sharp decline in incomes and employment observed across the economy, available indicators suggest domestic demand remains very weak. At the same time, supply-side constraints persist and some have worsened in recent months. Access to kyat liquidity, credit, and foreign currency remains severely constrained. A sharp exchange rate depreciation in September 2021 has raised import prices across the economy, including of fuel and other critical inputs to production, increasing transport costs." (World Bank, 2022).

The ASEAN Economic Community lacks unified economic policy for the group. Although there is a common goal to reap economic benefits from the economic community; however, when it comes to policy tools to achieve such goals, the ASEAN countries still cannot withstand external shock from the western market. This paper offers the concept of "economic buffer" zone as a physical market to help adsorb the effects of external shocks from western markets, i.e. US, and EU area. We propose the alignment of trade and increase economic activities between the ASEAN and China. China can serve as an economic buffer for the ASEAN economies.

We are also aware of the argument that, in an analogy to political buffer, the buffer state will end up in being conquered by greater contesting powers (Fazal, 2004). Likewise, by re-aligning trade policies and activities with China, one or more states or the entire ASEAN market may come under the influence of or being dependent upon China. This possibility may be balanced by retaining trade relationships with western market. The problem with the current dependent on the Western market is that ASEAN has no way of lessening the effect of western economic crises. By including China into its trade portfolio, the ASEAN could better minimize the treats from shocks in western markets.

We find support to our proposed economic buffer within the ASEAN. Brunei pegs with currency on the Singapore dollar in order to prevent any negative shocks from the international market on its currency. This practice had been successful for Brunei because relative to Brunei, Singapore has larger economy and the most stable currency in the ASEAN. Other forms of economic buffer could also be seen outside of the ASEAN. For instance, the following countries opted for the US dollar as the official currency: Ecuador, El Salvador, Zimbabwe, Micronesia, and Panama. In these countries, the US dollar is used as the buffer against the devaluation of the local currency. By adopting the US dollar, the value of the currency depends on the US economy. Assuming that the US economy is stable, the US dollar serves as an efficient buffer and the worry of exchange rate fluctuation is eliminated. Likewise the proposed economic buffer using China as a market, ASEAN will access a market with a size of 19.91 trillion US dollars. In additional to the physical market, ASEAN must denominate their trade with China in RMB and move away from USD as medium of exchange. Larger market and stable currency offers a potential economic buffer that can help ASEAN from feeling the heat of economic crisis in the western market. This proposed buffer market will also address the problem of lacking unified voice in economic policy among ASEAN states.

Under Markowitz' modern portfolio theory, the use of different assets in the portfolio us a better risk management tool than holding one kind of assets (Markowitz, 1952). Presently, the ASEAN predominantly exports its products to the western markets, i.e. US and EU area. More recently, trade and investment activities between China and the ASEAN had increase. However, these activities are limited to bilateral basis. Although they had been classified as ASEAN-China trade and investment activities, there is no unified policy. The current ASEAN-China trade and investment activities remained informal and bilateral. They should be codified into formal arrangement so that China will become a strategic partner for ASEAN countries. As an economic buffer for the ASEAN, China will help balance ASEAN's economic dependence in western markets and help lessen the effect of shock by western market fluctuation.

At the end of 2021, ASEAN's export figure to the US was 15.20% and to China was 15.7%. According to this figure, this appears to be a well-balanced portfolio. However, all trades are denominate in US dollars. Even exports to China are also denominated in US dollars. In addition to shifting the market focus to China, part of the buffer must also be foreign currency reserves holding in RMB so that ASEAN countries could avoid the risk associated with US dollar. In this same period, the US accounts for 7.7% and China 23.5% for imports into the ASEAN (ASEAN Key Figures, 2021). The ASEAN runs 7.80% trade deficit with China. In order to rely on China as a buffer against western market shock, the ASEAN must work to achieve balance of trade and de-dollarize its trade with China. A less risky currency for trade is the Chinese RMB which had been stable over the long run.

At this exploratory stage of the idea of using China as an economic buffer zone, we recommend the following macro-policy direction:

1. *Unified trade policy towards China.* ASEAN must have unified trade policy whereby China is used as an alternative and supplemental market to the US and EU area. As such, China is a regional economic balancer allowing the ASEAN to be more independent from western market and, thus, distance itself from the economic and financial shocks from western market.

2. *Adoption of RMB and de-dollarization in regional trades.* ASEAN must have unified practice of using the Chinese RMB as a currency of choice in international trade. This denomination of trade in RMB will allow the ASEAN to be independent from the US dollar and free the local currencies from the active intervention by the US Federal Reserve. For instance by mid-2022, the US Federal Reserve had raised interest more then seven times. This rise of interest rate in the US had caused several currencies in the ASEAN to devalue. For instance, the Thai Baht, Myanmar Kiat, Laotian Kip, and Vietnamese dong had loss value against the US dollar. In turn, the devaluation of the local currencies in response to the rising interest rate in the U.S., exposes the ASEAN economies to further risk. If the ASEAN had increase trade with China and the trade activities are denominated in RMB, the devaluation of the local currencies in the ASEAN in 2022 would have been less significant. This loss is preventable had the ASEAN found an effective buffer against the effect of the financial and economic turmoil of the west.

3. *Common ASEAN monetary policy goals.* Common monetary policy in the ASEAN is necessary for holding the Chinese RMC as a foreign exchange holding. Presently, RMB is one of the five main currencies in the IMF's basket of currency of Special Drawing Rights. RMB constitutes 12.28% of that basket compared to 43.38% by USD, 29.31% by EUR, 7.59% by JPY, and 7.44% by GBP. By including the Chinese RMB into their foreign exchange reserves, the ASEAN economies could avoid the risk of unnecessary currency devaluation risk. China's currency is stable. Exchange rate stability is characterized by the lack of significant fluctuation. The fluctuation is significant at $p > 0.10$ for a 10% allowable band of fluctuation for managed float. By examining the RMB traded against

the US dollar in the past 677 weeks, we found that RMB stays without its central limit within 5.56% which is well within the limit of 10% of managed float exchange rate regime. Since 1994, China pegged its RMB to the US dollar at a rate of 8.28 to one dollar. In 2022, the RMB was trading 6.45 ± 0.15 against the dollar.

Conclusion

This paper intended to answer the question of whether exogenous shock may lead to regime change in the local economy. We examined ASEAN as an economic unit and also looked at individual member states. ASEAN as a 'cohesive' unit, regime change may be absent; however, among individual states, we saw that Cambodia, Laos and Vietnam are vulnerable to regime changes in inflation. In the exchange rate regime, all ASEAN countries are exposed to the risk of exchange rate fluctuation because they are heavily dependant on US dollar for their exchange rate reserves holding. We recommend ASEAN stakeholders to consider China as a potential economic buffer against western market shocks.

References

Arfken, G. B.; Weber, H. J. (2000). Mathematical Methods for Physicists (5th ed.), Boston, Massachusetts: Academic Press, ISBN 978-0-12-059825-0, p. 84.

Andersen, T., et al. (2009). Ecological thresholds and regime shifts: approaches to identification. *Trends Ecol. Evol, 24*, 49-57.

Ang, Andrew, and Geert Bekaert. (2002). International Asset Allocation with Regime Shifts. *Review of Financial Studies, 15*, 1137-1187.

ASEAN COMMUNITY VISION 2025. (2022). statement no. 9, p. 15. https://www.asean.org/wp-content/uploads/images/2015/November/aec-page/ASEAN-Community-Vision-2025.pdf Accessed: July 7, 2022

ASEAN KEY FIGURES 2021; p. 43. https://www.aseanstats.org/wp-content/uploads/2021/12/ASEAN-KEY-FIGURES-2021-FINAL-1.pdf. Accessed: July 18, 2022.

Beisner, B., et al. (2003). Alternative stable states in ecology. *Front. Ecol. Environ. 1*, 376-382.

Biggs, R., et al. (2009). Turning back from the brink: Detecting an impending regime shift in time to avert it. *P. Natl Acad Sci USA, 106,* 826-831.

Blanchard, Olivier J.; Summers, Lawrence H. (1986). Hysteresis and the European Unemployment Problem. *NBER Macroeconomics Annual. 1*, 15-78. JSTOR 3585159.

Campbell, J. Y.; Perron, P. (1991). Pitfalls and Opportunities: What Macroeconomists Should Know about Unit Roots. *NBER Macroeconomics Annual, 6*(1), 141-201. doi:10.2307/3585053. JSTOR 3585053. https://dash.harvard.edu/bitstream/handle/1/3374863/campbell_pitfalls.pdf?sequence=2

Cerra, Valerie, and Sweta Chaman Saxena. (2005). Did Output Recover from the Asian Crisis? *IMF Staff Papers, 52,* 1-23.

Collie, J., et al. (2004). Regime shifts: can ecological theory illuminate the mechanisms? Prog. *Oceanogr, 60,* 281-302.

Collie, J., et al. (2004). Regime shifts: can ecological theory illuminate the mechanisms? Prog. *Oceanogr, 60*, 281-302.

COVID-19: ‘Unparalleled economic shock’ threatens development hopes and gains https://www.un.org/es/desa/covid-19-%E2%80%98unparalleled-economic-shock%E2%80%99-threatens-development-hopes-and-gains (Accessed: March 7, 2022).

Cosslett, S. R. and L.-F. Lee. (1985). Serial Correlation in Discrete Variable Models. *Journal of Econometrics, 27,* 79-97.

Cross, Rod. (1993). On the Foundations of Hysteresis in Economic Systems. *Economics and Philosophy. 9*(1): 53-74. doi:10.1017/S0266267100005113.

Davig, Troy. (2004). Regime-Switching Debt and Taxation. *Journal of Monetary Economics, 51*, 837-859.

Demir, F. (2013). Growth under exchange rate volatility: Does access to foreign or domestic equity markets matter?. *Journal of Development Economics, 100*(1), 74-88. https://doi.org/10.1016/j.jdeveco.2012.08.001

Dickey, D. A.; Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association, 74*(366), 427-431. doi:10.1080/01621459.1979.10482531. JSTOR 2286348.

Dirac, Paul. (1930). *The Principles of Quantum Mechanics* (1st ed.), Oxford University Press; §22 The d function.

Dolado, J. J.; Jenkinson, T.; Sosvilla-Rivero, S. (1990). Cointegration and Unit Roots. *Journal of Economic Surveys, 4*(3), 249-273. doi:10.1111/j.1467-6419.1990.tb00088.x. hdl:10016/3321.

Elder, J.; Kennedy, P. E. (2001). Testing for Unit Roots: What Should Students Be Taught?. *Journal of Economic Education, 32*(2), 137-146. CiteSeerX 10.1.1.140.8811. doi:10.1080/00220480109595179. S2CID 18656808.

Enders, Walter. (2010). *Applied Econometric Time Series* (3rd ed.). New York: Wiley, pp. 206-215. ISBN 978-0470-50539-7.

Fazal, Tanisha M. (2004-04-01). State Death in the International System. *International Organization, 58*(2), 311-344. doi:10.1017/S0020818304582048. ISSN 1531-5088. S2CID 154693906.

Folke, C., et al. (2004). Regime Shifts, Resilience, and Biodiversity in Ecosystem Management. *Annu. Rev. Ecol. Evol. Syst, 35*, 557-581.

Gagniuc, Paul A. (2017). *Markov Chains: From Theory to Implementation and Experimentation.* USA, NJ: John Wiley & Sons, pp. 1-256. ISBN 978-1-119-38755-8.

Gelfand, I. M.; Shilov, G. E. (1966-1968), Generalized functions, vol. 1-5, Academic Press, ISBN 9781483262246; Volume I, §1.1.

Goldfeld, S.M. and R.E. Quandt. (1973). A Markov Model for Switching Regressions. *Journal of Econometrics, 1*, 3-16.

Guneralp, B., and Barlas, Y. (2003). Dynamic modelling of a shallow freshwater lake for ecological and economic sustainability. *Ecological Modelling 167*, 115-138.

Hacker, R. S.; Hatemi-J, A. (2010). The Properties of Procedures Dealing with Uncertainty about Intercept and Deterministic Trend in Unit Root Testing, CESIS Electronic Working Paper Series, Paper No. 214. Centre of Excellence for Science and Innovation Studies, The Royal Institute of Technology, Stockholm, Sweden. https://ideas.repec.org/p/hhs/cesisp/0214.html

Hacker, Scott. (2010). The Effectiveness of Information Criteria in Determining Unit Root and Trend Status. Working Paper Series in Economics and Institutions of Innovation. Stockholm, Sweden: Royal Institute of Technology, CESIS - Centre of Excellence for Science and Innovation Studies. 213. https://ideas.repec.org/p/hhs/cesisp/0213.html

Hamilton, J. D. (1989). A New Approach to the Economic Analysis of Nonstationary Time Series and the Business Cycle. *Econometrica, 57*, 357-384.

Hamilton, James D. (1994). Difference Equations. *Time Series Analysis.* Princeton University Press. p. 5. ISBN 0-691-04289-6.

Hatemi-J, A. (2014). Asymmetric generalized impulse responses with an application in finance. *Economic Modelling, 36*, 18-2. doi:10.1016/j.econmod.2013.09.014.

Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics, 4*, 1-23.

Karunanithi, A. T., et al. (2008). Detection and Assessment of Ecosystem Regime Shifts from Fisher Information. *Ecol. Soc, 13,* 15.

Kok, K. (2009). The potential of Fuzzy Cognitive Maps for semi-quantitative scenario development, with an example from Brazil. *Global Environmental Change, 19,* 122-133.

Levene, Howard. (1960). Robust tests for equality of variances, In Ingram Olkin; Harold Hotelling; et al. (eds.). *Contributions to Probability and Statistics: Essays in Honor of Harold Hotelling,* Stanford University Press, pp. 278-292.

Lewontin, R. (1969). Meaning of Stability. *Brookhaven Sym Biol, 13.*

Markowitz, H. M. (March 1952). Portfolio Selection. *The Journal of Finance, 7*(1), 77-91. doi:10.2307/2975974. JSTOR 2975974.

Norström, A., et al. (2009). Alternative states on coral reefs: beyond coral–macroalgal phase shifts. *Mar. Ecol. Prog. Ser, 376,* 295-306.

Obstfeld, M., and Rogoff, K. (1995). Exchange rate dynamics redux. Journal of Political Economy. *Journal of Political Economy,* 1995, *103*(3), 624-60. https://doi.org/10.1086/261997

Olivier, J. and Masson, P. (2000). Currency Crises, Sunspots, and Markov Switching Regimes. *Journal of International Economics, 50*, 327-350.

Saysel, A. K., and Barlas, Y. (2001). A dynamic model of salinization on irrigated lands. *Ecological Modelling, 139*, 177-199.

Scheffer, M., Carpenter, S., Foley, J. A., Folke, C., and Walker, B. (2001). Catastrophic Shifts in Ecosystems. *Nature, 413*, 591-596. doi:10.1038/35098000

Scheffer, M., and Carpenter, S. (2003). Catastrophic regime shifts in ecosystems: linking theory to observation. *Trends Ecol. Evol, 18*, 648-656.

Scheffer, M., and Carpenter, S. (2003) Catastrophic regime shifts in ecosystems: linking theory to observation. *Trends Ecol. Evol, 18*, 648-656.

Schnabl, G. (2008). Exchange rate volatility and growth in small open economies at the EMU periphery. *Economic Systems, 32*(1), 70-91. https://doi.org/10.1016/j.ecosys.2007.06.006

Sims, Christopher, and Tao Zha. (2004). Were There Switches in U.S. Monetary Policy?, working paper, Princeton University.

Sims, Christopher. (1980). Macroeconomics and Reality. *Econometrica, 48*(1): 1-48. CiteSeerX 10.1.1.163.5425. doi:10.2307/1912017. JSTOR 1912017.

Sonderegger, D. L., et al. (2009) Using Sizer to detect thresholds in ecological data. Front. *Ecol. Environ, 7*, 190-195.

Viktorov, Ilja; Abramov, Alexander. (2020). The 2014-15 Financial Crisis in Russia and the Foundations of Weak Monetary Power Autonomy in the International Political Economy. *New Political Economy, 25*(4), 487-510. doi:10.1080/13563467.2019.1613349. S2CID 181478681.

Walker, B., and Meyers, J. (2004). Thresholds in ecological and socialecological systems: a developing database. *Ecol. Soc, 9*, 3.

Wooldridge, S., et al. (2005). Precursors for resilience in coral communities in a warming climate: a belief network approach. *Mar Ecol-Prog Ser, 295*, 157-169.

World Bank. (2022). Myanmar Economic Monitor, January 2022: Contending with Constraints.

World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/36889 License: CC BY 3.0 IGO. https://openknowledge.worldbank.org/handle/10986/36889Accessed: July 7, 2022

Zimmermann, Donald W. (2004). A note on preliminary tests of equality of variances. *British Journal of Mathematical and Statistical Psychology, 57*(1), 173-81. doi:10.1348/000711004849222.

Revisiting Talent Acquisition Strategies in the Digital Age

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Abstract

The digital era has transformed talent acquisition landscapes, presenting organizations with emerging opportunities and challenges in attracting top talent. This paper outlines an examination of talent acquisition practices in the digital era, focusing on the importance of technologies and emerging recruitment strategies, and employer branding. The paper highlights emerging trends and issues in talent acquisition by discussing the transformative impact of digital technologies on current hiring practices. It also explores how organizations are leveraging technologies such as artificial intelligence, and data analytics to synchronize recruitment processes, improve decision-making, and elevate overall recruitment experiences. Concerns regarding the ethical implications such as biases and transparency associated with these technologies are also discussed. Nevertheless, the paper investigates the increasing importance of employer branding and how to leverage digital plat-forms to promote strong and compelling employer brands. The importance of diversity and inclusion in digital talent acquisition is also addressed. It highlights the potential biases embedded in algorithmic tools and proposes the need for fair and inclusive hiring practices, including the promotion of equal employment opportunities. Analysis was conducted to portray the impact of the COVID-19 pandemic on talent acquisition. It examines the shift towards remote hiring, virtual

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onboarding, and the challenges of maintaining conducive organizational culture in a virtual workplace environment. It also underscores the need for further investigation of the long-term impact of the pandemic on talent acquisition practices. The paper identifies future research directions to advance the field of talent management in the modern era, including studies of the effectiveness of digital recruitment methods and the ethical implications of technology-driven talent acquisitional practices. evaluating the ethical implications of technology-driven practices, and investigating the role of artificial intelligence in candidate assessment.

Keywords: Recruitment and Selection, Talent Management, Talent Acquisition, Digital Era, Talent Strategies, Employer Branding

การทบทวนกลยุทธ์เพื่อสรรหาคนเก่งในยุคดิจิทัล

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บทคัดย่อ

ยุคดิจิทัลได้ปฏิวัติวิธีการจัดหา นำเสนอโอกาสและความท้าทายใหม่ ๆ ให้กับองค์กรในการดึงดูดและคัดเลือกคนเก่ง (Talent) บทความนี้นำเสนอการได้มาซึ่งบุคลากรผู้มีความสามารถสูงในยุคดิจิทัล ซึ่งมุ่งเน้นไปที่การบรรจบกันของเทคโนโลยี กลยุทธ์การสรรหา และประสบการณ์ของผู้สมัคร โดยการสังเคราะห์วรรณกรรมที่เกี่ยวข้องรวมทั้งแนวปฏิบัติที่ดีขององค์กร โดยเน้นแนวโน้มที่เกิดขึ้นใหม่และประเด็นต่างๆ ในการได้มาซึ่งคนเก่งเหล่านี้ โดยอภิปรายผลกระทบการเปลี่ยนแปลงของเทคโนโลยีดิจิทัลต่อการสรรหาบุคลากร โดยจะสำรวจว่าองค์กรใช้ประโยชน์จากเทคโนโลยีต่าง ๆ เช่น ปัญญาประดิษฐ์ และการวิเคราะห์ข้อมูลขนาดใหญ่เพื่อปรับปรุงกระบวนการสรรหา ปรับปรุงการประเมินผู้สมัคร และการตัดสินใจ ซึ่งก็ยังพบข้อกังวลเกี่ยวกับประเด็นทางจริยธรรม เช่น อคติและความโปร่งใสที่เกี่ยวข้องกับเทคโนโลยีเหล่านี้ นอกจากนี้ยังเน้นย้ำความสำคัญของการสร้างภาพลักษณ์และแบรนด์นายจ้างที่แข็งแกร่งโดยใช้ประโยชน์จากแพลตฟอร์มดิจิทัลเพื่อดึงดูดและดึงดูดผู้สมัคร ความท้าทายและโอกาสในการสร้างแบรนด์ของนายจ้างในยุคดิจิทัลนั้น รวมถึงความสำคัญของการเล่าเรื่องราว ความสอดคล้องและสม่ำเสมอในการสื่อภาพลักษณ์ของแบรนด์นายจ้าง และผลกระทบของสื่อโซเชียลมีเดียที่มีต่อการรับรู้ของผู้สมัคร ความหลากหลายของผู้สมัครและการคัดสรรอย่างครอบคลุมนับเป็นประเด็นที่มีความสำคัญอย่างยิ่งเช่นกัน บทความชี้ให้เห็นถึงอคติที่อาจฝังอยู่ในเครื่องมือที่ใช้ในการสรรหาและคัดเลือกด้วยเทคโนโลยีอัลกอริทึมที่แสดงให้เห็นถึงความจำเป็นในการประยุกต์ใช้เทคโนโลยีเพื่อให้ได้มาซึ่งกระบวนการในการคัดเลือกที่มีความชอบธรรม นอกจากนี้ยังทบทวนบทบาทของแพลตฟอร์มดิจิทัลในการขยายฐานการเข้าถึงกลุ่มคนเก่งผู้มีความสามารถหลากหลาย พร้อมเสนอกลยุทธ์ในการลดอคติและแนวทางในการส่งเสริมโอกาสอย่างเท่าเทียมและเป็นธรรม บทความนี้ยังพิจารณาผลกระทบของการระบาดใหญ่ของโรคโควิด-19 ต่อการได้มาซึ่งบุคลากรคนเก่ง โดยพิจารณาถึงการเปลี่ยนแปลงสู่การจ้างงานนอก

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สถานที่ทำงาน แนวปฏิบัติในการดำเนินการปฐมนิเทศงานออนไลน์ และความท้าทายในการธำรงรักษาวัฒนธรรมขององค์กรและประสบการณ์ของผู้สมัครในระบบออนไลน์ การศึกษานี้สะท้อนความจำเป็นในการศึกษาและวิจัยเพิ่มเติมเกี่ยวกับผลกระทบระยะยาวของการแพร่ระบาดต่อกลยุทธ์การจัดหาคนเก่งผู้มีความสามารถ รวมถึงโอกาสและความท้าทายที่องค์กรต้องเผชิญเพื่อเพิ่มประสิทธิภาพของกลยุทธ์การสรรหาและคัดเลือกคนเก่ง โดยเสนอประเด็นเพื่อเสริมองค์ความรู้ อาทิ การพัฒนาขีดความสามารถเพื่อยกระดับประสบการณ์ของผู้สมัคร การส่งเสริมแนวปฏิบัติที่ดีในการสรรหาบุคลากรอย่างครอบคลุมและเป็นธรรมในยุคดิจิทัล การประเมินผลกระทบด้านจริยธรรมบนแนวปฏิบัติที่ขับเคลื่อนด้วยเทคโนโลยี และการตรวจสอบบทบาทของปัญญาประดิษฐ์ในการประเมินผู้สมัคร

คำสำคัญ: การสรรหาและคัดเลือก การจัดการคนเก่ง การสรรหาคนเก่ง ยุคดิจิทัล กลยุทธ์ แบรนด์นายจ้าง

Introduction

The digital transformations have resulted in modified talent acquisition practices, by lever-aging digital technologies to attract and evaluate talents. Such a move presents both challenges and opportunities for recruitment and selection in the new era. One challenge is the volume of applica-tions received with the ease of submission created by the digital platforms and strategies to manage this becomes essential. Effective screening mechanisms enhance the reliability of online screening and assessment processes (Doe, 2018). Despite such challenges, organizations could extend their outreach to a wider talent pool beyond geographic areas. Digital platforms utilize the networks that expand to connect with potential candidates, no matter where they are residing. For instance, LinkedIn enables users to create their profiles with set-ups that let them share relevant information based on preference, in turn facilitating networking and data exchange between employers and job seekers in a secure environment (Dineen & Allen, 2013). The built-in features even allow them to recommend or received recommendations from supervisors and colleagues. The emergence of online job boards and networking portals offer both parties to expand their search and look for op-portunities based on the abundance of big data stored online (Marchal et al., 2007), thereby improving the efficiency of the hiring process through the utilization of information (Parry & Wilson, 2009).

Organizations may also boost their brand identities and share meaningful messages with candidates, allowing them to understand the core values and mission from publicly available information on websites. Many organizations are cognizant of the need to effectively communicate their values, culture, and opportunities through digital channels to attract the right talent. Compelling employer branding messages and a positive online presence are thus essential. Second, organizations should carefully select and utilize digital platforms aligned with their recruitment goals and target audience. Different platforms offer distinct features, demographics, and engagement levels. Understanding the target talent pool and choosing relevant platforms enhances reach, engagement, and visibility among potential candidates. Lastly, the ethical use of data analytics is vital in recruitment and selection. While data provides valuable insights, organizations must ensure privacy and data protection. Adhering to regulations, transparent data practices, and mitigating biases in decision-making processes are crucial for fairness and inclusivity (Doe, 2018).

In today's work environment, many organizations face the need to adapt their talent acquisition strategies to further engage with contract workers such as gig workers and freelancers. They may utilize online platforms and talent intermediaries to access these highly-sought talents. The dynamism of talent recruitment terrains has led to the need for targeted hiring approaches, including talent mapping and relationship building with potential candidates who may not consider job switching at that moment. Technology advancements allow new innovative acquisitional tools to flourish, making the processes more synchronized and efficient, elevating data-driven tools to aid informed decision-making. The availability of candidate and job-related data allows organizations to analyze the insights to support enhanced recruitment outcomes (Stone et al., 2015). Data analytics and predictive modeling approach enable organizations to identify patterns, spot trends, and synthesize performance indicators that contribute to their decision-making regarding hiring (Fali-agka et al., 2012). Such tools expand the variety of choices and alternatives for hiring managers and recruiters alike so that they could select the tool most suitable for their needs and circumstanc-es.

Talent acquisition in the new era is influenced by macro-level trends such as global economic conditions, demographic shifts, and technological advancements. The operative environment, encompassing internal factors like organizational goals and culture, as well as external factors like the gig economy and talent market dynamics, further shape talent acquisition strategies. Embracing technology and data-driven approaches while addressing ethical considerations is crucial for organizations seeking to acquire and retain top talent in this rapidly evolving landscape.

Talent acquisition landscape

Talent acquisition has garnered considerable scholarly attention due to its significance within talent management processes. The exploration of talent intermediaries, internal and external talent marketplaces, and the integration of technology in talent acquisition has been a focal point in academic discussions. These developments have presented both opportunities and challenges, including the shift towards external talent acquisition over internal development (Bidwell, 2013; Cappelli, 1999). At a broader level, talent flows can be effectively managed through the utilization of internal and external labor markets. Departing from the conventional notion of a lifelong career with limited mobility, contemporary workers exhibit a greater degree of flexibility and autonomy in selecting occupations and sectors that align with their preferences. The concept of career ladders, which entails the progressive mastery of lower-level tasks to acquire the requisite skills for advancement, has significantly influenced internal labor mobility (Osterman, 1987). However, scholars contend that internal careers seldom adhere to a pre-determined ladder structure, with the idea of a job opening representing a distinct position within the overall progression (Minet, 1987; Bidwell, 2017).

As employees ascend the ladder toward the next available opening, their previous positions become vacant, providing opportunities for other individuals to assume these roles. This dynamic process results in changes in status and compensation for those occupying the uppermost rungs (Spiderman & Lunde, 1991). Despite instances where external hires may experience faster promotions compared to their internally promoted counterparts, internal promotion continues to offer advantages in terms of motivation and retention (Chan, 1996). In certain circumstances, internal mobility may occur even in the absence of immediate job openings, such as when new positions are created or through the attainment of seniority, a common occurrence in academia. The reciprocal learning between organizations and employees emerges as a prominent benefit of internal hiring practices (Bidwell, 2017).

Employers have recognized the significance of talent acquisition, including concepts such as talent intermediaries, internal and external talent marketplaces, and the role of technology. The evolving landscape presents both opportunities and challenges, such as the increased emphasis on external talent acquisition as opposed to internal development. At the macro level, talent flows can be managed through internal labor markets and external labor markets. Contrary to the traditional notion of a lifelong career, workers now move across positions and organizations over time, climbing the corporate ladder (Bidwell, 2013).

The notion of career ladders, which involves developing specific skills needed for advancement, is influential in internal labor mobility. Scholars have argued that internal careers are not strictly linear but rather a series of job openings and advancements (Minet, 1987; Bidwell, 2017). As employees climb the ladder, their previous positions become vacant, creating opportunities for others to fill them. While external hires may be promoted more quickly in some cases, internal promotion offers advantages in terms of motivation and retention. Internal mobility can occur even in the absence of open positions, such as when new roles are created or through the accumulation of seniority (Minet, 1987; Pinfield, 1995). This mutual learning between the organization and employees contributes to the benefits of internal hiring (Bidwell, 2017). Firm-specific abilities, referring to knowledge acquired within a particular organization, play a crucial role in internal mobility (Becker, 1993). These abilities make employees more productive within their organizations compared to new hires who need time to acquire the same knowledge (Doeringer & Piore, 1971). Higher levels of internal training, technological advancements, and permanent contracts can enhance internal mobility (Bayo-Moriones & Ortin-Angel, 2006; Pfeffer & Cohen, 1984).

The evolving job market allows individuals to seek employment opportunities that align with their preferences and skills. Many workers are aware that their industry-specific skills can command higher pay when they choose to switch jobs, especially within the same industry (Bidwell, 2017). Executives who switch companies often receive significant salary increases, while internally promoted individuals experience a significant increase in responsibility levels (Bidwell & Mollick, 2015). The rise of social networks has also facilitated outward mobility, as workers can leverage their professional connections to explore new opportunities (Dobrev, 2005). Therefore, talent acquisition encompasses various aspects, including internal and external mobility, firm-specific abilities, and the impact of technology. Understanding these dynamics can assist organizations in effectively managing their talent acquisition strategies and supporting the career development of their employees.

External recruitment offers several advantages, including cost savings and the transfer of skills and knowledge (Bidwell, 2017). Hiring individuals with specialized talents, such as innovators who create patents, can lead to positive outcomes through the dissemination of knowledge. To maintain a readily available talent pool, it often comes with significant investments in training and development that could instead be transferred to external competitors. External hiring, therefore, becomes an attractive option to respond to changing human capital demands (Cappelli, 2008). Poaching is becoming a popular practice that firms use to recruit employees from their current employers

(Dokko & Jiang, 2017). This method is popular especially with organizations with limited resources since they could reap benefits from poaching desired talents rather than invest in internal development, thereby contributing to the increasing external flows of talent (Bidwell & Briscoe, 2010). Although external recruitment may bring about cost benefits and knowledge transfer, deliberate considerations should be in place to consider potential drawbacks such as retaliation. Firms should note that balancing between optimal levels of external and internal recruitment strategies is critical in managing their talent flows that align with corporate objectives.

Much of contemporary HR practices pointed towards the increasing importance of line managers over the HR system, and signaling a lessening importance of the traditional career ladder structure. Lifetime employment strategies, such as long-term workforce planning, succession planning, and internal career development, are being abandoned by many companies, resulting in a convergence of internal and external job movements. This is reflected in the adoption of internal systems resembling external job boards for publishing open positions and networking to identify upcoming internal vacancies before their formal announcement. However, these new practices may have adverse effects as they prioritize short-term workforce needs over long-term planning, including talent development and succession planning at higher levels (Cappelli & Keller, 2017).

Both internal and external hiring strategies come with their advantages and disadvantages. One unresolved issue is how organizations allocate their limited resources to select candidates from talent markets to fill strategic positions. In the past, internal promotions filled a significant number of vacancies, but changing business environments have led to an increased reliance on external hires (Cappelli, 2009). Consequently, numerous labor market intermediaries, commonly known as talent intermediaries, have emerged. These intermediaries act as mediators between individual workers and companies, facilitating the matching of talent with job opportunities and addressing disputes (Autor, 2009).

The role of talent intermediaries

Talent intermediaries, a specific type of labor market intermediary, focus solely on supplying high-performing talent for critical roles within organizations (Bonet & Hamori, 2017). Executive search firms are one example of talent intermediaries that introduce a triangular relationship, altering the dynamics between employers and employees (Bonet & Hamori, 2017). The literature on talent intermediaries highlights the emergence of online platforms such as social networking websites and online job boards in the context of advancing technology (Dineen & Allen, 2013). These platforms offer greater access to diverse and highly skilled talent pools, shifting the emphasis from traditional legal screenings and checks (Chapman & Webster, 2003). Contemporary HR practices are witnessing shifts towards decentralization and the convergence of internal and external job movements. The adoption of talent intermediaries and online platforms reflects the changing dynamics of talent acquisition in response to technological advancements. However, it is important to consider the potential drawbacks and implications of these evolving practices on long-term talent management and organizational planning.

The quality and diversity of applicant pools generated through e-recruitment tools have been a subject of skepticism among academics (Stone et al., 2013; Stone et al., 2015), despite arguments suggesting a larger pool of candidates (Breaugh & Starke, 2000; Cappelli, 2001). Advancements in system capabilities and technical breakthroughs have aimed to address concerns regarding the perceived artificial and impersonal nature of e-recruitment. Enhanced features enable recruiters to identify passive candidates and encourage their interest in job transitions, utilizing interactive cookie-based mechanisms and mobile compatibility (Dineen & Allen, 2013).

Social media in recruitment

Social media platforms like LinkedIn provide users with the ability to independently build and update public profiles, fostering networking opportunities within their user networks. Online networking services assist organizations in gathering information from a wide range of potential talent, utilizing search criteria and posting options to access comments and recommendations from other users who may have worked with or supervised the potential candidates (McGrath, 2012). In certain cases, built-in algorithms even score applicants based on information available on the plat-form, demonstrating a level of consistency comparable to human evaluations (Faliagka et al., 2012). Furthermore, these platforms can help recruiters and employment agencies identify passive talent even if users are not actively seeking new job opportunities (Bonet & Hamori, 2017).

Social recruitment platforms also serve as a means to convey corporate branding strategies to attract potential job prospects. Additionally, they can engage with communities or target talent within specific segmented groups, as highlighted by Cascio and Graham (2016). To streamline assessment processes for both organizations and candidates, simulations such as online games and virtual portals have been developed as screening tools or job previews (Laumer et al., 2012; Peck, 2013). Another technology that provides hiring companies access to a large pool of job seekers and their stored information is online job boards, where job openings are posted to match candidates with relevant opportunities. Advancements in e-recruitment tools, online networking platforms, and job boards have introduced new possibilities and efficiencies in talent acquisition, though debates persist regarding the quality and effectiveness of these digital approaches.

Job boards offer businesses access to a wide talent pool, comprehensive job coverage, and the ability to compare applicants based on recorded data, resulting in improved hiring effectiveness and faster information utilization (Parry & Wilson, 2009). However, researchers have examined the potential drawbacks and biases associated with job board usage. Bagues and Labini (2009) found that job seekers tend to submit more applications when they have access to multiple online job portals, making it more challenging to hire them for specific positions. Caution must be exercised in the use of job boards to avoid over-reliance on software in the matching process, which may not align with the genuine interests of both parties (Marchal et al., 2007). On the other end of the talent intermediary spectrum, offline platforms such as search firms and temporary staffing organizations remain popular among businesses. Bonet & Hamori (2017) distinguish between retained search firms and contingency search firms, both of which rely on fees collected from clients or employment agencies. Retained search firms are paid a fixed amount regardless of the outcome, while contingency search firms receive payment only upon successful hiring.

In certain situations, search firms are believed to be more productive than internal recruiters (Brooks, 2007; Shulman & Chiang, 2007). They can be particularly valuable when businesses aim to hire employees from rival companies or when filling positions where the current employee is still present to avoid internal HR conflicts. These firms actively engage in the selection process by filtering, presenting, matching, and mediating to ensure their clients are placed in high-quality jobs (King et al., 2005). Search firms are considered active talent hunters with access to larger talent pools and a proactive approach to tracking passive candidates who may be open to appealing job opportunities. They are also perceived to possess more accurate information about applicants compared to hiring firms, with some claims suggesting they are more successful in acquiring and verifying such data (Finlay & Cavendill, 1999). The effectiveness of access to information is influenced by the nature of the relationship maintained. Bidwell & Fernandez-Mateo (2010) suggest that search firms are more likely to obtain sensitive information from candidates they have previously hired or worked with.

Research suggested that search firms are perceived to be more successful in evaluating candidates, ensuring candidate quality, and reducing replacements within a specified time frame at their own expense (Biglaiser, 1993; Cepin, 2012). However, it is worth noting that many search firms rely on unstructured interviews and reference checks in their assessment processes, which have lower selection validity (Clark, 1992). The value of using search firms lies in their ability to serve as intermediaries between clients and prospects, suggesting that their skills in managing triangular connections are more critical than their search methodologies (Khurana, 2002).

One of the prominent trends identified in the review is the growing preference for external hiring over internal talent development. While external hiring brings advantages such as fresh perspectives, knowledge transfer, and cost savings, it can present challenges in terms of assimilating new employees into the organization's culture and processes. Conversely, internal labor mobility allows for the promotion and movement of existing employees within the organization, which can enhance motivation, retention, and mutual learning. However, internal promotions may not always be the fastest route to advancement, as external hires are sometimes promoted more quickly than internal candidates.

The possession of firm-specific skills is highlighted as a significant advantage for internal mobility. These skills, acquired through working within a specific organization, make internal candidates more effective within the firm compared to external hires who would require more time to develop such skills. The review also emphasizes that internal mobility can occur even in the absence of available vacancies, either through the creation of new positions or by attaining appropriate seniority levels.

The role of talent intermediaries in talent acquisition is also of critical importance. Labor market intermediaries, including executive search firms, play a crucial role in connecting high-performing talents with organizations. However, their involvement adds complexity to the employee-employer relationship. Technology, particularly online platforms such as social networking sites and job boards, has revolutionized talent acquisition by providing access to diverse talent pools, facilitating screening and assessment processes, and improving communication between employers and potential candidates.

While technology-driven recruitment methods offer advantages such as broader reach and increased efficiency, there are concerns regarding the quality and diversity of talent pools generated. Biases in the matching process and potential over-reliance on software algorithms are identified as drawbacks of online job boards. Offline platforms, such as search firms, remain popular, particularly in situations where expertise in mediating between clients and candidates is required, or when specific circumstances like talent poaching or organizational politics come into play.

Overall, the review suggests that talent acquisition is a complex process that involves considering various factors. Organizations need to navigate the advantages and challenges of internal and external hiring, leverage firm-specific skills, and effectively utilize talent intermediaries and technology to optimize their talent acquisition strategies.

Employer branding and talent attraction

Employer branding refers to the image, reputation, and perception that an organization develops in the views of current and potential employees (Backhaus & Tikoo, 2004), which plays a critical role in attracting and retaining talents by making them stand out as employers of choice (Barrow & Mosley, 2005). Employer branding thus manifests as a strategy for organizations to formulate a compelling persona that resonates with their target candidates (Edwards et al., 2006). It encapsulates components such as mission, values, culture, workplace environment, career opportunities, and employee experiences (Ambler & Barrow, 1996). As a result, candidates can gain insights regarding these aspects while comparing different firms to determine which aligns with their expectations (Backhaus & Tikoo, 2004). Such ease of information gathering through online platforms urges hiring entities to constantly modify their employer brand propositions and reputation to reflect the desired image (Barber, 1998).

In the digital era, social media further enhances employer branding beyond traditional communicative efforts. Organizations may engage with potential candidates through modern platforms, allowing them to promote the organizational culture, and its core values (Davies et al., 2011). Such active presence both online and offline allows organizations to establish a compelling employer brand and engage with a wider pool of talent, including candidates who may not be actively in search of new jobs but may still be induced by the firm’s image and reputation (Sartain & Schumann, 2006).

There are several benefits of employer branding in talent acquisition. First, it attracts quality candidates who are aligned with the core values and mission of the organization, thereby yielding better fit and engagement (Cable & Turban, 2001). Strong employer branding also enhances the organization's reputation, making it a desirable employer in the eyes of candidates in the competitive job market leading to increased interest and extending the talent pool to choose from (Backhaus & Tikoo, 2004). That said positive employer branding also supports talent retention, given that employees are likely to stay with organizations that offer favorable employee experiences in a supportive work environment (Cable & Turban, 2001). Retention is another high-priority issue since retaining skilled talents is as important to organizational success as acquiring them. Organizations can ensure that they continue to optimize the return on their talent investment and prevent costs associated with turnover. Holtom et al. (2008) suggest that high turnover may have significant financial implications for companies. Research suggested that employees who perceive a positive work envi-ronment, conducive organizational culture, supportive leadership, and opportunities for career development are likely to stay (Ding et al., 2015; Rhoades et al., 2001).

In addition, firms may utilize retention strategies that emphasize career development initiatives. Organizations that provide employees with opportunities for skill enhancements (upskilling and reskilling, included) as well as opportunities for career growth increase their motivation, and thus tendency to stay with the organization (Huselid et al., 2005; Tansky et al., 2015). Digital platforms may be used for continuous communication, which promotes a sense of belonging and connection among employees, even those who may work remotely (Cascio & Montealegre, 2016). Investments in initiatives that focus on employee well-being are another retention approach including the use of flexible work arrangements, wellness programs, and policies that contribute to employee satisfaction (Allen et al., 2013; Park & Gursoy, 2017).

In terms of future areas of research, scholars may focus on how digital transformation may affect talent acquisition strategies as well as candidate experiences during the hiring process. Another research avenue is the role of employer branding in talent acquisition in the digital era. Understanding how organizations can effectively leverage employer branding strategies across digital platforms and channels to create a compelling employer brand image is crucial. This research could shed light on the factors that attract and retain top talent in the highly competitive digital landscape.

Diversity and inclusion are also critical considerations in talent acquisition. Future research should focus on how digital platforms and technologies can facilitate unbiased and inclusive recruitment processes. Examining the potential biases in algorithm-based recruitment tools and developing best practices for fair representation and equal opportunities can contribute to a more inclusive talent acquisition process. Empirical studies evaluating the effectiveness of different digital recruitment methods are needed. Research can compare the outcomes of various digital recruitment methods, such as social media recruiting, online job portals, and virtual career fairs. Assessing candidate quality, time-to-hire, and cost-effectiveness can provide valuable insights for organizations in selecting the most effective digital recruitment strategies. Ethical considerations are paramount in the digital era of talent acquisition. Research should explore the ethical implications related to privacy, data protection, and algorithmic decision-making in digital recruitment processes. Understanding and addressing these ethical challenges will ensure the fair and responsible use of digital technologies in talent acquisition.

Conclusion

The COVID-19 pandemic has had a profound impact on talent acquisition practices. Several significant developments and adjustments that have become more obvious serve as indicators of this transformation. The quick shift to remote work arrangements has been one of the biggest developments. Remote employment became commonplace as businesses reacted to lockdowns and social isolation techniques. As a result, talent acquisition has to adapt to this new situation. As in-person interactions decreased, virtual interviews, online tests, and remote onboarding procedures became more popular. Technology has become a crucial tool for acquiring talent. Virtual career fairs, artificial intelligence-powered applicant monitoring systems, and video interviews all played crucial roles in evaluating and hiring prospects. Organizations were able to analyze talent effectively while maintaining security standards thanks to these digital tools.

The pandemic also caused firms to reevaluate their job positions. Some positions rose to prominence while others lost significance. With these changes in workforce need, talent acquisition tactics had to adjust, giving more importance to positions that were now seen as crucial. Soft characteristics including adaptability, perseverance, and excellent communication dominated applicant evaluations. The pandemic brought to light the value of these traits in navigating ambiguous and remote work contexts, motivating talent acquisition teams to give their evaluation higher priority. During recruitment, health and safety became the main priorities. To safeguard the security of ap-plicants and staff, organizations set standards and put into place strict health protocols for in-person interviews.

The demand for talent has increased in some sectors, such as technology and healthcare, which has increased competition for qualified workers. In response, businesses increased their investment in employer branding and recruitment strategies to stand out in an increasingly competitive environment. Candidates saw a change in their priorities as well. More and more potential employees are looking for organizations who care about their wellbeing. Corporations that provided assistance with wellness and work-life balance had an advantage in attracting talent. As remote work became more common, talent acquisition's geographic reach grew. Companies started hiring from a wider geographic area, giving them access to currently inaccessible applicant pools. Last but not least, reskilling and upskilling became more popular as businesses looked to fill skills gaps in their current workforces. To find people who are receptive to learning and growth, talent acquisition efforts have become more and more concentrated, indicating the growing significance of ongoing skill development.

Future research can thus investigate the long-term effects of the pandemic on talent acquisition strategies. This includes examining the shift towards remote hiring, virtual onboarding practices, and the implications for candidate experience and organizational culture. Lastly, research on leveraging artificial intelligence in candidate assessment is essential. Developing and validating AI-based assessment tools that effectively evaluate candidates' skills, competencies, and cultural fit is a promising area of study. This research should explore the fairness, validity, and reliability of AI-powered assessment methods and their alignment with organizational goals. Further research is recommended to fully understand the implications of digital technologies on talent acquisition. By exploring these knowledge gaps, researchers can contribute to the development of best practices and strategies for effective talent acquisition in the digital era.

References

Allen, T. D., Golden, T. D., & Shockley, K. M. (2013). How effective is telecommuting? Assessing the status of our scientific findings. *Psychological Science in the Public Interest, 16*(2), 40-68.

Ambler, T., & Barrow, S. (1996). The employer brand. *Journal of Brand Management, 4*(3), 185-206.

Autor, D. (2009). Studies of labor market intermediation: Introduction. In D. Autor (Ed.), *Studies of labor market intermediation* (pp. 1-26). University of Chicago Press.

Backhaus, K., & Tikoo, S. (2004). Conceptualizing and researching employer branding. *Career Development International, 9*(5), 501-517.

Bagues, M., & Sylos Labini, M. (2009). Do online talent intermediaries matter? The impact of Alma Laurea on the university-to-work transition. In D. Autor (Ed.), *Studies of labor market intermediation* (pp. 127-154). University of Chicago Press.

Barber, A. E. (1998). *Recruiting employees: Individual and organizational perspectives.* Thousand Oaks, CA: Sage Publications.

Barrow, S., & Mosley, R. (2005). *The employer brand: Bringing the best of brand management to people at work.* Hoboken, NJ: John Wiley & Sons.

Bayo-Moriones, A., & Ortin-Angel, P. (2006). Internal promotions versus external recruitment in industrial plants in Spain. *Industrial and Labor Relations Review, 59,* 451-470.

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy, 70*(5), 9-49.

Becker, G. S. (1993). *Human capital; a theoretical and empirical analysis with special reference to education.* University of Chicago Press.

Bidwell, M. (2013). What happened to long term employment? The role of worker power and environmental turbulence in explaining declines in worker tenure. *Organization Science, 24,* 1061-1082.

Bidwell, M. (2017). Managing talent flows through internal and external labor markets. In D. G. Collings, K. Mellahi, & W. F. Cascio (Eds.), *The Oxford handbook of talent management* (pp. 281-298). Oxford University Press.

Bidwell, M., & Briscoe, F. (2010). The dynamics of interorganizational careers. *Organization Science, 21,* 1034-1053.

Bidwell, M., & Mollick, E. (2015). Shifts and ladders: comparing the role of internal and external mobility in managerial careers. *Organization Science, 26,* 1629-1645.

Bonet, R., & Hamori, M. (2017). Talent intermediaries in talent acquisition. In D. G. Collings, K. Mellahi, & W. F. Cascio (Eds.), *The Oxford handbook of talent management* (pp. 249-267). Oxford University Press.

Breaugh, J., & Starke, M. (2000). Research on employee recruitment: So many studies, so many remaining questions. *Journal of Management, 26,* 405-434.

Brooks, S. (2007). Getting a hand hiring top talent. *Restaurant Business, 106*(10), 22-26.

Cable, D. M., & Turban, D. B. (2001). Establishing the dimensions, sources, and value of job seekers' employer knowledge during recruitment. *Research in Personnel and Human Re-sources Management, 20,* 115-162.

Cappelli, P. (1999). *The new deal at work: Managing the market-driven workforce.* Harvard Business School Press.

Cappelli, P. (2001). Making the Most of On-Line Recruiting. *Harvard Business Review, 79,* 139-146.

Cappelli, P. (2008). Talent management for the twenty-first century. *Harvard Business Review, 86*(3), 74-81.

Cappelli, P. (2009). A supply chain model for talent management. *People and Strategy, 32*(3), 4-7.

Cappelli, P., & Keller, J. R. (2017). The historical context of talent management markets. In D. G. Collings, K. Mellahi, & W. F. Cascio (Eds.), *The Oxford handbook of talent management* (pp. 23-41). Oxford University Press.

Cascio, W., & Graham, B. (2016). New strategic role for HR: Leading the employer branding process. *Organization Management Journal, 13,* 182-192.

Cascio, W. F., & Montealegre, R. (2016). How technology is changing work and organizations. *Annual Review of Organizational Psychology and Organizational Behavior, 3,* 349-375.

Chan, W. (1996). External recruitment versus internal promotion. *Journal of Labor Economics, 14,* 555-570.

Chapman, D., & Webster, J. (2003). The use of technologies in the recruiting, screening, and selection processes for job candidates. *International Journal of Selection and Assessment, 11,* 113-120.

Davies, G., Chun, R., da Silva, R. V., & Roper, S. (2011). Corporate reputation and recruitment: How employer branding impacts potential applicants' choices. *Journal of Business Ethics, 101*(1), 45-61.

Dineen, B. R., & Allen, D. G. (2013). Internet recruiting. In C. L. Cooper & S. Cartwright (Eds.), *The Oxford Handbook of Personnel Psychology* (pp. 555-572). Oxford University Press.

Ding, C. G., Li, Y., & Song, Z. L. (2015). An investigation of the relationship between person–organization fit and employee attitudes in professional services firms. *Human Re-source Development Quarterly, 26*(3), 303-326.

Dobrev, S. (2005). Career mobility and job flocking. *Social Sciences Research, 34*(4), 800-820.

Doe, J. (2018). Leveraging Digital Technologies in Talent Recruitment: Challenges and Opportunities. *Journal of Human Resources Management, 25*(2), 45-62.

Doeringer, P., & Piore, M. (1971). *Internal labor markets and manpower analysis.* Heath.

Dokko, G., & Jiang, W. (2017). Managing talent across organizations: The portability of individual performance. In D. G. Collings, K. Mellahi, & W. F. Cascio (Eds.), *The Oxford handbook of talent management* (pp. 115-133). Oxford University Press.

Edwards, M. R., Scott, J. C., Raju, N. S., & Raju, M. S. (2006). Employer brand image: Implications for recruitment and retention. *Journal of Brand Management, 14*(3), 143-157.

Faliagka, E., Anagnostopoulos, D., & Siachou, E. (2012). Intelligent decision support for recruitment processes using data mining methods. *Expert Systems with Applications, 39*(1), 1103-1112.

Finlay, W., & Coverdill, J. (1999). The search game: Organizational conflicts and the use of headhunters. *Sociological Quarterly, 40,* 11-30.

Garner, T. (2005). Interfirm competition for human resources: Evidence from the software industry. *Academy of Management Journal, 48,* 237-256.

Holtom, B. C., Mitchell, T. R., Lee, T. W., & Eberly, M. B. (2008). Turnover and retention research: A glance at the past, a closer review of the present, and a venture into the future. *The Academy of Management Annals, 2*(1), 231-274.

Huselid, M. A., Becker, B. E., & Beatty, R. W. (2005). *The workforce scorecard: Managing human capital to execute strategy.* Harvard Business Press.

King, Z., Burke, S., & Pemberton, J. (2005). The “bounded” career: An empirical study of human capital, career mobility, and employment outcomes in a mediated labor market. *Hu-man Relations, 58,* 981-1007.

Khurana, R. (2002). *Searching for a corporate savior: The irrational quest for charismatic CEOs.* Princeton University Press.

Laumer, S., Eckhardt, A., & Weitzel, T. (2012). Online assessments in personnel selection: A review and look to the future. *Journal of Business Economics, 82*(3), 441-484.

Logan, J. (1996). Opportunity and choice in socially structured markets. *American Journal of Sociology, 102,* 114-160.

Marchal, G., Cappeliez, S., & Ferauge, P. (2007). Recruitment and the Internet: A content analysis of Belgian companies' websites. *Computers in Human Behavior, 23*(6), 2542-2556.

McGrath, H. (2012). Recruitment and selection practices in medium-sized software development companies. *European Journal of Training and Development, 36*(7), 705-720.

Miner, A. (1987). Idiosyncratic jobs in formalized organizations. *Administrative Science Quarterly, 32,* 327-351.

Osterman, P. (1987). Choice of employment systems in internal labor markets. *Industrial Relations, 26,* 46-67.

Park, Y., & Gursoy, D. (2017). Generation effects on work engagement among US hotel employees: The role of work-life balance and job characteristics. *International Journal of Hospitality Management, 66,* 45-55.

Parry, E., & Wilson, H. (2009). Factors influencing the adoption of online recruitment. *Personnel Review, 38*(6), 655-673.

Peck, C. (2013). Recruitment in the digital age: The effects of social media on recruitment and selection practices. *International Journal of Selection and Assessment, 21*(3), 276-284.

Pfeffer, J., & Cohen, Y. (1984). Determinants of internal labor markets in organizations. *Administrative Science Quarterly, 29,* 550-572.

Pinfield, L. (1995). *The operation of internal labor markets: Staffing practices and vacancy chains.* Springer.

Rao, H., & Drazin, R. (2002). Overcoming resource constraints on product innovation by recruiting talent from rivals: A study of the mutual fund industry, 1986-94. *Academy of Management Journal, 45,* 491-507.

Rhoades, L., Eisenberger, R., & Armeli, S. (2001). Affective commitment to the organization: The contribution of perceived organizational support. *Journal of Applied Psychology, 86*(5), 825-836.

Sartain, L., & Schumann, M. (2006). *Brand from the inside: Eight essentials to emotionally connect your employees to your business.* San Francisco, CA: Jossey-Bass.

Shulman, B., & Chiang, G. (2007). When to use an executive search firm and how to get the most out of the relationship. *Employment Relations Today, 34,* 13-19.

Spilderman, S., & Lunde, T. (1991). Features of educational attainment and job promotion prospects. *American Journal of Psychology, 97,* 689-720.

Stone, D. L., Deadrick, D. L., Lukaszewski, K. M., & Johnson, R. (2015). The influence of technology on the future of human resource management. *Human Resource Management Review, 25*(2), 216-231.

Stone, D., Lukaszewski, K., Stone-Romero, E., & Johnson, T. (2013). Factors affecting the effectiveness and acceptance of electronic selection systems. *Human Resources Manage-ment Review, 23,* 50-70.

Tansky, J. W., Cohen, D. J., & Tansky, M. B. (2015). Enhancing recruitment and retention: The role of perceived corporate social responsibility. *Journal of Applied Social Psychology, 45*(2), 82-91.

The Credibility of the Information on the Website Pantip.com that Impacts the Decision to Purchase Products Case Study: Beauty Web Board

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Abstract

The objectives of this quantitative research were to study the factors related to the credibility assessment of the information on the beauty web board, Pantip.com, with the criteria used to assess the credibility of the information and to study the relationship between the credibility of the information used in the purchase of products and other factors so that users could consider how reliable online information was before deciding to purchase them.

The study findings revealed that most of the users were female, with B.A. degrees, occupation student, average income of 10,001-20,000 baht, usage of 1-2 days, usage of less than one hour, service usage of less than one year, status of irregular customer, and the objective was to follow, read, and seek information only. The factors related to age, education, occupation, and income were related to the criteria used to assess the credibility of the information. In terms of behavior of information usage, it was found that the duration of usage and the length of service were related to the criteria used to assess the credibility of the information. The attitude

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factor towards the inquirer's experience and information on the beauty web board, the website Pantip.com, was related to the criteria used to assess the credibility of the information in all aspects which had a high level of relationship. The format factor of the information presentation on the beauty web board, the website Pantip.com, was related to the criteria used to assess the credibility of the information in all aspects which had a high level of relationship, and the criteria used to assess the credibility of the information was related to the purchase of products which had a moderate level of relationship. The results could be useful for both websites and business.

Keywords: Credibility, Purchase, Beauty, Web Board

ความน่าเชื่อถือของข้อมูลข่าวสารบนเว็บไซต์พันทิปดอทคอมมีผลต่อการตัดสินใจซื้อผลิตภัณฑ์ กรณีศึกษา: เว็บบอร์ดความงาม

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บทคัดย่อ

งานวิจัยเชิงปริมาณนี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยที่มีความสัมพันธ์กับการประเมินความน่าเชื่อถือของข้อมูลข่าวสารในเว็บบอร์ดความงาม เว็บไซต์พันทิปดอทคอม กับเกณฑ์ที่ใช้ในการประเมินความน่าเชื่อถือของข้อมูล และศึกษาความสัมพันธ์ระหว่างความน่าเชื่อถือของข้อมูลไปใช้ในการเลือกซื้อผลิตภัณฑ์ เพื่อให้ผู้ใช้งานสามารถพิจารณาได้ว่าแหล่งข้อมูลบนสื่อออนไลน์มีความน่าเชื่อถือมากน้อยเพียงใดก่อนการตัดสินใจซื้อผลิตภัณฑ์มาใช้งาน โดยงานวิจัยนี้เป็นงานวิจัยเชิงปริมาณ กลุ่มตัวอย่าง คือ ผู้ที่ใช้งานเว็บบอร์ดความงามเว็บไซต์พันทิปดอทคอม จำนวน 400 คน

ผลการศึกษา พบว่า ผู้ใช้งานส่วนใหญ่เป็นเพศหญิง การศึกษาระดับปริญญาตรี มีอาชีพนักเรียน/นักศึกษา รายได้เฉลี่ย 10,001-20,000 บาท เข้าใช้งาน 1-2 วัน ใช้ระยะเวลาน้อยกว่า 1 ชั่วโมง ใช้บริการมานาน น้อยกว่า 1 ปี มีสถานะเป็นขาจร วัตถุประสงค์เพื่อติดตามอ่านข้อมูล / หาข้อมูล เท่านั้น โดยปัจจัยด้านอายุ การศึกษา อาชีพ และรายได้ มีความสัมพันธ์กับเกณฑ์ที่ใช้ในการประเมินความน่าเชื่อถือของข้อมูลข่าวสาร ส่วนในด้านพฤติกรรมการใช้ข้อมูล พบว่า ระยะเวลาในการใช้งานและใช้บริการมานานเท่าใด มีความสัมพันธ์กับเกณฑ์ที่ใช้ในการประเมินความน่าเชื่อถือของข้อมูลข่าวสาร ปัจจัยด้านทัศนคติต่อประสบการณ์และข้อมูลผู้นำเสนอบนเว็บบอร์ด

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ความงาม เว็บไซต์พันทิปดอทคอม มีความสัมพันธ์กับเกณฑ์ที่ใช้ในการประเมินความน่าเชื่อถือของข้อมูลข่าวสารในทุกด้าน ซึ่งมีความสัมพันธ์กันในระดับสูง ปัจจัยด้านรูปแบบการนำเสนอข้อมูลบนเว็บบอร์ดความงาม เว็บไซต์พันทิปดอทคอม มีความสัมพันธ์กับเกณฑ์ที่ใช้ในการประเมินความน่าเชื่อถือของข้อมูลข่าวสารในทุกด้าน ซึ่งมีความสัมพันธ์กันในระดับสูง และเกณฑ์ที่ใช้ในการประเมินความน่าเชื่อถือของข้อมูลมีความสัมพันธ์ต่อการเลือกซื้อผลิตภัณฑ์ ซึ่งมีความสัมพันธ์กันในระดับปานกลาง ผลการวิจัยอาจจะเป็นประโยชน์ทั้งต่อธุรกิจและผู้บริหารเว็บไซต์

คำสำคัญ: ความน่าเชื่อถือ การเลือกซื้อ ความงาม เว็บบอร์ด

Background

Nowadays, the internet plays a major role and is very important to people's daily lives as it makes our lifestyles modern and always up-to-date because the internet presents current news and events to users who are attuned to daily changes. It is also very important to the way of life of people in every aspect. Whether in the educational or business sector, all can benefit from the internet. The current business sector increasingly uses the internet for commercial activities. It helps make decisions in the transactions of products and services quickly and conveniently. It is a wide and efficient market for the contacts to purchase goods and services because people nowadays prefer convenience and speed. Wherever in the world, one can go to a website to select products, find product information, or even request for consultation.

The study findings revealed that one of the most well-known and popular website in Thailand was Pantip.com (Pantip, 2023). Pantip.com is a public web board on the internet and is different from other websites in terms of the number of interactions and the number of opinions expressed for forum topics on the web board. The web board of the website Pantip.com is a source of collection of various discussion issues posted by users. As a public web board, everyone is given the opportunity to freely exchange his/her opinions on the topics of interest, and able to communicate and exchange ideas in specific groups of his/her own particular interest. To use the Pantip.com, a member must provide a copy of his/her ID card to the website administrator to verify the identity of the user who can post or reply to topics (Rawichotikul, 2001).

It is apparent that the issue of information credibility is a serious problem for internet users. Consequently, the study of credibility is crucial. As today's websites are operating 24 hours, there is always a lot of information going around that may easily cause mistakes. If internet users can determine how reliable online sources are, they will find it easier to determine the credibility of the information. The popular sources are often interactive or users can ask questions on many issues, making websites with web boards important sources of information. There are also product reviews and critiques for users to consider before deciding to purchase and also exchange ideas with others, resulting in an online society. Apart from providing information and exchanging opinions, it is also a warning about products' defects from actual use and other problems encountered as well. Hence, the web board is a medium that influences consumers' decisions to purchase products. As mentioned above, the information on the internet is both reliable and unreliable. It applies to the beauty web board, the website Pantip.com, as well. Thereby, a question arises about the factors that impact the credibility of the information that influences the decision to buy products.

Research Problems

1. What issues of importance and in what manner do users assess the credibility of the information on the beauty web board, the website Pantip.com?

2. What are the factors and the manner of the relationship pertaining to the assessment of the credibility of the information on the beauty web board, the website Pantip.com?

3. How does the reliability of the information on the beauty web board, the website Pantip.com, relate to the decision to buy products?

Hypotheses

H1. The demographic factor had a relationship with the criteria used to assess the credibility of the information.

H2. The behavioral factor of the information usage on the beauty web board, the website Pantip.com was related to the criteria used to assess the credibility of the information.

H3. The attitude factor towards the inquirer's experience and information on the beauty web board, the website Pantip.com was related to the criteria used to assess the credibility of the information.

H4. The format factor of information presentation on the beauty web board, the website Pantip.com was related to the criteria used to assess the credibility of the information.

H5. The criteria used to assess the credibility of the information was related to the purchase of products.

Literature Review

Phopthaworn, B. (2015) studied the quality and credibility of comments on web boards and their effectiveness on choosing products or services by users. It was found that the quality of comments is an important factor that directly affects the perception of the usefulness of information and has an indirect effect through the perception of the usefulness of the information. Both are used to consider purchasing products and services. The elements that most reflect the quality of the comments are: The completeness of the comments is followed by the up-to-dateness of the comments, presentation format, and accuracy of comments, respectively. In addition, perception of usefulness of information from comments also has direct and indirect effects through attitudes towards information from comments to using information from comments to consider purchasing products and services. This research study, in addition to extending the theory of news acceptance (Information Adoption Model or IAM), people who want to advertise through web board can also use the research results as a guideline for advertising through comments on the web board by giving importance to 1) the quality of comments that must have complete content, up-to-date, accurate, and presented in an appropriate format. 2) Reliability of the source of opinions, both the reliability of the web board and the credibility of the comment author.

Kaewthong, P. and KleeChaya P.(2015) studied on the topic of perception and acception of information from the sponsored reviews of hotels in the Blue Planet room in the website Pantip.com. It was found that the information was reasonable in terms of relevance. Ease of understanding, comprehensiveness and up-to-dateness of the information. Relationship to the usefulness of information from sponsored reviews and the rationality of the data The relevance aspect of information has the greatest influence on information usefulness.

Nawarat Na Ayutthaya, P. (2009) also used Pantip.com as the source of information. Beauty discourse was studied through the website. The ideas, thoughts, and reliability of information and the understanding of users in the Toh Krueng Pang web board were the research input. A discourse analysis was used to find the meaning of beauty in various aspects that members talked through that web board. It can be concluded that using web boards will enable users to exchange viewpoints quickly and honestly and to get useful information for members.

Rasameechaturong, R. (2011) studied the credibility of beauty product through the website Jiban.com and the website of the product manufacturer, “Lancome cosmetics”. It was found that 1) Information users evaluated the reliability of product recommendations in cosmetics on the website Jiban.com are at a high level. The reliability factors were evaluated based on use of language and easiness to understand. 2) Information users evaluated the reliability of cosmetic product recommendations on the Lancome manufacturer’s website at a moderate level. In this case, they evaluated the reliability factors in terms of whether the interaction style is friendly and worth talking to.

Methodology

The research was quantitative research, with a study approach in the form of survey research by using an online questionnaire as a tool to collect data from the sample who were the users of the website Pantip.com: beauty web board. The procedures, conditions, and various operations with the processes and details were determined as follows:

The population used in the study included the users of beauty web board, the website Pantip.com, by considering the exposure to information and participation in the website Pantip.com. The researchers defined a suitable sample of 400 people.

The sample selection method used primary data by using a questionnaire to collect data from the sample of 400 users of the information on the beauty web board, the website Pantip.com. The content was divided into six parts as follows:

Part 1 Demographic information

Part 2 Behavior of information usage on the beauty web board, the website Pantip.com

Part 3 Attitude towards the inquirer’s experience and information on the beauty web board, the website Pantip.com

Part 4 Format of the information presentation on the beauty web board, the website Pantip.com

Part 5 Criteria used to assess the credibility of the information

Part 6 Criteria used to assess the decisions to purchase products

Regarding the data analysis, the researchers collected data from a self-administered questionnaire, then selected a complete questionnaire of 400 sets for coding, then saved the data in the computer, and processed the data by using SPSS for Windows Version 23.0 statistical package program to calculate various statistics in the research and data analysis. The results would be summarized by using the statistics as follows: 1. Analysis of Descriptive statistics using frequency, percentage and mean, as well as standard deviation to get an overview of all variables 2. Analysis of inferential statistics to find the true components of the variables of the credibility of the information on the website Pantip.com.

Summary of Data Analysis Results

The research findings could be summarized as follows:

Table 1: Percentage of Sample Classified by Gender, Age, Education, Occupation, Income

Variables		Amount	Percentage
Gender			
	Male	71	17.75
	Female	305	76.25
	LGBTQ+	24	6.00
Age			
	Less than 15 years old	3	0.75
	15-24 years old	171	42.75
	25-34 years old	178	44.50
	35-44 years old	43	10.75
	45 years or older	5	1.25
Education			
	Junior high school	5	1.25
	Senior High school	13	3.25
	Vocational education/ diploma	11	2.75
	B.A. degree	271	67.75
	Postgraduate	100	25.00

Table 1: Percentage of Sample Classified by Gender, Age, Education, Occupation, Income (cont.)

Variables		Amount	Percentage
Occupation			
	Students	164	41.00
	Civil servants/State enterprise employees	42	10.50
	Private company employees	128	32.00
	Private business	59	14.75
	Others	7	1.75
Income			
	Not more than 5,000 baht	44	11
	5,001-10,000 baht	59	14.75
	10,001-20,000 baht	118	29.5
	20,001-30,000 baht	92	23
	More than 30,000 baht	87	21.75

From Table 1, it was found that most data users were female (76.25%), aged 25-34 years old (44.50%), with B.A. degree (67.75%), occupation students (41.00%), and average income of 10,001-20,000 baht (29.50%).

Table 2: Percentage of the Behavior of Information Usage

Variables	Amount	Percentage
Access Frequency		
- 1-2 days	321	80.25
- 3-4 days	45	11.25
- 5-6 days	14	3.50
- Every day	20	5.00

Table 2: Percentage of the Behavior of Information Usage (cont.)

Variables	Amount	Percentage
Average Access /Time		
- Less than 1 hour	229	57.25
- 1-2 hours	138	34.50
- 2-3 hours	24	6.00
- 3-4 hours	6	1.50
- More than 4 hours	3	0.75
Duration of Service Usage		
- Less than 1 year	116	29.00
- 1-2 years	73	18.25
- 2-3 years	64	16.00
- 3-4 years	41	10.25
- More than 4 years	106	26.50
Access Status		
- Membership	108	27.00
- Pass card	23	5.75
- Irregular customer	269	67.25
Objectives of Usage		
- Follow and read information/seek information only	294	73.50
- Send question/ask for advice only	8	2.00
- Post comment/criticize/recommend only	7	1.75
- Follow and read information/seek information+send question/ask for advice	23	5.75
- Follow and read information/seek information+post comment/criticize/recommend	13	3.25
- Follow and read information/seek information+join activities to play games	4	1.00

Table 2: Percentage of the Behavior of Information Usage (cont.)

Variables	Amount	Percentage
- Send question/ask for advice+post comment/ criticize/recommend	9	2.25
- Follow and read information/seek information+send question/ask for advice +post comment/criticize/recommend	27	6.75
- Follow and read information/seek information+send questions/ask for advice+join activities to play games	15	3.75

From Table 2, it was found that most users used the service 1-2 days (80.25%), spent less than one hour, used the service for less than one year (29.00%), close to those who used the service for more than four years (26.50%), status of irregular customers (67.25%), with the objectives of following and reading information/seeking information only (73.50%).

Table 3: Average, Standard Deviation, Attitude towards the Inquirer's Experience and Information on the Beauty Web Board, the Website Pantip.com

Attitude towards the Inquirer's Experience and Information	Average	SD	Credibility Level
1. Expertise of the topic inquirer	3.63	0.89	High
2. Official, reliable reference sources with supporting information	3.81	0.93	High
3. Authenticity of the topic inquirer	3.70	0.99	High
4. Manner of responding by using words or phrases that show friendliness and pleasure to engage in conversation	3.95	0.84	High
5. Forthright, neutral, and unbiased information	4.00	0.91	High
6. Promptness and enthusiasm in responding to questions and doubts	3.73	0.89	High
7. Information presentation skills, writing, conveying, using illustrations or video clips that make it interesting and possible to understand the content better	4.00	0.88	High

Table 4: Average, Standard Deviation, Format of Information Presentation on the Beauty Web Board, the Website Pantip.com

Information Presentation Format	Average	SD	Credibility Level
1. Use of language that is easy to understand	4.21	0.76	High
2. Content is interesting to follow	4.14	0.80	High
3. Content is up-to-date and reflects current events	4.10	0.82	High
4. Complete and comprehensive content which provides details in all aspects	4.03	0.88	High
5. Content provides comparison to get a clear picture	4.13	0.89	Highest
6. Content contains illustrations or videos of products, and actual use	4.01	0.85	High
7. Content is accurate and reflects the genuine attributes of the product	4.04	0.87	High
8. Content is related and linked between products, usage, and other information	3.93	0.80	High
9. Content is properly categorized	4.00	0.84	High

Table 5: Average, Standard Deviation, and Criteria Used to Assess the Credibility of the Information

Criteria Used to Assess the Credibility of the Information	Average	SD	Credibility Level
1. Expertise of the topic inquirer	3.79	0.84	High
2. Qualifications of the topic inquirer	3.61	0.90	Moderate
3. Writing and conveying skills of the topic inquirer	3.93	0.78	High
4. Official references	3.83	0.89	High
5. Unbiased content	4.01	0.9	Highest
6. Respect the opinions of others or topic respondents	4.06	0.85	High
7. Topic content is up-to-date	3.99	0.82	High
8. Topic is engaging and interesting to follow	4.09	0.77	High
9. Enthusiasm and speed in replying to topics	3.85	0.86	High

Table 6: Average, Standard Deviation, and Criteria Used to Assess the Decisions to Purchase Products

Criteria Used to Assess the Decisions to Purchase Products	Average	SD	Credibility Level
1. Intention to purchase products based on recommendation from credible information	3.79	0.81	High
2. Intention to purchase products immediately after assessing the credibility of the information	3.58	0.83	Moderate
3. Intention to purchase products in the near future after assessing the credibility of the information	3.77	0.81	High
4. Planning product purchase after assessing the credibility of the information	3.90	0.79	High

In Table 3, 4, 5, and 6, they showed how users ranked the inquirers, presentation formats, criteria used to assess the credibility, and criteria to purchase, respectively. Mostly, the criteria were ranked in high or highest level of credibility. Only the "qualifications of the topic inquire" (Table 5) and the "intention to purchase products immediately after assessing the credibility of the information" (Table 6) were ranked Moderate.

Results of Hypotheses Tests

Hypothesis 1 Demographic factor There was a relationship with the criteria used to assess the credibility of the information. It was found that gender was not related to the criteria used to assess the credibility of the information. Age was related to the criteria used to assess the credibility of the information. The expertise of the topic inquirer, up-to-date content of the topic, readability and engagement of the topic were related to the different age factors. Education was related to the criteria used to assess the credibility of the information. The expertise of the topic inquirer, and official references were related to the different educational factors. Occupation was related to the criteria used to assess the credibility of the information. The expertise of the topic inquirer, the qualifications of the topic inquirer, writing and conveying skills of the topic inquirer, official references, unbiased content, readability and engagement of the topics, and enthusiasm and speed in replying to topics were related to the different occupational factors. Income was related to the criteria used to assess the credibility of the information. Official references were related to the different income factors.

Hypothesis 2 Behavioral factor of information usage on the beauty web board, the website Pantip.com. There was a relationship with the criteria used to assess the credibility of the information. It was found that the access frequency was not related with the criteria used to assess the credibility of the information. The duration of usage was related with the criteria used to assess the credibility of the information. The expertise of the topic inquirer, the qualifications of the topic inquirer, writing and conveying skills of the topic inquirer, and unbiased content were related with the different durations of usage. The length of time of service usage was related to the criteria used to assess the credibility of the information. The writing and conveying skills of the topic inquirer, unbiased content, respect for the opinions of others or topic respondents, up-to-date topic content, and readability and engagement of topics were related to different lengths of time of service usage. The access status was not related to the criteria used to assess the credibility of the information. The objective of the usage was not related to the criteria used to assess the credibility of the information.

Hypothesis 3: Attitude factor towards the inquirer's experience and information on the beauty web board, the website Pantip.com was related to the criteria used to assess the credibility of the information. It was found that each factor of attitude towards the inquirer's experience and information on the beauty web board, the website Pantip.com was related to the criteria used to assess the credibility of the information in all aspects which had a high level of relationship (see Table 7).

Hypothesis 4: Format of information presentation on the beauty web board, the website Pantip.com There was a relationship with the criteria used to assess the credibility of the information. It was found that each factor of the format of information presentation on the beauty web board, the website Pantip.com was related to the criteria used to assess the credibility of the information in all aspects which had a high level of relationship (see Table 7).

Hypothesis 5: The criteria used to assess the credibility of the information was related to the purchase of products It was found that the criteria used to assess the credibility of the information was related to the purchase of products which had a moderate level of relationship (see Table 7).

Table 7: Pearson Correlation in Terms of Attitude towards the Inquirer's Experience and Information, Format of Information Presentation, Criteria used to Assess the Credibility and the Purchase of Products

Correlation Coefficient		Attitude towards the Inquirer	Presentation Format	Assessment Criteria	Purchase of Products
Attitude towards the inquirer	Pearson Correlation				
Presentation format	Pearson Correlation	.724**			
Assessment criteria	Pearson Correlation	.700**	.795**		
Purchase of products	Pearson Correlation	.586**	.604**	.672**	

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

Conclusion and Discussion

The factors, in various aspects that were related to the criteria used to assess the credibility and the purchase of products, were divided into five aspects namely 1. Demographics 2. Behavior of information usage 3. Attitude towards the inquirer's experience and information 4. Format of information presentation and 5. Credibility of the information.

In terms of the demographic factor, it was found that gender was the only factor that had no relationship with the criteria used to assess the credibility of the information. Since most of the respondents were female, their interests or opinions were in the same direction. Also, in terms of the occupation, age, and average income, all these three factors were consistent because most of the respondents were students and private company employees with income between 10,000-30,000 baht and aged not over 34 years old.

In terms of the behavior of information usage, three factors were not related to the criteria used to assess the credibility of the information namely access frequency, access status, and access objectives. Because the questionnaire respondents answered quite a multitude of questions in the same direction such as the access status of irregular customers was more than 60%, as well as the access to usage more than 1-2 days a week, and the access objectives to follow and read information/seek information only was more than 80%. As for the length of service and the duration of usage, there were similar criteria used in the assessment namely the writing and conveying skills of the topic inquirer. To keep users with the website longer, web administrators may make the web active and more useful.

In terms of the attitude towards the inquirer's experience and information, and the format of information presentation, they were related to the criteria used to assess the credibility of the information at a high level. It was found that the first three criteria that users paid the most attention to and found in almost all factors in both aspects were the writing and conveying skills of the topic inquirer, respect for the opinions of others or topic respondents, and unbiased content. Based on other similar research studies, it was found that these three criteria were the ones users paid attention to as high priority. This probably was because those who used the website Pantip.com wanted to use and find information from people with real experience without bias. Reading comments and exchanging ideas with others, users assessed credibility and made decision to purchase products afterwards. To make clear to users in term of experience of inquirers, a website may rank inquirers based on expertise level.

References

Benjarongkit, Yubol. (1999). *Audience Analysis.* Bangkok: Public Relations Department Faculty of Communication Arts, Chulalongkorn University.

Chatsirimongkol, Pairoj. (1997). *Users' Opinions on Using the Services of Thai Danu Bank Public Company Limited: A Case Study of Pantip Plaza Branch.* Thesis, Master of Development Administration Program in Social Development: Faculty of Social and Environmental Development National Institute of Development Administration.

Chen, C., & Hemon, P. (1982). *Information Seeking: Assessing and Anticipating Uses' Needs.* New York: Neal-Schuman, 52-53.

Johnson, T. J. (1998). Using Is Believing?: Comparing Internet and Traditional Sources on Media Credibility Measures. *Journalism and Mass Communication Quarterly,* 325-340.

Kaewthong, P and Kleechaya P. (2015). Perception of usefulness and accepting information from Sponsored reviews of hotels in Blue Planet room, Pantip.com, *Journal of Public relations and Advertising,* Faculty of communication arts, Chulalongkorn University.

Kanchanathawee, K. (1999). *Motivation, Behavior and Satisfaction of Thai Online Newspaper Readers.* Bangkok: Faculty of Communication Arts Chulalongkorn University

Klapper, J. T. (1960). *The effects of mass communication.* New York: Free Press, 19-26.

Krikelas, J. (1983). *Information seeking behaviour: Patterns and concepts.* Drexel Library Quarterly.

Lumsden, G., & Lumsden, D. (2003). *Communicating with Credibility and Confidence Diverse People.* Belmont, California: Thomson/Wodsworth.

Nawarat Na Ayutthaya, P (2009). *The study of beauty discourse through pantip.com website and its utilization: the case study-the dressing table room in the beauty web board,* MA thesis, Dhurakij Pundit University.

Pantip (2023). *About us,* Retrieved September 2023, from https://pantip.com/advertising/aboutus.

Penphan Rawichotkul. (2001). *An Analysis of Internet Discourse on the Internet Bulletin Board of Pantip Website.* Bangkok: Master's Thesis Faculty of Communication Arts, Chulalongkorn University.

Phanthong, D. (1999). *Theory of Motivation.* Bangkok: Ramkhamhaeng University.

Phobthavorn, B. (2015). The Influence of Comment Quality and Credibility of Comment Sources on Webboards Affecting Consumers. To use information from those comments to buy products or services. *Journal of Business Information Systems,* 102-119.

Rasameechaturong, R (2011). *Reliability of product presentation Cosmetics on the cosmetic website,* MA thesis, Chulalongkorn university.

Stavetin, P. (2003). *Principles of Communication Arts.* 10th edition. Bangkok: Department of Public Relations Faculty of Communication Arts Chulalongkorn University

Tam, C. &. (2016). *Performance impact of mobile banking: using the task-technology fit (TTF) approach.* http://www.emeraldinsight.com.

Media Information Literacy Education and Evaluation System in Japan: An Example of Japanese High School Information Curriculum

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Abstract

Ever since the world entered the digital era, governance of false information becomes a global issue. WHO has even coined the term "Infodemic" to highlight the dangers of false information. False information, as a global issue, has already caused severe problems, challenging the governing capacity of administrators all over the world. In Japan, there are ridiculous but widespread rumors like "running out of toilet paper due to the shortage of masks". On the other hand, with the rapid development of AI technology, the cost of spreading false information is getting lower while the expense of refuting it is getting higher. Media Information Literacy (MIL) is the most effective strategy to address this dilemma. Since the 1980s, Japan has developed a comprehensive media information literacy education system and a learning effectiveness evaluation system based on the experiences of European and American countries. This paper will introduce the Japanese media information literacy education and evaluation system by taking the Japanese high school "information" course as an example, whose course syllabus are closely integrated with the current social reality and the evaluation methods applied are also derived from its learning objectives. The exploration and practice of Japan in the development of media information literacy education and evaluation set a good example for country whoever faces the same situation.

Keywords: Media Information Literacy, Higher Education Study Guide Essentials, Evaluation Guidelines, Evaluation Methods, Evaluation Tools

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การศึกษาด้านการรู้ทันสื่อและระบบประเมินผล ในประเทศญี่ปุ่น : ตัวอย่างจากหลักสูตรสารสนเทศ ของโรงเรียนมัธยมญี่ปุ่น

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บทคัดย่อ

ตั้งแต่ที่โลกได้เข้าสู่ยุคดิจิทัล การควบคุมข้อมูลเท็จได้กลายไปเป็นประเด็นระดับโลก องค์การอนามัยโลกได้นิยามคำว่า “ภาวะข้อมูลระบาด” เพื่อย้ำให้เห็นถึงอันตรายจากข้อมูลเท็จ ทั้งนี้ข้อมูลเท็จนั้นเป็นประเด็นระดับโลกที่ส่งผลให้เกิดปัญหารุนแรงมากมาย ประกอบกับท้าทายศักยภาพในการกำกับดูแลของฝ่ายบริหารทั่วโลก ในประเทศญี่ปุ่นมีข่าวลือน่าขันที่กระจายในวงกว้าง เช่น “กระดาษชำระกำลังจะหมดเพราะหน้ากากอนามัยขาดแคลน” ในขณะที่มีการพัฒนาอย่างรวดเร็วของเทคโนโลยีเอไอ ส่งผลให้ความเสียหายด้านการปล่อยข้อมูลเท็จนั้นน้อยลง หากด้วยแลกมากับความเสียหายด้านการปฏิเสธข้อมูลนั้น ๆ ที่สูงขึ้นเรื่อย ๆ ดังนั้น การรู้ทันสื่อ (Media Information Literacy - MIL) เป็นกลยุทธ์ที่มีประสิทธิภาพสูงสุดในการแก้ปัญหาดังกล่าว ตั้งแต่ช่วงทศวรรษ 1980s ประเทศญี่ปุ่นได้พัฒนาระบบการศึกษาด้านการรู้ทันสื่อแบบครอบคลุม ประกอบกับระบบการประเมินประสิทธิภาพการเรียน โดยอ้างอิงจากประสบการณ์ของประเทศในทวีปยุโรปและอเมริกา บทความนี้จะนำเสนอระบบการศึกษาการรู้ทันสื่อของประเทศญี่ปุ่นและระบบการประเมิน โดยใช้ตัวอย่างจาก หลักสูตร “สารสนเทศ” ของโรงเรียนมัธยมแห่งหนึ่งในประเทศญี่ปุ่น ซึ่งมีแผนการเรียนที่บูรณาการได้ใกล้เคียงกับความเป็นจริงด้านสังคมในปัจจุบัน และวิธีการประเมินที่ประยุกต์ใช้ ได้มาจากวัตถุประสงค์การเรียน การสำรวจและวิธีปฏิบัติของประเทศญี่ปุ่นว่าด้วยการพัฒนาการศึกษาเรื่องการรู้ทันสื่อและการประเมิน ได้กำหนดตัวอย่างที่ดีสำหรับประเทศที่กำลังเผชิญกับสถานการณ์ในลักษณะเดียวกัน

คำสำคัญ: การรู้ทันสื่อ หลักสำคัญของคู่มือการศึกษาระดับอุดมศึกษา แนวทางการประเมิน วิธีการประเมิน เครื่องมือการประเมิน

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Introduction

Since 2019, severely affected by the spread of novel coronavirus infection (hereafter referred to as the COVID-19), governments around the world have taken a series of measures trying to eliminate the adverse consequences of the outbreak. Among these measures, the implementation of a regional lockdown and quarantine of infected neighborhood and individuals is undoubtedly the most effective way. However, while lockdown can stop the movement and certain activities of people and viruses, the wild spread of false information is getting out of control. In Japan, there were rumors claiming that the country was running out of toilet paper due to a shortage of masks. The World Health Organization report even coined the term “Infodemic” to refer to the spread of disinformation related to the COVID-19 outbreak. On the other hand, AI technology is set to break through in late 2022 and early 2023, with the emergence of ChatGPT and Midjourney, AI products have made a strong impression in front of the public. Midjourney, an AI mapping tool, only needs a few keywords to generate corresponding images through AI algorithms, and its realistic visual effects are amazing. Midjourney is even more radical, as it has been used to generate images of the arrest of former U.S. President Donald Trump that are difficult for the average person to distinguish from the real thing with the naked eye. All these situations invariably result in lower costs of producing fake information and higher costs of clarifying it, exacerbating the risk of proliferation of false information.

And the reality is that, besides strong artificial intelligence products, highly developed and interconnected social media is also a powerful driving force of generating and spreading false information. Taking China as an example, new media platform such as WeChat, Weibo, Tik-Tok and Xiaohongshu have greatly changed people’s lifestyles since the day they were born until now, penetrating various fields such as education, finance, entertainment and daily life. While new media tools have facilitated our lives and gradually become an inseparable and important part of our daily lives and work, it has also provided a hotbed for the proliferation of false information. In this circumstance, the role of Media Information Literacy (MIL) is becoming increasingly important. And it is a common concern for the industry and academia to find ways to enhance users’ media information literacy more effectively to tackle problems brought by the rapid development of information technology in modern society, so that they can enjoy the convenience brought by technological development while eliminating the negative effects of digital technology and preventing virtual space from becoming a place outside the law.

Definition of Media Information Literacy Education and Its Significance

Definition of Media Information Literacy

UNESCO's 2013 book *Media Information Literacy: Guidance for Policy and Strategy Development* describes media information literacy as follows, "Media and information literacy (MIL) is the foundation for citizens' access to information and knowledge, free expression, and access to quality education. MIL values the role of media and other information providers (including those on the Internet) in providers) in society and describes the skills and attitudes needed to evaluate and produce information and media content; in other words, it covers a wide range of key competencies that people need to be actively engaged in society." UNESCO combined the original concepts of media literacy and information literacy to come up with the concept of media information literacy. Where information literacy is defined by

(1) The need to be able to clarify and differentiate information.
(2) Ability to identify and access information.
(3) Be able to critically evaluate information.
(4) Management information.
(5) Rational use of information.
(6) Exchange of information.
(7) Use of information and communication technology (ICT technology) for processing information.

Media literacy, on the other hand, consists of:

(1) Understand the role and function of the media in modern society.
(2) Understand the conditions that enable the media to play its full role.
(3) Critically evaluate media content from the viewpoint of media functions.
(4) Self-expression, intercultural communication, and democratic living through the media.
(5) Learning the necessary skills for creating user content (including ICT technology).

In addition, media information literacy is not simply a combination of media and information literacy. But on the basis of the above two literacies, there are also media literacy, information literacy, social network literacy, library literacy, freedom of expression and information literacy, digital literacy, digital media literacy, computer literacy, Internet literacy, game literacy, film literacy, television literacy, journalism literacy, and advertising literacy are developed as a total of twelve related concepts. The concept is a rather comprehensive one, covering of wider range of competencies one should obtain in today's rapidly changing digital world.

In Japan, research on media information literacy began as early as the 1990s. Japanese scholars have formed a complete set of media information literacy education system and learning effect evaluation system by continuously researching and learning from the experiences of European and the United States, and combining them with the actual situation in their own country. They believe that under today's world, the information environment has become richer and various kinds of information are easily accessible to people. However, many people lack the ability to analyze and select information, which means they cannot always get the information they need. At the same time, the lack of information filtering ability increases the risk of information bias under the premise that modern web technologies prioritize information that is relevant to the pages that users have previously searched or viewed. Combining research from Canada and the United States, Midori Suzuki (1998) argues that media information literacy refers to citizens' ability to critically analyze and evaluate media information, access media information, and create various forms of information dissemination in a social context. Media information literacy also refers to measures aimed at acquiring such skills. In other words, what is important in media information literacy is the ability to effectively find the information they need when they need it, and to evaluate and use it appropriately. Naoko Nishida (2002), on the other hand, defines media information literacy as the ability to operate information devices and other media tools, understand how to handle information, obtain the ability and willingness to use information collection and for research activities, and behave ethically when using media, which is also the first time in Japan that media information literacy is linked to ethics. The current definition of media information literacy in Japanese textbooks for all grades is based on the summary of Masami Ido (2006), namely, the qualities and abilities to analyze and understand the characteristics of various media, to have the knowledge to transmit and receive information, to establish better relationships with others, and to achieve self-actualization. In any case, the concept of media information literacy in Japanese academia is based on the premise of creating information, creating and critiquing information. Therefore, it's reasonable to say that, compared with definition of UNESCO, the MIL in Japan is more practice oriented, focusing on the implementation and everyday use of these skills.

The Significance of Media Information Literacy

When talking about the importance of media literacy information, UNESCO points out that in the digital media age, differences in information literacy are an important factor in individual inequality. In the digital age, those who have access to information and media resources have a natural advantage over those who do not have access to these resources. And even among those who also have access to information and media resources, the higher the ability to obtain, analyze and evaluate, the more pronounced the advantage. Media information literacy helps create knowledge-driven, inclusive and open societies. This is essential for modern government management and global citizenship. In addition, media literacy can help minorities tell their own stories using mainstream narratives, increasing the impact of niche cultures and thereby preserving cultural diversity.

In Japan, on the other hand, there are three main reasons for developing media information literacy education:

(1) The prevalence of the internet has led to an increase in information uncertainty

From the perspective of the whole society, the surging need of filtering information on the internet urges the development of MIL education. With the advancement of the Internet, information technology has penetrated all areas of Japanese society. There is a lot of information available on the Internet for problems in daily life. However, in order to protect the so-called "right to freedom of expression" in Japan, information on the Internet is very loosely controlled, which means that although information is readily available to everyone, not all the information collected is correct. While paid information published in Japanese newspapers and magazines is heavily vetted and highly credible, there is a lot of free information on Google, Yahoo and various social networking sites that is not verified. It is difficult to judge the authenticity of each piece of information if media information literacy is low.

(2) Individuals are now able to spread messages easily

And as individuals, after being well-educated about the basic principle of MIL, the possibility of accidentally or intentionally spreading false information will be largely decreased. As the virtual space continues to evolve, self-publishing and its related technologies are flourishing. Individuals can easily use various media platform as well as social networking services to easily deliver and spread information, which makes them an influencer. On the one hand, the increasing number of influencer and social networking services can increase interpersonal interactions and allow people to access information and media resources more easily. But on the other hand, the spread of false information can easily lead to major social problems, and there are many cases of groups committing aggressive acts against individuals through influencers and social networking services. Therefore, everyone must be able to analyze and evaluate information and decide which information should be diffused. This is where media information literacy becomes critical for these individuals who have the ability to transmit and diffuse information.

(3) Media information literacy determines the survival of enterprises

For companies trying to survive in today's highly competitive business world, equipping themselves with sufficient knowledge on MIL will not only facilitate the decision process but also improve their corporate strategy. Media literacy is critical in everyday life and plays a pivotal role in business activities. Lack of media information literacy can damage a company's image and values, and sometimes can even determine the life or death of a company. Some companies' commercials have been criticized by their customer base due to racist or sexist expressions. In many cases, companies themselves are not necessarily aware of the existence of discrimination, but the absence of such awareness is rather the most dangerous. All messages sent by companies are bound to be received and interpreted as some sort of signal. As a company, it is important to consider how these messages, or signals, affect the public. Carefully consider the wording of the message and pay attention to what the message says in relation to gender, race, ethnicity, ideology, etc. Also, in addition to the above-mentioned issues that need to be taken into account when sending messages by company representatives or company public relations, the same attention needs to be paid when sending messages by individual employees. Even when employees use their personal accounts to post information on social networking sites, they should be careful not to post false information or engage in cyber-violence, as this could lead to other Internet users investigating which company the employee works for, which could result in a fatal blow to the company's credit.

Based on the above background, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) has officially decided to add "Information" as a course in the Basic Entrance Examination for General University Admissions, which will be implemented in January 2025, to develop media information literacy, programming, data processing and other skills in order to produce more talented human resources who can make full use of digital technology. Many universities also include media information literacy as part of the required general education curriculum. The content and evaluation system of media information literacy education, which is the foundation of the General Entrance Examination for Universities (GEE), which is Japan's "college entrance examination," is worthy of our attention.

Content of Media Information Literacy Education in Japan

In 2018, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) issued a new "Guideline for Higher Education" (hereinafter referred to as the "Guideline"). For the first time, "Information" was made a required subject in high school, and it was decided that it would be included in the General University Entrance Examination (GUE) organized by the University Entrance Examination Center from 2025. Although MEXT currently leaves the setting of examination subjects and score weights to the discretion of individual universities, and three national universities have already explicitly excluded "information" scores from their overall scores, as more information about the examinations is available and the examination system continues to improve, "information" scores will be included in the overall scores of Japanese universities in the future. However, with the increase of relevant examination information and the improvement of the examination system, the scores of "information" courses will still play a significant role in the Japanese entrance examination.

In this Guideline, the information curriculum is divided into two categories: "Information 1" and "Information 2", according to the school is a general high school or a vocational high school. The overall goal of Information 1 is "To enable students to observe and think about information in a scientific way through learning activities, to use information technology appropriately and effectively to discover and solve problems, and to develop the qualities and abilities that students should have as subjects in the information society." The following are broken down into:

(1) To achieve effective communication, deepen understanding of and skills in the use of computers and data, and deepen understanding of the relationship between the information society and people;

(2) To develop the ability to relate various phenomena to information and to use information and information technology appropriately and effectively to identify and solve problems;

(3) To develop an attitude of proactive participation in the information society while using information and information technology properly.

According to specific teaching content, Information 1 is divided into:

(1) How to solve problems in the information society.
(2) Communication and information design.
(3) Computers and programming.
(4) Information and communication network and data usage.

For these four components, the Guideline states that connections to learning about information and information technology and the information society, about identifying and solving problems, and about using data, need to be considered prior to middle school. Students should take the initiative to identify and clarify problems in the information society and think proactively about solutions from them, and schools should take steps to make computers easy to operate for students regardless of age, disability, language congruence or other relevant factors.

The overall goal of Information 2 is "To enable students to observe and think about information in a scientific way through learning activities, to use information technology appropriately, effectively and creatively to discover and solve problems, and to develop qualities and abilities that will enable them to contribute to the development of the information society as subjects in the future." This is further divided into the following specific categories:

(1) Achieving diverse communication, deepening understanding and skills in the use of information systems and diverse data, and deepening understanding of the relationship between information technology development and social change;

(2) To develop the ability to relate various phenomena to information and to use information and information technology appropriately, effectively and creatively to identify and solve problems;

(3) Foster an attitude of proactive participation in the information society and contribution to its development while using information and information technology properly and for the purpose of creating new values.

In contrast, the teaching content of Information 2 is divided into:

(1) Development of the information society and information technology.
(2) Communication and content.
(3) Information and Data Science.
(4) Information Systems and Programming.
(5) Explore ways to use information and information technology to identify problems and solve them.

In the Information 2 course, students also need to systematically learn about information security and information-related laws and regulations, in addition to discussions and presentations about information technology and the future shape of the information society. In addition, students should also learn what changes data science brings to people's lives and educate them about the use of real data. Finally, students need to set themselves to think about the basic mechanisms and use of computers and information systems, the use of information technology for communication, the use of information technology for data, and the next one or more related tasks in the field of information society and information technology in an effort to identify and solve relevant problems.

From the two slightly different course settings, it's easy to see that MIL education in Japan values the daily practice of filtering, analyzing, and utilizing of information, while considering Japanese students as the future designers and educators of the system, equipping them with relevant skills to help them be part of a virtuous circle and improving individuals MIL thus the overall quality of MIL education system is boosted.

Evaluation Dimensions of Japanese High School Information Courses

In the book "Media Information Literacy: A Guide to Policy and Strategy Development" published by UNESCO, the evaluation of media information literacy is divided into two parts: media literacy and information literacy. The evaluation dimensions of media literacy involves:

(1) Identify and express information needs.
(2) Finding and obtaining information.
(3) Critically evaluate information.
(4) Organizational information.
(5) Ethical use of information.
(6) Communicating information.
(7) Information processing using information and communication technologies.

The evaluation dimensions of information literacy involve:

(1) Understand the role and function of the media in a democratic society.
(2) Understand the conditions under which media can function to their full potential.
(3) Critical evaluation of media contents according to its function.
(4) Use of the media for self-expression, intercultural dialogue and participation in democratic life.
(5) Acquire and use the skills required to produce user-generated content (including ICT).

Based on the guidelines issued by UNESCO and considering the characteristics of primary, junior and senior high school education in Japan, Japan has proposed a systematic approach to achieving the goals of information education:

(1) Practical ability to use information.

(2) The ability to understand information scientifically.

(3) Three evaluation dimensions of attitudes toward participation in the life of the information society.

Specifically, the practical ability to use information consists of:

(1) Appropriate use of information tools according to the task and purpose.

(2) Independently collect, judge, express, process and create the necessary information.

(3) Ability to transmit and communicate information based on the recipient's situation and other factors.

It is generally accepted that these three sub-dimensions are closely related to the "survival skills" of students. Information tools are an important and indispensable component of learning activities such as investigation, summarization, presentation, discussion and debate, which exemplify specific learning activities for the acquisition of basic knowledge and skills and the development of thinking, judging and expressing skills.

The ability to understand information scientifically refers to the ability to understand the characteristics of information tools that form the basis of information use, as well as to understand the basic theories and methods of appropriate handling of information, evaluation and improvement of one's information use. Under the dimension of "the ability to understand information scientifically", it is subdivided into:

(1) Understand the characteristics of information tools that form the basis of information use.

(2) Understand the basic theories and methods of handling information appropriately, evaluate and improve their own use of information.

These two subdimensions do not only require students to have an understanding of the types, mechanisms and characteristics of information tools, but also imply the need to understand the basic theories from various information-related studies, to acquire the necessary methods for the correct use of information and information tools, and to put these theories and methods into practice.

The attitude dimension of participation in the life of the information society refers to the attitude of understanding the role and influence of information and information technology in the life of society, thinking about the importance of information ethics and one's responsibility for information, and striving to participate in the creation of an ideal information society. Under this dimension, the Ministry of Education, Culture, Sports, Science and Technology breaks down:

(1) Understand the role played by information and information technology in modern society and its impact on social life;

(2) The need for information ethics and one's own responsibility for information;

(3) Willingness to participate in the creation of an ideal information society.

Objective understanding of the characteristics of information means does not guarantee the ability to use them successfully in real life. With the rapid development of information technology in society, students increasingly need to understand the positive and negative aspects of information technology and to recognize what effects these elements may have on people and society. These three sub-dimensions will guarantee that students learn how to deal with these aspects appropriately and acquire attitudes to actively participate in the information society.

Through the development of these three dimensions, students will be able to understand scientifically the role of information and information technology in society, and thus understand the problems that arise in the information society itself. In turn, the problems of the information society itself will lead to a scientific understanding of information and information technology, and to the acquisition and use of related competencies in practice. These three dimensions are organically integrated.

Evaluation Methods of Japanese High School Information Courses

Due to the unique nature of information courses, traditional evaluation methods cannot simultaneously achieve the two major goals of “improving teachers' teaching” and “improving students' learning. Therefore, MEXT has adopted the premise that “learning of course content is the basis for evaluation, and how to achieve learning of course content is the basis for evaluation criteria”, and that all subjects will be evaluated from

(1) Knowledge-skills;

(2) Thinking ability - Judgment ability - Expression ability;

(3) Learning ability and humanistic literacy.

While knowledge and skills and various abilities are easier to assess in a test or in practice, learning ability and humanistic qualities, including the "attitude" dimension mentioned above, are more difficult to assess objectively. Therefore, MEXT has included the objectives to be achieved in each of these dimensions in the Guideline.

Specifically for the high school information curriculum, knowledge skills assessment, general technical knowledge can be conducted using traditional exams. In contrast, assessments such as those for more important conceptual understandings require setting up scenarios in which students can observe and experiment in specific situations. Alternatively, students can actually apply the knowledge and skills they have learned in the classroom by explaining the concepts in words, characters, equations, or icons. The assessment of thinking, judging, and expressing skills needs to be done when applying knowledge and skills to solve real-world problems. Therefore, in addition to traditional exams, discussions, reports, presentations, group discussions, work production, and demonstrations are all effective ways to assess. Classroom design becomes very important at this point. In particular, the evaluation of thinking skills is difficult to determine whether growth has occurred through a single lesson. Therefore, competency assessment should be evaluated over a longer span of time (e.g., at the beginning and at the end of the unit). Finally, the assessment of learning ability and humanistic literacy is both an assessment of students' attitudes toward learning and an overall assessment of the entire learning process. Therefore, the evaluation of learning ability and humanistic literacy must be evaluated in the lengthy process of students acquiring knowledge and skills and exercising their ability to think, judge, and express themselves. A general check of notes or assignments and class presentations may make it difficult to get a fair and objective picture of the real situation of all students in the class at the same time. Student self-evaluation can be partly useful, but it is important not to let students simply evaluate themselves as "good" or "bad," but to let them know where they stand and how they can improve. Or the change in attitude over time can be observed through changes in the evaluation of the assignment set. In short, students need to be able to learn in a targeted way with clear criteria. Once students are truly self-directed in their learning, the part the teacher can do becomes minimal.

Evaluation Tool for Japanese High School Information Courses

In 2019, Ai GROW, a visual assessment tool for students' thinking, judging, and expression abilities through an AI engine, was developed by IGS Japan, Inc. and attracted great attention upon its release. In September 2019, the tool was selected as part of the Ministry of Economy, Trade and Industry's "Future Classroom" project. In the four years since its introduction, more than 300 Japanese high schools have introduced the tool into their teaching. Although it was not developed specifically for information courses, its strengths in testing students' non-cognitive skills and exploratory learning abilities have made it an excellent choice as an evaluation tool for information courses as they have become increasingly important. The tool has 5 main features:

(1) All tests are administered on a smartphone or tablet computer. Class time in Japan is 50 minutes for a lesson and 50 minutes for the test. In addition to regular classes, tests can be administered during long class meetings. Since it is not possible to prepare for the test, there is no need to subject students to a uniform test. Students can choose to take the test in class or at home.

(2) All-round evaluation. Tests are evaluated using mutual assessment in addition to self-assessment. Understanding the differences between these two types of assessments will help improve student confidence and help students grow faster. All 25 competencies, including performance and creativity, can be presented on a visual scale.

(3) Exclusive student profile. After completing the test, students can view their test results in real time through a personal report on the test page. In addition to the results of the personality diagnostic and aptitude measures, the personal report includes information on the competencies with high growth potential and specific recommendations on how to develop each competency. This helps students provide an objective analysis of strengths items and areas of deficiency to help with subsequent learning improvements and personal growth. In addition, as they take more and more tests, students can check their growth and keep track of the results of their efforts in real time.

(4) Class management functions. Teachers can also view students' test results from the administrator interface so that the data can be used for formative assessment

and subsequent instruction. In addition to each student's unique profile, each competency can be mapped in classes, grades and schools and grouped according to their respective developmental goals. The tool also allows for analysis through basic statistics. Since competencies and growth can be compared by grade, class and label, the tool can be used extensively to validate the effectiveness of different educational programs and to review and improve programs in light of the actual situation.

(5) Student growth opinions are summarized. According to the test results, teachers can download the opinions of "strong qualities and abilities" and "obvious qualities and abilities of growth" (the first three) of different students, which can reflect the real situation of students recently when filling in their situation in time.

Since the introduction of Ai GROW, Japanese students have improved their mutual understanding and respect for their friends in the process of evaluating each other. During integrated learning time and inquiry activities, students are able to assign tasks more clearly and speak their minds based on their friends' opinions and presentations. The educational activities conducted in Japanese schools have proven to be helpful not only in transforming students, but also in encouraging better communication among students and increasing their awareness of peer evaluation.

Conclusion

As the overall technological level continues to rise, it is increasingly important to pay more attention to the welfare of individuals. Together with the important role of information technology at the level of national governance, how to ensure that the younger generation has excellent media information literacy and bridge the gap of citizens from different background turns out to be an important and imminent issue. While countries with limited expertise and experience having difficulty in finding their own ways, Japan's success on MIL education is a qualified model on developing a system with its own characteristics based on the MIL guidelines issued by UNESCO, and there are a number of lessons to be learned from this experience for other countries.

For countries having the intention to improve their MIL education, its wise to consider starting from the following aspects: The first is to build a system of educational contents and evaluation indexes that reflect learners' media information literacy in multiple dimensions, such as “knowledge and skills”, “scientific cognitive view” and “attitude”, to serve UN’s Sustainable Development Goals. Second, these contents should be integrated into all aspects of daily teaching in the form of learning objectives, while designing teaching for the characteristics of information courses themselves, and objectively evaluating students’ literacy and ability through different teaching scenarios and collecting diverse teaching evidence. Third, media information literacy education should run through one’s learning and life career, and media information literacy education should be studied as a sub-topic of lifelong learning. The teaching content and evaluation system should also be adjusted appropriately at any time according to the development and changes of the information society, so as to avoid the carving of a boat that will result in students’ media information literacy failing to keep up with the times.

References

Fumio Masutani, & Asako Miyasaka. (2023). *San kokuritsudai, jyouhou “haiten nashi” no riyu w a—25nen daigaku ryuugaku koutsu tesuto [The reason that 3 National University “will not grade” Information test - 2025 University Admissions Common Test]. Asahi News.* Retrieved from https://www.asahi.com/articles/ASR2V36B0R2PUSPT009.html

Grizzle, Alton, et al. (2013). *Media and information literacy: Policy and strategy guidelines.* UNESCO.

Hiromi Sasai. (2003). Medeyia riterashi kyouiku no jyuyousei [The importance of Media Literacy Education]. *Special Issue: Comprehensive Study of Media Literacy: A Lifelong Learning Perspective; Part 1: Children and Media, 132,* 61-71.

Masami Ido. (2006). Shakaikei kyouka ni okeru Medeyia riterashi [Social Studies Education for Media Literacy: Examining the Need of Media in Problem Solving]. *Social Science Education Research, 98,* 68-83.

Masami Yoshida. (2013). Kyoushi kyouiku ni okeru medeyia jyouhou riterashi Kenshu no fukyu k dadai ni tuiteno chousa [Investigation on Issues to Disseminate Media Information Literacy in Teacher Education]. *Studies on humanities and social sciences of Chiba University, 26,* 1-12.

Masataka Nakaue, & Jun Moriyama. (2021). Yunesuko no medeyia jyouhou riterashi niokeru konpitenshi gainenn no seiri [Competency Concept in UNESCO's Global Media and Information Literacy Assessment Framework]. *Annual Journal of Teacher Training Support Center Research, 4,* 111-127.

Masato Wada, et al. (2013). Yunesuko kyoushi no tame no medeyia jyouhou riterashi kyouiku karikyuramu [A Guidebook for Media and Information Literacy Curriculum for Teachers (UNESCO)]. *Journal of Tokyo Gakugeki University, 64(2),* 299-325.

Masato Wada. (2020). Medeyia riterashi kyouiku: Nihon oyobi kaigai ni okeru teigi [Media Literacy Education: Definitions in Japan and the world]. *Journal of Tokyo Gakugeki University, 71,* 581-611.

Midori Suzuki. (1998). Medeyia riterashi kyouiku to wa nanika. [What is Media Literacy?] (<Special Issue> Media Literacy). *Information Science and Technology, 48(7),* 388-395.

Ministry of Education, Culture, Sports, Science and Technology. (2018). *Koutou gakkou gakushushidou youryou (Heisei 30 nen kokuji) [Guidance for Higher Education (2018 notice)].* MEXT. Retrieved from https://www.mext.go.jp/content/20220324-mxt_kouhou02-000021499_1.pdf

Ministry of Internal Affairs and Communications. (2022). *Medeyia jyouhou riterashi koujyou shisaku no genjyou to kadaitou ni kansuru chousa kekka houkoku [Survey Results Report on The Current Status and Issues of Measures to Improve Media Information Literacy].* Ministry of Internal Affairs and Communications. Retrieved from https://www.soumu.go.jp/main_content/000820476.pdf

Naoko Nishida. (2002). Medeyia riterashi no gainen wakugumi [The Concept of Media Literacy]. *Journal of the Buddhist University Graduate School, 30,* 167-180.

Shun Sakamoto. (2020). Koronaka to medeyia jyouhou riterashi [COVID-19 pandemic and media information literacy]. *The Journal of Media and Information Literacy, 2(1),* 3-14.

Attitudes towards Robotic Process Automation

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Abstract

This research consists of three objectives: 1. To study attitudes towards work process automation (RPA) 2. To study the structural equation model of factors affecting attitudes towards work processes automation 3. To study the influence of pathways of adjustment, self-esteem and efficiency of the automated work process on competitive advantage and attitudes towards automated work processes.

With 300 samples and confirmatory component analysis and structural equation modelling being used, the results showed that the factor influencing the attitude towards automated work processes with the highest rank was competitive advantage, followed by operational ch aracteristics, self-esteem, adjustment, and the efficiency of the automated work process, respectively. Secondly, the factor that influence the efficiency of the automated work with the highest rank was operational characteristics, followed by self-esteem, adjustment, and competitive advantage, respectively. Thirdly, the factor influencing the competitive advantage with the highest rank was operational characteristics, followed by self-esteem, and adjustment, respectively. In addition, self-esteem and adjustment influenced operational characteristics significantly.

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Businesses could adopt these results in their organization in term of human resource management and development to help their employees increase potential of adjustment and self-esteem to be ready for competition. Also, businesses should put the right person to the right job to achieve the high success of using RPA. In addition, RPA training may be another key success factor.

Keywords: Attitude, Robotic Process Automation, Competitive Advantage, Self-esteem

ทัศนคติที่มีต่อกระบวนการทำงานอัตโนมัติ

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บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์ ดังนี้ 1. เพื่อศึกษาทัศนคติที่มีต่อกระบวนการทำงานอัตโนมัติ (RPA) 2. เพื่อศึกษาแบบจำลองสมการโครงสร้างของปัจจัยที่ส่งผลต่อทัศนคติที่มีต่อกระบวนการทำงานอัตโนมัติ และ 3. เพื่อศึกษาอิทธิพลของเส้นทางของ การปรับตัว การเห็นคุณค่าในตนเอง และประสิทธิภาพของกระบวนการทำงานอัตโนมัติ ที่ส่งผลต่อความได้เปรียบในการแข่งขัน และทัศนคติต่อกระบวนการทำงานอัตโนมัติ

จากการประมวลผลจากกลุ่มตัวอย่าง 300 ตัวอย่าง ด้วยการวิเคราะห์องค์ประกอบเชิงยืนยันและตัวแบบสมการโครงสร้าง พบว่า ปัจจัยที่มีอิทธิพลต่อทัศนคติต่อกระบวนการทำงานอัตโนมัติสูงที่สุด คือ ความได้เปรียบในการแข่งขัน รองลงมา คือ คุณลักษณะการปฏิบัติงาน การเห็นคุณค่าในตนเอง การปรับตัว และประสิทธิภาพกระบวนการทำงานอัตโนมัติ ตามลำดับ ส่วนปัจจัยที่มีอิทธิพลต่อประสิทธิภาพของกระบวนการทำงานอัตโนมัติสูงที่สุด คือ คุณลักษณะการปฏิบัติงาน รองลงมา คือ การเห็นคุณค่าในตนเอง การปรับตัว และความได้เปรียบในการแข่งขัน ตามลำดับ และปัจจัยที่มีอิทธิพลต่อความได้เปรียบในการแข่งขันสูงที่สุด คือ คุณลักษณะการปฏิบัติงาน รองลงมา คือ การเห็นคุณค่าในตนเอง และการปรับตัว ตามลำดับ นอกจากนี้ การเห็นคุณค่าในตนเองและการปรับตัวยังมีอิทธิพลต่อคุณลักษณะการปฏิบัติงานอย่างมีนัยสำคัญอีกด้วย

องค์การและธุรกิจสามารถประยุกต์ใช้ผลการวิจัยครั้งนี้ได้ โดยผ่านการบริหารและพัฒนาทรัพยากรบุคคลในอันที่จะช่วยสร้างศักยภาพในการปรับตัวและการเห็นคุณค่าในตนเองเพื่อพร้อมรับการแข่งขัน การเพิ่มทักษะและมอบหมายงานที่เหมาะสมรวมทั้งการฝึกอบรมการใช้งานกระบวนการทำงานอัตโนมัติก็มีความจำเป็นต่อการเพิ่มประสิทธิภาพของกระบวนการทำงานอัตโนมัติเช่นกัน

คำสำคัญ: ทัศนคติ กระบวนการทำงานอัตโนมัติ ความได้เปรียบการแข่งขัน การเห็นคุณค่าในตนเอง

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Introduction and Objectives

Background and Significance of the Problem

At present, the economic and trade competition has intensified due to the changing economic situations and uncertainties. Under the environment of fiercer business competition, including the launch of new products in the market, and the timely response to the demands of the customers, has become a driving force of a company or an organization to place importance on the efforts to seek the guideline to respond to the management of customers relation to be able to compete with business competitors and to ensure business survival. As a result, business has to adapt itself and develop its own capability all the time to create competitive advantage over its competitors (Tanit Sorat, 2006).

Therefore, the increased efficiency in decision-making based on information will reduce the information's error and taps the employees' potential to create maximum value for business to ensure that business will grow and meet the target faster. Technology is thus used to assist in executing work such as AI or IoT, etc. It contributes to more work efficiency, time-saving, and enables employees to have more time to do what is more useful, especially repetitive, routine work, or work that requires time to execute without the need of expertise, or routine work dealing in data management, especially business that requires a lot of documentation which can create burden to an organization. Moreover, work for people in general has constraint in terms of working hours, tiredness from work, and mistakes from work. So, a new form of technology is used for work namely Robotic Process Automation (RPA).

Robotic Process Automation (RPA) is an automatic working procedure, called Bot, that imitates humans. Humans design working procedure and process, called work training, for Bot. Each created Bot will work based on the pre-determined pattern. It makes a lot of work automatic and faster than before (Jorge et al. 2021) with 24 hours a day. Moreover, the mistakes is rare or even none. It reduces the opportunity of leaking business information as the number of employees who have access to the information is reduced. Therefore, RPA has become digital workforce in business replacing humans.

According to the survey, “Adoption of RPA in Asia-Myth or Reality? in 2018 of PwC”, it was predicted that the automatic system would be used in working procedure up to over 45%. It also saved 2 trillion USD of labor costs worldwide. It was forecasted that it may increase the market size of RPA worldwide as high as 5 billion USD by 2024, as well. In Asia-Pacific, it was estimated that the market size of RPA will grow 203%, valued 2.9 billion USD by 2021, as businesses are aware of work efficiency and ability of RPA.

Moreover, RPA is an automatic work that has an important role in an organization's operation. It saves costs and combines working system to reduce time consumption in working procedure. It works two times faster than humans do, reduces burden from working procedure, eliminates mistakes derived from the collection and feeding of information into the system, as well as increases business opportunity. The ability of RPA in the form of digital workforce can replace human workforce. However, human workers are still necessary. A question arises such as using RPA at work will impact to the attitudes of work of the employees in the organization and what are the factors that influence the employees in the organization in willing to use RPA to work efficiently.

Since RPA has a major role in increasing the competitiveness of an organization and enabling activities, procedures, and changes to increase the efficiency of the organization, the attitudes of the employees and operators towards RPA were studied.

Research Objectives

1. To study the attitudes towards Robotic Process Automation (RPA).
2. To study the Structural Equation Model of factors impacting the attitudes towards Robotic Process Automation.
3. To study the influences of the pathways of adjustment, self-esteem, and performance characteristics impacting the competitive advantage and the attitudes towards RPA.

Literature Review and Theories

Concept of Technology Acceptance

Presented by Camarero, Anton & Rodríguez (2013). The acceptance of technology was the explanation of the acceptance and intention to use new technology of people which derived from the fact that the people perceived simple usefulness and benefit from the usage of new technology and they could learn to use new technology by themselves.

The processes of new innovation acceptance presented by Yaowapa Chuprapawan (2004) involved decision-making of consumers relying on supporting communication and consisted of 5 acceptance processes as follows:

1. Awareness: It is the first step leading to acceptance or refusal of new innovation. The fact that people perceive new innovation for the first time is the process of perception only that innovation takes place and really exists but do not yet receive complete information.

2. Interest: People start to take more interest in searching for information and learning about innovation. This behavior involves intention and uses thinking process than perception process. In this process, people will learn more about new innovation. Personality, value, society, or old experiences have impact on the people and on the follow up of news.

3. Evaluation: It is the consideration process. People will consider the acquired information for its strength and weakness to decide if they should experiment on new innovation. This process is different from others in the creation of decision-making to try new ideas. People tend to think that the use of new things poses a risk of uncertainty. The results of this process therefore need reinforcement to ensure that the thing that is decided to be experimented is correct through advice and provision of news to assist in the decision-making.

4. Trial is the process that people experiment on new innovation completely or partly to prove the benefit of the innovation and wait for the decision whether to accept the innovation or not. In this process, people will seek for news specifically on new innovation, the experiment result of which will be crucial to the decision to refuse or accept the new innovation.

5. Adoption is the final process in the acceptance procedure. It is the process that people accept new innovation after trial and continuous implementation. After accepting the innovation, the target group will seek additional news to support their acceptance decision. If the news that they receive later indicates that they should not accept the innovation, the behavior may arise of cancelling the innovation acceptance. But if the news that is received later is good, the acceptance may be renewed.

Concept of Adjustment

When technology is used in an organization, the personnel impacted by the use of technology are forced to make adjustment. Rogers (1974), leading theorist of oneself and theory of client-centered advice. considered adjustment in terms of self-adjustment. He believed that all humans were the center of the experiences around them which changed all the time. It was part of the experience that a person perceived and interacted with others. The assessment of the interaction created self or “Structure of self”. It was the perceived self in many aspects such as personality, personal ability, own roles in connection with others and environment, attitudes and values of oneself based on individual experience. It was therefore an important part to determine the differences of individual personality. Each individual would feel and would best understand one’s own personal world.

There were 2 types of adjustment:

1. Integrative Adjustment: The adjustment that a person can solve the problem and it makes the person happy, without any remaining frustration, with self-awareness, independence, and self-fulfillment.

2. Non-integrative Adjustment: The adjustment that a person cannot solve the problem but the person knows somewhat how to reduce the tension within oneself. This adjustment requires mental mechanism or self-protective mechanism. The person who cannot adjust oneself will have conflict with new experience, leading to anxiety, frustration, and tension.

The person who can adjust oneself is self-assured, understands and accepts oneself and others, and perceives real experiences. The person will use the experiences and arrange them to be in line of the structure or the personality of oneself without conflict or deviation, and has positive perception and thoughts of oneself.

The person who cannot adjust oneself will have great conflict between the thought of oneself and new experience, leading to tension, anxiety, confusion, uncertainty, loss of one’s privacy, and negative thoughts of oneself.

Kasem Chalermthanakijkosol (2000) stated that adjustment at work meant a person’s ability to face problems or solve problems to work and reach success.

It consisted of adjustment to work, adjustment to work environment, or adjustment in accordance with and in the same direction as the organization's goals.

Concept of Self-Esteem

The concept of self-esteem is the perception that one has potential, value, and pride in oneself. The person who is aware of self-esteem will be brave to face new challenges with ability for adjustment. The person with low self-esteem will have negative attitude towards oneself, lack of confidence, fear of mistakes, lack of ability to initiate things as the person believes that he or she does not have sufficient ability.

Stephes C. Jones (1982, cited in Chanon Komolmal, 2008) discussed the theory of the feeling of self-esteem. It was the state where an individual wanted to increase the assessment of self-esteem in order to be recognized by others fit for his or her own ability and reality. The individual would be more interested in assessing his/her own feeling than assessment from others. It would be one way of feeling self-esteem.

Concept of Competitive Advantage

In terms of increasing business competition, if an organization has superior qualities to competitors, it will be able to efficiently produce goods or services in response to customers and will certainly bring success to the business. So, the concept of competitive advantage comes into being (Competitive Advantage). Based on the study of Woraluck Lalitsasivimol (2016), the variable that could measure competitive advantage must contain efficiency. Efficiency measures the output compared to the costs that are used, ability to execute work that meets the targets and objectives of the organization with quality, innovations including inventions, goods or work procedure that can create value to the organization (Innovation), as well as respond to customers (Responsiveness) of which the goods or services received by customers makes them satisfied, meets the needs, or expectations of customers to forge the highest impression.

Concept of Organization Efficiency

Efficiency is relevant to the use of factors and working procedure with output as indicator. It involves the organization that can operate with the optimum resource utilization, and the least loss. The organization has management system that facilitates production and services that meet the organization's goal. It has an ability to formulate strategies, sub-strategies, techniques, methods, and smart technology leading to appropriate work methods and smooth working.

Thongchai Santiwong (1990) stated that organization efficiency meant the ability of an organization to fulfill the set goals through optimum resource utilization, maintenance resources, tools and equipment, and not causing tension to members, members were satisfied with the widespread participation of everyone in determining the objectives of the organization, responsible for problems or difficulties, and the overall organization could adapt and develop for further existence.

Concept of Robotic Process Automation (RPA)

Robotic Process Automation (RPA) is software or program that helps construct the robot (Bot) to imitate human behavior. Humans design Process and Workflow of work in the old format with repetition replacing human workforce. It enables work to become automatic, reducing mistakes and increasing efficiency. It can also work 24 hours.

Bruno et al. (2017) stated that Robotic Process Automation (RPA) was a software system with the ability to imitate human behavior of the use of technology platform.

Nuttawut Pongsiri (2018) stated that Robotic Process Automation (RPA) was an automatic computer program that could independently work covering all transactions or partly supervise a procedure. It was appropriate for repetitive or routine work which made work faster and more correct. But it could not completely replace humans.

Methodology

The quantitative research focused on the attitudes towards RPA by surveying employees who have known RPA. Using G*Power, by defining the power value to 0.95, alpha to 0.05, number of variables to 12, and effect size to 0.05, to calculate the size of samples, the number of samples was at least 218. Questionnaires were distributed to more than 300 samples to guarantee that the number of samples was at least 218. Lucky enough, 300 samples were returned and proceeded, and the minimum number of samples achieved. All questions were applied Likert scales from 1 to 5 indicating lowest agree to highest agree.

Conceptual Framework and Research Hypothesis

Based on research objectives and literature review, this research came up with eight variables to construct the Structural Equation Model of factors impacting the attitudes towards Robotic Process Automation with the following details:

1. There were two independent variables namely:
   - Adjustment consisted of frustration, anxiety, tension
   - Self-esteem consisted of awareness of self-esteem, and acceptance and self-respect
2. There were two mediator variables namely:
   - Performance characteristics consisted of security, safety, career advancement, features within work, communication
   - Competitive advantage consisted of efficiency, system quality, innovation, and response
3. There were two dependent variables namely:
   - Efficiency of RPA consisted of satisfaction of work, participation in work, and employee engagement
   - Attitude towards RPA consisted of perceived usefulness, intention to use the system, experience in usage

With these variables, the conceptual framework was created as shown in Figure 1 and 15 hypotheses as following:

Hypothesis 1: Adjustment had positive influence on the performance characteristics.

Hypothesis 2: Adjustment had positive influence on competitive advantage.

Hypothesis 3: Self-esteem had positive influence on performance characteristics.

Hypothesis 4: Self-esteem had positive influence on competitive advantage.

Hypothesis 5: Competitive advantage had positive influence on performance characteristics.

Hypothesis 6: Performance characteristics had positive influence on the efficiency of RPA.

Hypothesis 7: Competitive advantage had positive influence on the efficiency of RPA.

Hypothesis 8: Competitive advantage had positive influence on the attitudes towards RPA.

Hypothesis 9: Efficiency of RPA had positive influence on the attitudes towards RPA.

Hypothesis 10: Adjustment had positive influence on the attitudes towards RPA with performance characteristics and efficiency of RPA as mediator variables.

Hypothesis 11: Self-esteem had positive influence on the attitudes towards RPA with performance characteristics and efficiency of RPA as mediator variables.

Hypothesis 12: Adjustment had positive influence on the attitudes towards RPA with competitive advantage and efficiency of RPA as mediator variables.

Hypothesis 13: Self-esteem had positive influence on the attitudes towards RPA with competitive advantage and efficiency of RPA as mediator variables.

Hypothesis 14: Performance characteristics had positive influence on the attitudes towards RPA with efficiency of RPA as mediator variable.

Hypothesis 15: Competitive advantage had positive influence on the attitudes towards RPA with efficiency of RPA as mediator variable.

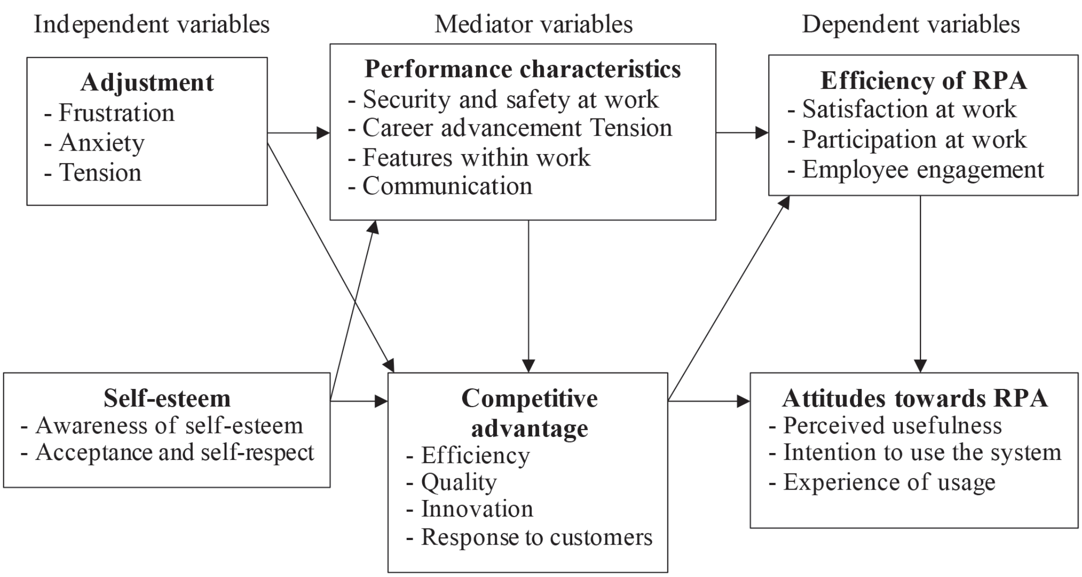

Figure 1: Conceptual Framework

Research Results

The results of the analysis of the general information of 300 samples who were questionnaire respondents, most were female or 214 persons or 71.33%, and 86 male or 28.67%, 201 persons aged 20-30 years old or 67.00%, followed by 64 persons aged 31-40 years old or 21.33%, 19 persons aged 41-50 years old or 6.33%, 11 persons aged less than 20 years old or 3.67%, and 5 persons aged 51-60 years old or 1.67%. Most or 208 persons graduated with B.A. degrees or 69.33%, followed by 71 persons graduated with M.A. degrees or 23.67%, 16 persons lower than B.A. degrees or 5.33%, and 5 persons with Doctoral degrees or 1.67%. Most or 187 persons were private company employees or 62.33%, followed by 40 government officials/government employees or 13.33%, 29 trainees or 9.67%, 24 state enterprise employees or 8.00%, 18 persons in private business or 6.00%, and 2 persons in other occupations or 0.67%.

Most sample or 169 persons had less than 5 years of work experience or 56.33%, followed by 77 persons with 5-10 years of work experience or 25.67%, and 23 persons with 11-15 years and over 20 years of work experience or 7.67%, and 8 persons with 16-20 years of work experience or 2.66%. In terms of position, most or 201 persons were operators or 67.00%, followed by 40 supervisors or 13.34%, 28 managers or 9.33%, 14 trainees or 4.67%, 13 advisors or 4.33%, and others or 4 persons or 1.33%. In terms of average individual monthly income, most or 113 persons with 10,000-20,000 baht or 37.67%, followed by 69 persons with 20,001-30,000 baht or 23.00%, 33 persons with 30,001-40,000 baht or 11.00%, 25 persons with 40,001-50,000 baht or 8.33%, 22 persons with lower than 10,000 baht and with 50,001-60,000 baht or 7.33%, 16 persons with over 60,000 baht or 5.33%. Among them 156 persons or 52.00% had used the Robotic Process Automation (RPA) system and 144 persons or 48.00% had never used the system.

In terms of overall adjustment, it revealed that the questionnaire respondents had opinions at a high level with the mean = 3.95. When divided by each aspect, it revealed that anxiety was at the highest level with the mean = 4.14, followed by tension at a high level with the mean = 3.95, and frustration was at a high level with the mean = 3.81 respectively.

In terms of overall self-esteem, it was found that the questionnaire respondents expressed opinions at a high level with the mean = 4.00. When divided by each aspect, it revealed that awareness of self-esteem was at the highest level with the mean = 4.0, followed by acceptance and self-respect at a high level with the mean = 3.99 respectively.

Overall performance characteristics revealed that the opinions of the questionnaire respondents were at a high level with the mean of 3.99. When divided into each aspect, it revealed that the features within work were at the highest level with the mean = 4.09, followed by career advancement with the mean = 3.97, security and safety with the mean = 3.96, and communication with the mean = 3.93 respectively.

In terms of overall competitive advantage, it revealed that the questionnaire respondents expressed opinions at a high level or the mean = 4.22. When divided in each aspect, it revealed that system quality was at the highest level or the mean = 4.25, followed by innovation with the mean = 4.24, efficiency with the mean = 4.21, and response with the mean = 4.16 respectively.

In terms of overall efficiency of RPA, it revealed that the questionnaire respondents expressed opinions at a high level with the mean = 4.06. When divided into each aspect, it revealed that employee engagement was at the highest level with the mean = 4.10, followed by satisfaction at work with the mean = 4.09, and participation at work with the mean = 3.99 respectively.

In terms of attitudes towards RPA, it revealed that the questionnaire respondents expressed opinions at a high level or the mean = 4.15. When divided into each aspect, it revealed that intention to use the system was at the highest level with the mean = 4.21, followed by perceived usefulness with the mean = 4.18, and experience of usage with the mean = 4.05 respectively.

Results of Hypothesis Tests

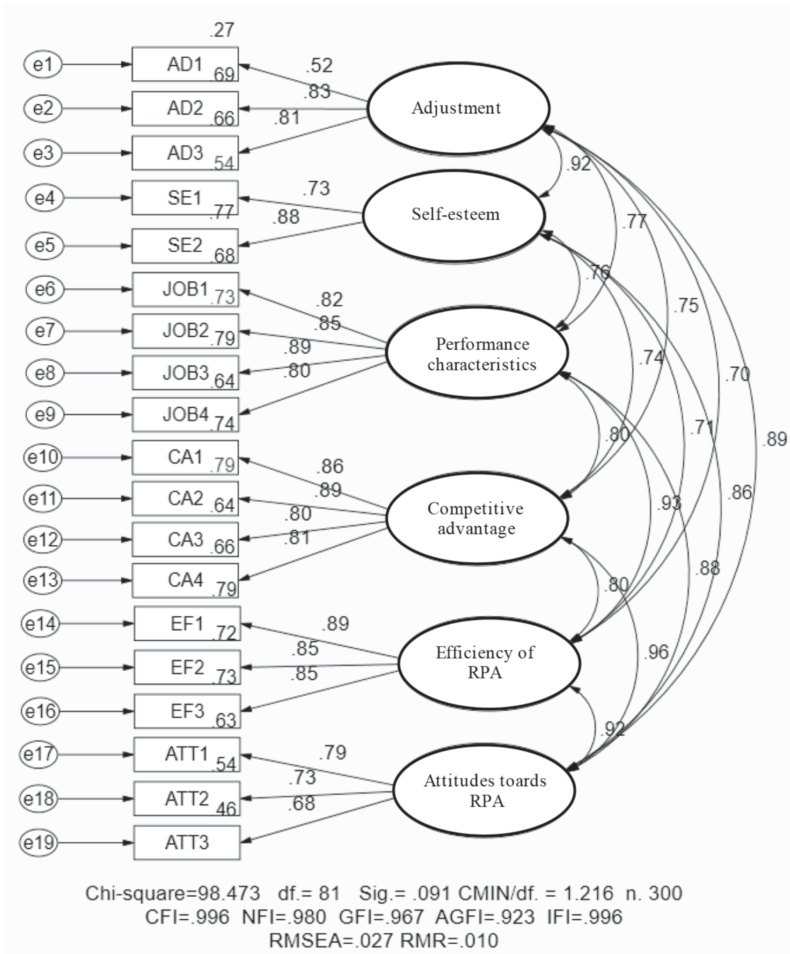

Figure 2: Confirmatory Factor Impacting Overall Attitudes towards RPA

The results of the confirmatory factor analysis of the model of the factors impacting the attitudes towards RPA were congruent with the empirical data at a high level with Chi – Square = 98.473, df = 81.0, Sig. = 0.091 > 0.05, and CMIN/df. = 1.216 < 2.0 with congruence and statistics with Comparative FIT Index (CFI) = 0.996 > 0.90, Goodness of FIT Index (GFI) = 0.967 > 0.90, Adjusted Goodness FIT Index (AGFI) = 0.923 > 0.80, Root Mean Square Error of Approximation (RMSEA) = 0.027 < 0.05, Root Mean Square Residual (RMR) = 0.010 < 0.05, Normed FIT Index (NFI) = 0.973 > 0.90, Incremental FIT Index (IFI) = 0.980 > 0.90, weight of coefficient was between 0.52-0.89 over 0.40, error was between 0.05-0.16, Multiple Correlation (R2) for each item between 27.0-79.0%, Average Variance Extracted (AVE) between 0.542-0.747, Composite Reliability (CR) between 0.774-0.90, Correlation Coefficient between 0.232-0.777, Range value 2.60-4.00, Minimum value 1.00 and Maximum value 5.00 with the mean between 3.81-4.25 at a high level to the highest level, the standard deviation (S.D.) between 0.56-0.73, variance between 0.31-0.53, skewness between (-0.90) and (-0.01), Kurtosis between (-0.47) and 1.81, Coefficient of Variation (CV) between 13.33-18.60%. The information was appropriately distributed. It showed that overall all the observed variables and the latent variables of the model of the confirmatory factor impacting attitudes towards RPA had reliability as in Figure 2.

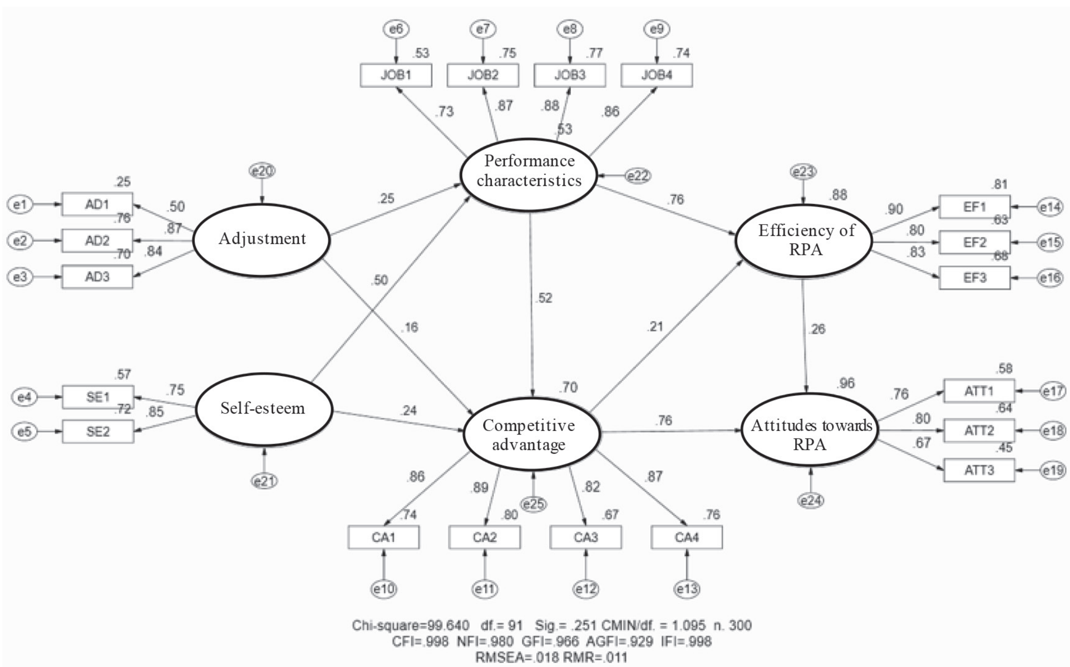

Figure 3: Structural Equation Model of Factors Impacting Attitudes towards RPA

The result of the Structural Equation Modeling of the factors impacting the attitudes towards RPA had the weight coefficient between 0.50-0.90 and Multiple Correlation (R2) between 25.0-81.0%. Based on the analysis of the congruence with the empirical data with the statistical significance at 0.05, Chi–Square = 99.640, df = 91.0, Sig. 0.251 > 0.05, and CMIN/df. = 1.099 < 2.0. It was consistent with the concept of Hair et al. (2006), Bollen

(1989) and Sorbon (1996), Comparative FIT Index (CFI) = 0.998 > 0.90 according to the concept of Hair et al. (2006), Goodness of FIT Index (GFI) = 0.966 > 0.90 according to the concept of Hair et al. (2006) and Mueller (1996), Adjusted Goodness FIT Index (AGFI) = 0.929 > 0.80 according to the concept of Durande-Moreau an Usunier (1999), Root Mean Square Error of Approximation (RMSEA) = 0.018 < 0.05 according to the criteria of Hair et al. (2006), Browne and Cudeck (1993), Normed FIT Index (NFI) = 0.980 > 0.90 according to the concept of Hair et al. (2006) and Diamantopoulos and Siguaw (2000), Incremental FIT Index (IFI) = 0.998 > 0.90 according to the concept of Hair et al. (2006), Root Mean Square Residual (RMR) = 0.011 < 0.05 according to the criteria of Diamantopoulos, Siguaw (2000). It was concluded that the model was congruent with the empirical data according to the level of statistical acceptance as in Figure 3.

Table 1: Results of the Structural Equation Modeling of the Factors Impacting the Attitudes towards RPA

Variables (Path)				λ	SE.	t-value	Sig.	R^2
H1	Performance characteristics	<--	Adjustment	0.25	0.13	2.577	0.010*	53.00%
H2	Advantage	<--	Adjustment	0.16	0.10	2.205	0.027*	70.00%
H3	Performance characteristics	<--	Self-esteem	0.50	0.11	4.556	0.000*	53.00%
H4	Advantage	<--	Self-esteem	0.24	0.09	2.748	0.006*	70.00%
H5	Advantage	<--	Performance characteristics	0.52	0.07	7.507	0.000*	70.00%
H6	Efficiency	<--	Performance characteristics	0.76	0.09	10.290	0.000*	88.00%
H7	Efficiency	<--	Advantage	0.21	0.07	3.419	0.000*	88.00%
H8	Attitude	<--	Advantage	0.76	0.08	8.892	0.000*	96.00%
H9	Attitude	<--	Efficiency	0.26	0.06	3.467	0.000*	96.00%

* With statistical significance at 0.05

As shown in Tables 1 and 2, in terms of the results of the analysis and testing of the Structural Equation Model of the factors impacting the attitudes towards RPA, the variables consisted of adjustment (AD), self-esteem (SE), performance characteristics (JOB), competitive advantage (CA), efficiency of RPA (EF), and attitudes towards RPA (ATT) in total 6 latent variables and 19 observed variables. The results of the analysis revealed that the weight coefficient was between 0.50-0.90 higher than 0.40, Multiple Correlation (R2) was between the variables 25.0-81.0%. In consideration of the regression coefficient of the independent variables of standard score which was the coefficient of determination that identified the direct influence on the path. The results of hypothesis test were summarized as follows:

Hypothesis 1: Adjustment had positive influence on performance characteristics.

Based on the test of hypothesis 1, the regression coefficient = 0.25, error = 0.13, t. - value = 2.577, and Sig. = 0.010 < 0.05. The test result supported the hypothesis H1 or adjustment that had positive influence on performance characteristics and with 53.0% influence on change with the statistical significance at 0.05.

Hypothesis 2: Adjustment had positive influence on competitive advantage.

Based on the test of hypothesis 2, the regression coefficient = 0.16, error = 0.11, t. - value = 2.205, and Sig. = 0.027 < 0.05. The test result supported the hypothesis H2 or adjustment that had positive influence on competitive advantage and with 70.0% influence on change with the statistical significance at 0.05.

Hypothesis 3: Self-esteem had positive influence on performance characteristics.

Based on the test result of the hypothesis 3, the regression coefficient = 0.50, error = 0.11, t. - value = 4.556, and Sig. = 0.000 < 0.05. The test result supported the hypothesis H3 or self-esteem that had positive influence on performance characteristics with 53.0% influence on change with the statistical significance at 0.05.

Hypothesis 4: Self-esteem had positive influence on competitive advantage.

Based on the test result of the hypothesis 4, the regression coefficient = 0.24, error = 0.09, t. - value = 2.748, and Sig. = 0.006 < 0.05. The test result supported the hypothesis H4 or self-esteem that had positive influence on competitive advantage with 70.0% influence on change with the statistical significance at 0.05.

Hypothesis 5: Competitive advantage had positive influence on performance characteristics.

Based on the test result of the hypothesis 5, the regression coefficient = 0.52, error = 0.07, t. - value = 7.507, and Sig. = 0.000 < 0.05.

The test supported the hypothesis H5or competitive advantage that had positive influence on performance characteristics with 70.0% influence on change with the statistical significance at 0.05.

Hypothesis 6: Performance characteristics had positive influence on efficiency of RPA.

Based on the test of hypothesis 6, the regression coefficient = 0.76, error = 0.09, t. - value = 10.290, and Sig. = 0.000 < 0.05. The test result supported the hypothesis H6 or performance characteristics had positive influence on efficiency of RPA with 88.0% influence on change with the statistical significance at 0.05.

Hypothesis 7: Competitive advantage had positive influence on efficiency of RPA.

The test result of the hypothesis 7, the regression coefficient = 0.21, error = 0.07, t. - value = 3.419, and Sig. = 0.000 < 0.05. The test result supported the hypothesis H7 or competitive advantage that had positive influence on efficiency of RPA with 88.0% influence on change with the statistical significance at 0.05.

Hypothesis 8: Competitive advantage had positive influence on attitudes towards RPA.

The test result supported the hypothesis 8, the regression coefficient = 0.76, error = 0.08, t. - value = 8.892, and Sig. = 0.000 < 0.05. The test result supported the hypothesis H8 or competitive advantage that had positive influence on attitudes towards RPA with 96.0% influence on change with the statistical significance at 0.05.

Hypothesis 9: Efficiency of RPA had positive influence on attitudes towards RPA.

Based on the test of the hypothesis 9, the regression coefficient = 0.26, error = 0.06, t. - value = 3.467, and Sig. = 0.000 < 0.05. The test result supported the hypothesis H9 or efficiency of RPA that had positive influence on attitudes towards RPA with 96.0% influence on change with the statistical significance at 0.05.

Based on the Structural Equation Modeling of the factors impacting the attitudes towards RPA, the variables of adjustment (AD) and self-esteem (SE) were independent variables. The mediator variables included performance characteristics (JOB), and competitive advantage (CA), and efficiency of RPA (EF) which would lead to attitudes towards RPA (ATT). Then, the testing result was presented. It revealed the indirect pathway influence and the results of the hypothesis testing were summarized as follows.

Hypothesis 10: Adjustment had positive influence on attitudes towards RPA with performance characteristics and efficiency of RPA as mediator variables.

The test result supported the hypothesis H10 or adjustment that had positive influence on attitudes of RPA with performance characteristics and efficiency of RPA as mediator variables with the path coefficient totaled 0.05 (0.25x0.76x0.26) with the statistical significance at 0.05.

Hypothesis 11: Self-esteem had positive influence on attitudes towards RPA with performance characteristics and efficiency of RPA as mediator variables.

The test result supported the hypothesis H11 or self-esteem that had indirect positive influence on attitudes towards RPA with performance characteristics and efficiency of RPA as mediator variables and with the path coefficient totaled 0.10 (0.50x0.76x0.26) with the statistical significance at 0.05.

Hypothesis 12: Adjustment had positive influence on attitudes towards RPA with competitive advantage and efficiency of RPA as mediator variables.

The test result supported the hypothesis H12 or adjustment that had indirect positive influence on attitudes of RPA with competitive advantage and efficiency of RPA as mediator variables and with the path coefficient totaled 0.01 (0.16x0.21x0.26) with the statistical significance at 0.05.

Hypothesis 13: Self-esteem had positive influence on attitudes towards RPA with competitive advantage and efficiency of RPA as mediator variables.

The test result supported the hypothesis H13 or self-esteem that had indirect positive influence on attitudes towards RPA with competitive advantage and efficiency of RPA as mediator variables and with the path coefficient totaled 0.01 (0.24x0.21x0.26) with the statistical significance at 0.05.

Hypothesis 14: Performance characteristics had positive influence on attitudes towards RPA with efficiency of RPA as mediator variable.

The test result supported the hypothesis H14 or adjustment that had indirect positive influence on attitudes towards RPA with competitive advantage and efficiency of RPA as mediator variables and with the path coefficient totaled 0.20 (0.76x0.26) with the statistical significance at 0.05.

Hypothesis 15: Competitive advantage had positive influence on attitudes towards RPA with efficiency of RPA as mediator variable.

The test result supported the hypothesis H15 or competitive advantage that had indirect positive influence on attitudes towards RPA with competitive advantage and efficiency of RPA as mediator variables and with the path coefficient totaled 0.05 (0.21x0.26) with the statistical significance at 0.05.

Table 2: Results of the Path Analysis of the Structural Equation Model of the Factors Impacting the Attitudes towards Robotic Process Automation

Variables	Influences	JOB	CA	EF	ATT
Adjustment (AD)	Direct	0.25	0.16	-	-
	Indirect	-	0.13	0.25	0.29
	Total	0.25	0.29	0.25	0.29
Self-esteem (SE)	Direct	0.50	0.24	-	-
	Indirect	-	0.26	0.49	0.50
	Total	0.50	0.50	0.49	0.50
Performance Characteristics (JOB)	Direct	-	0.52	0.76	-
	Indirect	-	-	0.11	0.62
	Total	-	0.52	0.87	0.62
Competitive Advantage (CA)	Direct	-	-	0.21	0.76
	Indirect	-	-	-	0.05
	Total	-	-	0.21	0.81
Efficiency of RPA (EF)	Direct	-	-	-	0.26
	Indirect	-	-	-	-
	Total	-	-	-	0.26
R^2		53.0%	70.0%	88.0%	96.0%

The results of the path analysis of the Structural Equation Model of the factors impacting the attitudes towards RPA revealed that the factor that influenced the attitudes towards RPA the highest was competitive advantage with the path coefficient totaled 0.81, followed by performance characteristics with the path coefficient totaled 0.62, self-esteem with the path coefficient totaled 0.50, adjustment with the path coefficient totaled 0.29, efficiency of RPA with the path coefficient totaled 0.26 with 96.0%. influence on change. The factor influencing the efficiency of RPA the highest was performance characteristics with the path coefficient totaled 0.87, followed by self-esteem with the path coeficient totaled 0.49, adjustment with the path coefficient totaled 0.25, competitive advantage with the path coefficient totaled 0.21 with 88.0%. the influence on change. The factor that influenced competitive advantage the highest was performance characteristic with the path coefficient totaled 0.52, followed by self-esteem with the path coefficient totaled 0.50, and adjustment with the path coefficient totaled 0.29 with 70.0%. influence on change. Moreover, self-esteem influenced performance characteristics with the path coefficient totaled 0.50, and adjustment influenced performance characteristics with the path coefficient totaled 0.25 with 53.0%. influence on change.

Conclusion, Discussion, and Recommendations

Conclusions and Discussions

Based on the study of Attitudes towards Robotic Process Automation (RPA), the results of the analysis were used for the discussion of the research findings as follow:

1. In terms of the results of the analysis of the opinions on the factors impacting the attitudes towards RPA, it revealed that the opinion on adjustment was at a high level, the highest was anxiety, followed by tension, and frustration. In terms of self-esteem, the opinion was at a high level, the highest was awareness of self-esteem, followed by acceptance and self-respect. In terms of performance characteristics, the opinion was at a high level, the highest was features within work, followed by career advancement, security and safety, and communication. In terms of competitive advantage, the opinion was at a high level, the highest was system quality, followed by innovation, efficiency, and response. In terms of the efficiency of RPA, the opinion was at the highest level, the highest was employee engagement, followed by participation at work, satisfaction at work. In terms of the attitudes towards RPA, the opinion was at the highest level,

the highest was the intention to use the system, followed by perceived usefulness and experience in usage respectively.

3. In terms of the objectives to study the influences of the adaptation pathways of self-esteem and efficiency in performing work that impacted competitive advantage and attitudes towards RPA, it revealed that the factors that influenced the attitudes towards RPA the highest was competitive advantage, followed by performance characteristics, self-esteem, adjustment, and efficiency of RPA respectively which was in line with the concept of DeLone and McLean (1992) which stated that the quality of system was data processing according to the production data that reflected correct and efficient system with quality as the indicator of the IT system procedure and impacted the satisfaction of users. The factor that influenced the efficiency of RPA the highest was performance characteristics, followed by self-esteem, adjustment, and competitive advantage. The factor that influenced competitive advantage the highest was performance characteristics, followed by self-esteem, and adjustment. Moreover, self-esteem influenced performance characteristics and adjustment influenced performance characteristics with statistical significance.

4. In terms of the objectives to study the attitudes towards RPA, it was found that adjustment had positive influence on performance characteristics, adjustment had positive influence on competitive advantage, self-esteem had positive influence on performance characteristics, self-esteem had positive influence on competitive advantage, competitive advantage had positive influence on performance characteristics, performance characteristics had positive influence on efficiency of RPA, competitive advantage had positive influence on efficiency of RPA and attitudes towards RPA, efficiency of RPA had positive influence on attitudes towards RPA. Moreover, it was found that performance characteristics and efficiency of RPA were mediator variables. The research findings revealed that adjustment and self-esteem had indirect positive influence on attitudes towards RPA, with performance characteristics and efficiency of RPA were mediator variables, adjustment and self-esteem had indirect positive influence on attitudes towards RPA, with competitive advantage and efficiency of RPA as mediator variables, adjustment and competitive advantage had indirect positive influence on attitudes towards RPA, with competitive advantage and efficiency of RPA were mediator variables with the statistical significance.

Recommendations

1. The research findings revealed that the factor that mostly influenced the attitudes towards RPA was competitive advantage. Therefore, importance should be placed on promoting the personnel in an organization to learn and change their method of work to suit the application of RPA at work. in the organization.

2. The research findings revealed that the factor influencing the efficiency of RPA the highest was performance characteristics. Therefore, the organization should place importance on human resource management appropriate to their nature of work, work assignment should be appropriate to the ability and skills, appropriate applications of RPA in accordance with the nature of work in each agency.

3. The research findings revealed that the efficiency of RPA had positive influence on the attitudes towards RPA. Therefore, personnel should be promoted to have knowledge, learning, and special training to increase skills in RPA so that the personnel in an organization understand and have good attitudes towards the application of RPA in the organization.

Recommendations for Future Research

1. The next research should study the comparison of the Structural Equation Model with the attitudes towards RPA, divided by the group of personnel in each type of business with differences in environment and qualification for the maximum benefit of the development and promotion of the RPA.

2. The next research should use latent variable or covariate for example, knowledge and understanding of the use of RPA, acceptance of technology, quality of RPA system should be applied to the model of the attitudes towards RPA in order that the study findings would know the variables that have impact or the covariate that influences the communication so that the study findings will benefit the development of research and the enhancement of the research relevant to the development of the models with more diversities.

References

Bollen, K. A. (1989). *Structural equations with latent variables*. New York: John Wiley & Sons.

Bruno, J., Johnson, S., & Hesley, J. (2017). Robotic Disruption and the New Revenue Cycle: Robotic Process Automation Represents an Immediate New Opportunity for Healthcare Organizations to Perform Repetitive, Ongoing Revenue Cycle Processes More Efficiently and Accurately. *Healthcare Financial Management*, *71*(9), 5561. Retrieved August 12, 2019.

Camarero, C., Anton, C., & Rodríguez, J. (2013). Technological and ethical actecedents of e–book piracy and price acceptance. *Journal of the Electronic Library*, *32*(4), 542-566.

Chananthon Sornurak and Sirinuj Loykulnan. (2020). *Evaluation of Competitive Advantage from Application of automation software in commercial banking business : a case study of ABC Bank Operations*. national academic conference Management, *12*, 732-743.

Chanon Komonmal. (2008). *The use of the Rubin's Self Esteem Scale test in practice. Social work: a study of the cases of those receiving protection in protection and occupational development centers. Kredtrakan House (Master's thesis)*. Thammasat University, Faculty of Social Work.

Diamantopoulos, A. & Siguaw, J. A. (2000). *Introduction to LISREL*: A guide for the uninitiated. London: SAGE Publications, Inc.

Hair, J. F. J., Anderson, R. E., Tatham, R. L., Black, W. C. (2010). *Multivariate Data Analysis* (Sixth ed.), Upper Saddle River, New Jersey, Prentice Hall.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspectives*. Upper Saddle River, NJ: Pearson Education, International.

Jorge, R., Rui, L., Tiago , T., & Sara, P. (2021). *Robotic Process Automation and Artificial Intelligence in Industry 4.0 - A Literature review*. Procedia Computer Science, 2021: 51:58.

Kasem Chalermthanakijkosol. (2000). *Adjustment in the work of employees of mobile phone service companies. Master of Science Thesis*. Industrial Psychology. Bangkok:

Nattawut Pongsiri. (2018, August 26). *Office Automation System*. Thansettakij, 26-27. Retrieved October 10, 2021, from http://www.thansettakij.com/content/308970.

Rogers, C. R., & Wood, J. K. (1974). *Client-Centered Theory Carl Rogers. In A. Burton (Ed.)*, Operational Theories of Personality (pp. 211-258).

Singha Chaweesuk and Sunanta Wongchaturapat (2012), Theory of Information Technology Acceptance. *Ladkrabang Information Technology Journal, 1*(1).

Thanit Sorat. 2006. *Knowledge of logistics*. Bangkok: Proud Press (2002).

Thongchai Santiwong. (1990). *Personnel management*. Bangkok: Thai Wattana Panich.

Wilaiporn Taweelappanthong. (2017). *Moving forward with automation to cope with the digital labor market*. Retrieved August 10, 2021, from https://www.pwc.com/th/en/pwc-thailand-blogs/blog-20171130.html

Yaowapa Chupraphawan. (2004). *Acceptance of new innovations*. Bangkok: Odeon Store.

Sustainable Community Environmental Management Based on Social Capital and Cultural Capital of The Karen Community in Ban Huai Pong Lao, Mae Ki Sub-district, Khun Yuam District, Mae Hong Son Province

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Abstract

The research aimed to 1) Study the context of social capital and cultural capital of the community 2) Study the community environmental management under the context of social capital and cultural capital of the community. It was Qualitative Research, consisting of data analysis and field survey through in-depth interview, focus group, and participant and non-participant observation. The key informants included 31 network committee members, leaders, civil society, the elderly, government officials, community outsiders, and local residents. The tools included semi-structured and unstructured interviews and data analysis according to the Qualitative Research. The research findings revealed the following: 1) In terms of social capital and cultural capital of the community in Ban Huai Pong Lao, it was a very abundant community, with peaceful and simple ways of life, and high level of love and unity among community residents. Moreover, community leaders had potential, community members held religious belief with regular religious practices, network with other communities, eco-system management based on local wisdom

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and belief, use of local wisdom for hand-woven cotton clothes since the ancient times, bond with nature, and rituals were accompanied by traditional beliefs 2) Sustainable community environmental management based on social capital and cultural capital of the community in Ban Huai Pong Lao principally practiced subsistence economy by relying on beliefs, culture, and traditions that were linked and connected with nature and the environment with respect, for example, water source management based on local wisdom, rice cultivation and cattle raising as supplementary occupation to generate income, and outstanding “peaceful and happy” village based on the Sufficiency Economy at the provincial level.

Keywords: Sustainable Community, Karen Community, Environmental Management

การจัดการสิ่งแวดล้อมชุมชนอย่างยั่งยืน บนฐานทุนทางสังคมและทุนทางวัฒนธรรมของชุมชนชาวกะเหรี่ยงบ้านห้วยโป่งเลา ตำบลแม่กิ๊ อำเภอขุนยวม จังหวัดแม่ฮ่องสอน

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บทคัดย่อ

การวิจัยมีวัตถุประสงค์เพื่อ 1) ศึกษาบริบททุนทางสังคมและทุนวัฒนธรรมของชุมชน 2) ศึกษาการจัดการสิ่งแวดล้อมชุมชนภายใต้บริบททุนทางสังคมและทุนวัฒนธรรมของชุมชน เป็นการวิจัยเชิงคุณภาพ ประกอบด้วย การวิเคราะห์ข้อมูลและการสำรวจภาคสนาม โดยการสัมภาษณ์เชิงลึก การสนทนากลุ่ม และการสังเกตแบบมีส่วนร่วมและไม่มีส่วนร่วม ผู้ให้ข้อมูลหลัก ได้แก่ คณะกรรมการเครือข่าย ผู้นำ ภาคประชาสังคม ผู้สูงอายุ ข้าราชการ บุคคลภายนอกชุมชน และประชาชนในพื้นที่ จำนวน 31 คน เครื่องมือประกอบด้วยการสัมภาษณ์แบบกึ่งโครงสร้างและแบบไม่มีโครงสร้าง และการวิเคราะห์ข้อมูลตามการวิจัยเชิงคุณภาพ ผลการวิจัย พบว่า 1) ในด้านทุนทางสังคมและทุนทางวัฒนธรรมของชุมชนบ้านห้วยโป่งลาว เป็นชุมชนที่อุดมสมบูรณ์มาก มีวิถีชีวิตสงบสุข เรียบง่าย มีความรักความสามัคคีในชุมชนสูง ผู้อยู่อาศัย นอกจากนี้ ผู้นำชุมชนยังมีศักยภาพ สมาชิกในชุมชนมีความเชื่อทางศาสนาและปฏิบัติศาสนกิจสม่ำเสมอ สร้างเครือข่ายกับชุมชนอื่น ๆ การจัดการระบบนิเวศตามภูมิปัญญาและความเชื่อในท้องถิ่น การใช้ภูมิปัญญาท้องถิ่นในการทอผ้าฝ้ายทอมือที่มีมาแต่โบราณ มีความผูกพันกับธรรมชาติและพิธีกรรมประกอบกับความเชื่อดั้งเดิม 2) การจัดการสิ่งแวดล้อมชุมชนอย่างยั่งยืนบนพื้นฐานทุนทางสังคมและทุนทางวัฒนธรรมของชุมชนบ้านห้วยโป่งเลา ยึดหลักเศรษฐกิจพอเพียงโดยอาศัยความเชื่อ วัฒนธรรม และประเพณีที่เชื่อมโยงและเชื่อมโยงกับธรรมชาติ และสิ่งแวดล้อมด้วยความเคารพ เช่น การจัดการแหล่งน้ำตามภูมิปัญญาท้องถิ่น การปลูกข้าว การเลี้ยงโคเป็นอาชีพเสริมเพื่อสร้างรายได้ เป็นหมู่บ้านดีเด่นเรื่องเศรษฐกิจพอเพียงระดับจังหวัด

คำสำคัญ: การจัดการสิ่งแวดล้อมชุมชนอย่างยั่งยืน ทุนทางสังคมและทุนทางวัฒนธรรม ชุมชนชาวกะเหรี่ยง

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Background and Significance of the Problem

The past national development from the 1st–7th Development Plans focused on economic and industrial development with the hope of employment growth followed by the growth of other sectors or unbalanced development but resulted in the financial crisis or "Tom Yam Kung Crisis" which caused damage and closure of financial institutions and many businesses in Thailand. There was also debt restructuring with many sales of businesses to foreign companies. The Thai government then announced the floating baht and foreign loans in view of economic recovery. Thailand experienced more foreign debts due to the 1997 financial crisis. At the same time, there was disastrous and widespread destruction of natural resources and the environment. The past development exploited natural resources in particular land, forests, water sources, coastal resources, and underground resources at a very high level and without efficiency. As a consequence, these natural resources degraded quickly and impacted ways of life of rural people who mainly relied on the resources for their subsistence. Afterwards, the 8th National Development Plan was greatly modified with focus on economic rehabilation, financial institution rehabilitation, and assistance to those affected by the crisis to continue their existence. The modified National Development Plan focused on adjusting the macro economy and maintaining economic stability, reducing impacts of the crisis on people, society, and the environment, and accomplishing success in participatory process to drive the social force on development of various fields such as expansion of the "community" network which promoted people participation at the community, sub-district, district, and provincial levels in brainstorming for rectification and local development. It was the starting point to develop and strengthen the community for self-reliance. In particular, the issue of community attracted interest from the United Nations leading to cooperation projects between Thailand (National Economic and Social Development Board and Ministry of Interior) and the United Nations called Thai UNCAP to expand the development of community which met with success, served as a good example, and was recognized at the global level.

The 9th National Economic and Social Development Plan (2002-2006) determined social capital as a national agenda. Office of the National Economic and Social Development Board was assigned as a main agency to formulate the strategies of the development of social capital to serve as the forceful base for the holistic national development (Office of the National Economic and Social Development Board, 2005). The National

Economic and Social Development Board held brainstorming sessions with experts, academics, and those relevant to the development field to create and compile knowledge sources on the concept of social capital to ensure clear direction of the national development. The brainstormings discussed the concept and pinpointed the importance of social capital to develop community in case of the crisis of economic recession. What remained and could be continuously accumulated for people at the grassroots level, the country, and the world was "social capital" which was the inheritance long established and widespread in Thailand from one generation to the next. In particular, the value of wisdom, aggregation, love of families and friends, and love of hometown constituted the factors that made people aware and decide to help one another. These were collectively called "social capital" (Anek Nakhabutr, 2002: 7). Social capital was the foundation of sustainable development (Sansern Wongcha-um, 2003). Therefore, national development placed importance on natural resource management to enhance sustainability and sought to revive natural resource capital. However, the development of social capital needed time as it was sensitive, requiring knowledge, and understanding for careful and cautious operation. At the same time, it must instill natural awareness. The development of social capital must be undertaken to create balance with the development of other domains leading to sustainable development.

Therefore, the community environmental management under the context of social capital and cultural capital was the management which was principally based on beliefs, customs, and traditions linked with nature and the environment. It was the concept that accorded with the Thai society and it was considered the key concept to be driven as part of national sustainable environmental management in tandem with the importance placed on social capital and cultural capital, as well as good and sustainable national resource management. In particular, the Karen community in Ban Huai Pong Lao, Mae Ki sub-district, Khun Yuam district, Mae Hong Son province had long history, outstanding social capital and cultural capital, management and development which were unique to the community, especially community environmental management based on social capital and cultural capital in view of sustainable community development. Due to the importance, the researcher was interested in studying the issue of community environmental management based on social capital and cultural capital with the identity of the ethnic Karens such as wisdom, traditions, beliefs, and rites existed in the community with community environmental management. The information from this study would be used to develop the Karen community in Ban Huai Pong Lao and other communities under the similar context.

Objectives

1. Study the context of social capital and cultural capital of the Karen community in Ban Huai Pong Lao.

2. Study the community environmental management based on social capital and cultural capital of the community in Ban Huai Pong Lao.

Literature Review/Relevant Research Documents

In terms of the background of social capital, based on the past evidences, there were numerous meanings. For the Chinese, it meant the existing object that could be re-exploited such as knowledge and ability, including assets. During the time of Buddha, there was a mention of wealth consisting of external assets such as servants, fields, houses, and internal assets such as goodness, diligence, positive attitude, and beautiful mind notably 7 noble treasures namely Faith as logical belief, Attention to manners and words, Shame of evildoing, Fear of evildoing, Knowledgeable persons or knowledge on ways of life, Sacrifice and generosity, and Intelligence as knowledge and understanding of reason, goodness, difference between right and wrong, and duty mindfulness. These constituted valuable assets which were within good minds rather than external assets as no one could take them away and no harm could damage them. Thus, they calmed the mind. At the same time, the external assets supported doing good deeds which would greatly benefit oneself and others. Similarly to someone with a lot of assets, the person could support himself/herself and make others happy (Worawut Romratapun, 2005).

Hirschman (1984) compared social capital with moral resource that was inexhaustible. This resource would not be beneficial at all if it was not used. On the contrary, other physical capitals would be exhausted if they were used. He also compared social capital with public goods that were accessible to anyone such as pure air, good environment, and safety in public areas. Social capital derived from the private sector who jointly participated in social activities, with attachment, common customs, traditions, and culture, mutual trust, as well as possible change according to different environment and social contexts.

World Bank (1999) discussed social capital and used the concept of social capital in the form of capital necessary for development by striving to answer the question of what social capital was and how to proceed in order to acquire the maximum sustainable development for the country and the community. It was the concept that led to setting up a useful organization. According to the definition of World Bank, social capital presented the evidence that pointed to the increased social affiliation, economic development, and sustainable development.

Sunderlal Bahugana, Chipko movement leader, stated that "The only way to solve the crisis in life and development is for people to return to their cultural roots and the eastern society by focusing on rehabilitation of nature, meaning people must return nature, society, and culture to the economic system through sustainable development" (Preecha Piampongsan, 2006, p. 50).

Robert Putnam, (1993) pointed out that the levels of economic growth and quality of the familial and communal institutions in the north of Italy were higher than in the south. This was the result of Norm of trust and reciprocity, and Civic engagement which were higher and which Putnam defined as social capital.

Narayan and Pritchett, cited from Sinad Treevanchai (2003) gave the opinion that social capital was a kind of "capital" as it could increase household income. They measured social capital from the number of groups/organizations that the household members were members, the level of cooperation in the groups, and the diverse characteristics of the members of the groups. The households with a higher level of these indicators tended to earn more.

Anek Nakabutr (2002) stated that social capital as community strength did not take place recently in Thailand but it was the old value that had already existed in the country. It included kindness, sharing, and generosity, social affiliation, organizational grouping to set up various networks such as savings groups, integrated farmers groups, and network of community mills, etc. The social capital was a major force that drove various communities to be able to increase the value of social capital for their own community, keep abreast with problems, increased ability to handle problems, and finally ability of self-reliance in the long run.

Ammar Siamwalla (2001) stated that social capital was the use of community resources to solve the problems of the most important resources meaning wisdom and generosity. These resources constituted social capital. They were considered the dimension of community resources consisting of norm, generosity, as well as community wisdom which should be applied to social development.

Therefore, social capital reflected the balance of livelihood which suited people in society and which had long disappeared from society. The re-establishment of social capital as the foundation of sustainable social development was therefore the request for society to realize the importance of social capital which linked to social development in various dimensions such as politics, government, environmental management using social capital and cultural capital as the basis of development, with awareness of strong participation of the people sector and the general public's interest in major public issues, leading to trust among one another, respect of law, transparent operation, with contribution to robust and sustainable social development.

Relevant Research Works

Arthit Buddaduang (cited from Suwit Khongson, 2019) studied the ability to use social capital in the community of Ban Bang Prai, Bang Kon Tee district, Samut Songkhram province. The objectives included the following: 1. Study the status of social capital in the community of Ban Bang Prai 2. Study the methods to use social capital in the community of Ban Bang Prai, and 3. Study the problems in using social capital in the community of Ban Bang Prai. It was a case study mainly using qualitative research process. The study findings revealed that the most evident social capital of the community of Ban Bang Prai was "social network" which was strong, with numerous performances and awards. It was followed by "knowledge and wisdom" especially on occupation. The 3rd ranking was "empathy, reciprocity, generosity, and mutual assistance" which was shown from the past to the present. Social capital was used in 3 levels namely 1. Useful to one's own life and family 2. Useful to group or network of occupation and operation, and 3. Overall group or network of community development. The problems or obstacles in using social capital included conflict of business interests and discriminatory support, small number of social workers, and safety problems in outside communities. In order for the community to have relationship and desirable conditions, a driving process was required such as raising awareness for community residents to start to think of joint community development, search for appropriate potential and social capital in community, creation of more leaders or core persons, coordination of cooperation with government agencies and the private sector, action through participation between the community, the public and the private sectors, continuous performance assessment, and extension of results.

Department of Health, Petchaburi Provincial Public Health Office (2000) studied strong social capital in local community as factors that created social capital with the following composition:

1. Value system, ideology, belief which rested on the basis of respect of nature or determination of oneself as part of nature such as belief in sacred objects, protection of nature, rendering close-knit community of environmental protection, and contentment as the foundation of religion. Therefore, it constituted the conscience of munificence.

2. Local wisdom and learning process created and accumulated by the community for subsistence such as agricultural wisdom, folk medicine, resource management, arts and handicrafts, as well as livelihood. These were the community's wisdom with continuous dimensions and details. Moreover, the experience of the community through hard times was also considered social capital.

3. Community wise leaders who possessed wisdom in various aspects of livelihood such as community elderly, spiritual leader, folk doctor, farmer leader, and learned person with major roles in the strengthening process of the community.

4. Structure of linear social relationship facilitated mutual assistance such as family institution, seniority system, cooperation system in all sectors in community.

5. Ownership and joint management system such as rights of community in resource management which were the rights of care and maintenance of common assets in community.

6. Community institutions such as customs, traditions, culture, shared conscience, as well as community organization that controlled the community to follow the existing systems of value and thinking.

7. Cultural diversity resulting in wisdom, different ways of thinking according to eco-system, and social, economic, and political conditions, leading to exchange of experience and strengthen overall society.

8. Groups, organizations, and networks which organized public activities in the civil society such as villager organization, network of people sector, NGO, professional group, and academics who strengthened the community in various issues.

The community of Ban Huai Pong Lao was in possession of unique social capital and cultural capital with the value system and belief in sacred objects that provided protection by nature. As a consequence, the community could closely preserve nature, equipped with agricultural wisdom, folk medicine, resource management through participation process, clothes and household appliances as arts and handicrafts, unique form of habitation construction, community leaders' possession of wisdom on various aspects of livelihood and major role in the process to strengthen community, mutual assistance, ownership right and joint management, customs, traditions, culture, shared conscience, groups, villager organization and network of the people sector, various professional groups, coordination with government officials and academics to strengthen community concerning various issues, as well as sustainable environmental management.

Methodology

The study of "Sustainable community environmental management based on social capital and cultural capital of the Karen community in Ban Huai Pong Lao, Mae Ki sub-district, Khun Yuam district, Mae Hong Son province" was a case study mainly using the Qualitative Research, In-depth Interview with Key Informants together with Participant Observation and Non-Participant Observation, as well as Literature Review from documents to ensure that the study was clear and inclusive by using the Triangulation Technique to inspect the data and use the Rapid Rural Appraisal (RRA) Beebe, J. (1987) to identify the key informants and the researcher determined the methodology with the detail as follows:

1. Document Study and Literature Review such as books, research reports, dissertations, term papers, articles, and relevant academic reports.

2. Field Study through the method of participant observation and non-participant observation as well as interviews

As the study was Qualitative Research and the area was specifically prescribed to reflect the detail of the issue of the study, the researcher determined the key informants by using the technique of Rapid Rural Appraisal (RRA) to acquire the list of a group of key persons from the survey to find the key informants accounting for 50% of the households. Then, 15 persons were selected according to the determined qualifications for accuracy and prevention of bias. Afterwards, the necessary qualifications of the key informants were determined in order to acquire diverse information by dividing the target group and the key informants into 3 groups as follows:

1. The network administration committee for community environmental management in total 5 persons with the following qualifications 1) Must possess detailed information of the network of community environmental management and community organization groups since the establishment until the present 2) Must be committee member or member for at least 5 years and 3) Must be willing to provide information.

2. Members of the network of community environmental management and community organization groups in total 4 persons with the following qualifications: 1) Must be member for at least 1 year and 2) Must be willing to provide information.

3. The members residing no less than 1 year in the community based on the urgent survey and selection in total 15 persons with willingness to provide information.

4. Those outside the network of community environmental management and community organization groups such as community residents who did not join the network, community organization groups, and relevant government officials in total 6 persons who possessed the qualifications and assumed the roles relevant to the network of community environmental management and community organization groups (but who were not committee members or members), and were willing to provide information.

5. Executive of government agency responsible for social and community policy in total 1 person.

The data compilation consisted of 2 methods namely: 1) Informal interview such as interview on the basic information of general contexts and conditions of the community and In-depth Interview by using the guideline of conversation or in-depth interview with knowledgeable persons or key informants on the issue of the usage of social capital which would ensure more information and enable wider interpretation, benefiting the analysis and prior to every interview, the researcher would explain the objectives of the research and the interview methods so that the key informants fully understood them and were willing to provide information in order to prevent the violation of personal rights of the key informants and 2) Observation divided into Non-Participant Observation in the study of basic information, general contexts and conditions of the community, as well as behavior of community residents and Participant Observation in living in the community to learn about the ways of life, as well as participate in activities with the community residents such as meeting to learn of the activities of groups, organizations, and learning centers, etc.

Data Analysis

The researcher used the method of data analysis in parallel with data compilation according to the Qualitative Research. The information acquired from conversation, in-depth interview, informal interview, participant and non-participant observation would be inspected for its accuracy using the Triangulation Technique to inspect the information acquired from different people, time, and locations. Then, the analysis was conducted to link the congruence of the content by adhering to the logic principle compared with the theoretical concept in parallel wih the contexts and research works relevant to the literature review of various documents to ensure that the study results were in line with the set objectives.

Presentation of Information

The descriptive research was presented according to the principle of qualitative research based on anthropological methods in order to have the overview of the sustainable community environmental management based on social capital and cultural capital.

Research Findings

1. The context of social capital and cultural capital of the Karen community in Ban Huai Pong Lao revealed the following:

Context of social capital

1.1 Background of the community of Ban Huai Pong Lao Started with the gathering of workers of a famous foreign company dealing in timber business who was awarded with timber concession in the very lush area of Ban Huai Pong Lao as it had many streams, many small hills, plains for rice and other cultivation which was suitable for habitation. After the company closed down, the group of the workers of approximately 5 households moved in and leveled the area for habitation. Later, friends and families continuously moved in. The community members also produced their own offsprings for the past 70 years. At present, in Ban Huai Pong Lao, there were 57 households and the population of 316. They belonged to the Karen ethnic group and were mostly Christians. They practiced other religions as well but not many. They lived in harmony as they were related. They mainly followed the Karen's beliefs and traditional ways of life. They used the local language (Karen) in their daily lives. The village head and the community leader were natural leaders and jointly built this village. Each was also spiritual leader and leader of community development.

1.2 Good and simple lifestyle The Karen community in Ban Huai Pong Lao had good and simple livelihood. They found food from the vast forests which were preserved forests commonly exploited by many communities. The forests were situated in a national park. The area of Ban Huai Pong Lao, Moo 4, Mae Ki sub-district, Khun Yuam district, Mae Hong Son province covered 6,794 rai. The forests were rich. The community members practiced rice farming, agroforestry, and terraced rice farming. Morever, they were hunters-gatherers for their own subsistence. The household utentils were materials from the forests. They also weaved their own clothes for use in the community.

1.3 Solidarity, unity, and harmony of community residents The community in Ban Huai Pong Lao had strong solidarity, unity, and harmony. At the family level, most families were extended families. As Ban Huai Pong Lao was a remote community, when the children of the community members grew up and reached the marriageable age, they would mostly marry people in the same community. Some did marry people in distant communities. So, the community members were close through marriages, similar to relatives one way or another.

1.4 Community leaders as natural leaders At the community level, the community leaders were natural leaders. They became leaders for the sake of relatives in the community. The community leaders included belief or spiritual leader, political leader, eduction leader, and traditional medicine leader and had to bear the full burden of work for relatives in their own community. At the same time, they must have knowledge, ability, and potential as they continuoulsy upgraded their knowledge especially the Karens' culture and traditions. When they were free from seasonable work, the Karens would visit their relatives faraway. As a consequence, the Karens had rubust, natural social network with close relationship. The Karen society had a very high level of unity which constituted social capital within and outside the community.

1.5 Morals, ethics, and good conduct In terms of morals, ethics, and good conduct, the community members were religious and regularly and strictly practiced all activities of religious rites such as wedding, observance of religious precepts, and conversion to Christianity. Importantly, all families would attend daily religious meeting to read the Bible. In the morning, religious rites were regularly practiced in a location used for religious practice right in the middle of the village, ensuring that all could join the activities. Moreover, the traditional beliefs of the Karens' general ways of life included respect for nature such as forests, rivers, exploitation of water from rivers and wood from forests with optimal value. This was similar to the the teaching that when they exploited the forests, they must respect them and when they exploited water, they must respect water and rivers, etc.

1.6 Mutual support in participating in activities related to community and members There was mutal assistance in activities related to the community and the members such as construction of dam for terraced rice farming, rice harvest one plot after the other until the harvest was finished in the entire village. Moreover, there were gatherings in community such as the housewife group for making community products such as weaving, souvenirs, herbal medicine, and utensils from natural materials, from the vast forests and from the wisdom of the community residents, as another channel of supplementary income for the community members.

1.7 Network with other communities The gathering for the establishment of network with other communities included forest fire surveillance network with the role of extinguishing forest fire. In the dry season, the community leaders would assign time for both children and adults to build firebreaks to prevent forest fire during the season. It was cooperation based on love and unity of the people in the community and those from other communities. It was the network of people from different areas at the provincial level. Moreover, there were village health volunteers who monitored the health of the community members and those in adjacent communities. There was cooperation with the public and the private sectors to prevent forest fire in order to assist and ease the burden of government agencies.

1.8 Livelihood of the Karens The Karens' livelihood was managed by the eco-system based on long-standing wisdom and beliefs. The attachment between people and nature reflected in nearly all ways of life such as agroforestry, terraced rice farming, water management using wisdom from one generation to the next, and wisdom for cattle husbandry (cows and buffaloes in the forests). All the food source management constituted the way of life with reliance, and harmonius and seamless relationship connecting people and the forests. For example, the Karens believed that terraced rice farming would capture water for higher rice yields. The form of farming relied on the eco-system with water from watershed forests, nutrients from agroforestry, crop rotation farming for animal husbandry and burning of weeds. The characteristics of terraced rice farming with small plots depending on the hill slopes would efficiently serve as a weir, increasing soil humidity and ensuring soil dampness, accumulating underground water, as well as providing habitats for small animals, and food sources for the community residents.

1.9 Wisdom of hand-woven cotton clothes since the ancient times The Karens in Ban Huai Pong Lao liked to wear hand-woven cotton clothes since the oldern days. They would either grow or buy cotton, spin the cotton into yarn, then dye the cotton with natural dyes, and design patterns derived from nature. For example, the pattern of python on women's clothes was thought that the wearer must be intelligent and swift like pythons, and the embroidery with cotton threads and hem embroidery. The Karen women would transfer the wisdom of weaving process to their daughters. They would start the process with simple pattern until they were skillful and could design their own patterns. For the dyeing of cotton, they would use natural colors or from barks. The Karens created the patterns and colors of woven clothes from nature and surrounding environment. The clothes were therefore beautiful and retained the uniqueness of the Karens. The woven Karen clothes were on sale and supported by the community development department of Khun Yuam district as the province's renowned product.

1.10 Beliefs In terms of their beliefs, the Karens were very attached to nature. They also respected nature and sacred objects. Moreover, they also practiced spiritual rites relevant to their ways of life such as respects for the spirits of field crops, rice, forests, and mountains. As the Karens were attached to nature all the time, they performed diverse ceremonies and traditions for their livelihood such as ceremony of offering sacrifices to spirits, worshipping spirits, alcohol brewing, ritual chicken killing, and tying raw cotton around participants' wrists which were connected to the New Year tradition. The village head would set the date in advance. The ceremony marked the beginning of the season to make one's living and ensure peace and happiness in the community.

In terms of marriage tradition, the Karen young people would choose their own spouse. The bride would weave clothes, pants, and bags for the groom. The bridal couple had to perform ritual killing of pig and chicken to inform their ancestors and as food for the wedding guests. Once married, the groom came to live with the bride's family. With the harvest season, they would move out to build another house nearby. This was the way of expanding the Karens' families. As a result, society had good livelihood based on unity, concern, and mutual support leading to robust society and forceful cooperation for community development in view of future progress.

1.11 Ritual practices The rituals of the Karens in Ban Huai Pong Lao were combined with traditional beliefs such as the Karens respected spirits, with strict ceremony of offerings and sacrifices. Later, after conversion to Christianity, the old beliefs persisted. As could be seen from the belief of spiritual life force, activities required offering to the guardian spirit to seek support from their ancestors. It would ensure progress at work, high agricultural yields, peace and happiness, protection of the descendants, as well as forgiveness from sacred objects for any offense.

2. Sustainable community environmental management based on social capital and cultural capital of the Karen community in Ban Huai Pong Lao constituted community economic management mainly for subsistence by relying on beliefs, culture, and traditions connected and related to nature and the environment with respect towards forests and rivers such as rice farming and livestock farming.

2.1 Water and water resource management were conducted based on the Karens' wisdom. At the arrival of the rainy season prior to the annual rice farming, the villagers would join hands in repairing and building additional dam to prepare for the annual farming and sowing. Rituals would be practiced to respect the spirit of the dam prior to farming by offering the sacrifices such as alcohol, food, chicken or pig. The objective was to inform and beseech the spirit of the dam to provide abundant rice, sufficient water, and protect the farmers with good health and safety. The Karens' ceremony did not only show gratitude towards water but also reflected close familial relationship. Moreover, it forged unity among those who shared the water in the community. It was the Karen community's upland water management that derived from learning to live with nature and preserved old wisdom of the old generations. This was highly beneficial as it would benefit the forest eco-system. The watercourse would provide humidity. Prior to terraced rice farming, the Karens would survey the watercourse from the watershed forest to the farming area in order to use the water for the terraced rice farming. This would consist of 3 parts namely small irrigation channel dug by the villagers to connect large water sources in the watershed forest and along the contour of the hillside to bring water from the upland area to be used in terraced rice farming which was cascading along the plains between the valleys and served as the aquaduct. As for the farming areas which were higher than the main streams or the rivers, the villagers would use the method of bringing water by building a weir made from natural materials such as stones, tree branches, or bamboos in intertwining layers using wood as the main supporter to heighten the level of water and divert the main watercourse to flow into the weir and to be used for terraced rice farming. The weir would also be useful in slowing down the water flow, capturing sediment, enhancing humidity to the soil which was suitable for farming and also provided habitat for aquatic animals. The terraced rice farming that received water from the weir system would appropriately facilitate the farming.

2.2 Rice farming of the Karens in Ban Huai Pong Lao consisted of rotational agroforestry and terraced rice farming in the watershed forest by releasing water and natural nutrients into the farming area without using any chemical that would damage nature. Rice from the farming would be truly natural rice. The area around the streams would be left to serve as the forest belt to prevent the collapse of the embankment. Crop rotation was practiced as terraced rice farming provided insufficient farming area.

It was therefore necessary to adopt rotational agroforestry to increase the rice farming area in order to have sufficient yields for the consumption of the community members. In terms of the terraced rice farming on the hilly area around the community residences, most rice farming areas were inherited from one generation to the next. On the average, each family owned up to 2 to 8 rai depending on the size of the members of each family. The smaller the number of the family members, the bigger the farm land.

2.3 In terms of cattle husbandry of the Karens in Ban Huai Pong Lao, the animals would be left to graze in nature. During the rainy season and during the entire farming season, the cattle owners would monitor their cattle from time to time. Afterwards, the villagers would bring the cattle to graze in the forest area which was adjacent to the village and the farming area. The cattle husbandy provided additional income. Each family owned at least 5 cattle, or 35 was the maximum cattle raised by a family. The nature of raising and selling the cattle depended on a family's spending needs. Sometimes, the cattle were killed for food to limit their population. When the food in the forest was insufficient for the number of the cattle, the community in Ban Huai Pong Lao had very littile problem about the issue. Cattle husbandry according to the wisdom of the Karens involved no costs. The mating and the birth of the calves were natural.

Discussion

Sustainable community environmental management based on social capital and cultural capital of the Karen community in Ban Huai Pong Lao consisted of agroforestry, terraced rice farming, and cattle husbandry. It was community environmental management that understood and had access to the eco-system of the forests, rivers, and other natural resources until it became wisdom, tradition, custom, culture which were accumulated from one generation to the next. It constituted the social capital and cultural capital that could live in harmony with nature similarly to a same large family. The village members did not have economic problems. They earned income from cattle raising (cows and buffaloes) in nature, income from forest products, sales of souvenirs by the housewife group. All income came from sustainable community environmental management based on social capital and cultural capital. So, all the household members in the community had no debt and the village was awarded with the outstanding "peaceful and happy" village based on the Sufficiency Economy at the provincial level according to the project to honor village leaders in 2016. This was in line with the concept of Robert Putnam (1993) who pointed out that the levels of economic growth and quality of the familial and communal institutions in the north of Italy were higher than in the south. Ammar Siamwalla (2001) stated that social capital was the use of community resources to solve the problems of the most important resources meaning wisdom and generosity which constituted social capital. They were considered the dimension of community resources consisting of norm, generosity, as well as community wisdom which should be applied to social development. This was the result of Norm of trust and reciprocity and Civic engagement which were higher and which Putnam defined as social capital. The Karen community in Ban Huai Pong Lao had a very high level of solidarity, unity, and harmony among the community residents as most families were extended families and community leaders would work for the sake of the relatives in the community. For example, faith leader or spiritual leader, political leader, education leader, traditional medicine leader would bear the full burden of work to ensure that their relatives in the community had a very high level of trust and reciprocity, resulting in networks in their own community and adjacent communities such as forest fire surveillance network, housewife group network, village health volunteer network, etc.

This was also in line with the concept of Narayan and Pritchett (Sinad Treevanchai (2003) who gave the opinion that social capital was the “capital” that could increase household income. They measured social capital from the number of groups/organizations that the household members were members, the level of cooperation in the groups, and the diverse characteristics of the members of the groups. The households with a higher level of the indicators tended to earn more. Similarly to the community in Ban Huai Pong Lao, groupings were formed for mutal assistance, based on the characteristics of each member of each family with different, various capital within the member himself/herself and with strengths and weaknesses. The gathering and mutual assistance efficiently enabled the community to rely on itself. The group of housewives made community products to earn income as supplementary occupation when free from field crop farming, rice farming, and searching for forest products. The grouping of village health volunteers took care of the health of the community residents. The group for the preservation of community environment cooperated with other Karen ethnic communities for the management of the vast and sustainable forests to ensure abundant forests.

As a result, the community could find more forest products and earn more income.

Moreover, Sunderlal Bahugana, Chipko movement leader, stated that “The only way to solve the crisis in life and development is for people to return to their cultural roots and the eastern society by focusing on rehabilitation of nature, meaning people must return nature, society, and culture to the economic system through sustainable development” (Preecha Piampongsan, 2006, p. 50).

Suwanee Kamman argued that if Thailand could use the existing social capital for appropriate preservation, rehabilitation, development, enhancement, and utilization, it would raise the quality of life of people in the country to be happy, and make the country balanced and sustainable (Suwanee Kamman et al., 2008: Pp. 1-2).

Moreover, in Thailand, there were numerous examples which demonstrated that social capital particularly the grouping or congregation for own resource allocation of people in a community with mutual trust could make them reap many economic benefits such as setting up of saving group as funding source, grouping for allocation of water sources, forests, public land of the community, alternative farming group, etc. The more diverse these groups or networks could connect with outside groups, the wider social capital.

Conclusion and Recommendations

Based on this research, the researcher found the key and interesting issues as follows:

The sustainable environmental management based on social capital and cultural capital of the Karen community in Ban Huai Pong Lao, agroforestry, terraced rice farming, and cattle husbandry constituted community environmental management that understood and had access to the eco-system of the forests, rivers, and other natural resources until it became wisdom, tradition, custom, and culture. The villagers could live in harmony with nature similarly to a large family. They did not have economic problems as they earned income from cow raising in nature, income from forest products, and sales of souvenirs by housewife group. Subsequently, all family members in the community had no debt and the village was awarded with the outstanding “peaceful and happy” village based on the Sufficiency Economy at the provincial level according to the project to honor village leaders in 2016. This was in accordance with the concept of Anek Nakabutr (2002) stated that social capital as community strength did not take place recently in Thailand but it was the old value that had already existed in the country. It included kindness, sharing, and generosity, social affiliation, organizational grouping to set up various networks such as savings group, and network of integrated farmers group. The social capital was a major force that drove various communities to be able to increase the value of social capital for their own community, keep abreast with problems, increased ability to handle problems, and finally ability of self-reliance in the long run. Furthermore, Following the concept of Sunderlal Bahugana, Chipko movement leader, who stated that "The only way to solve the crisis in life and development is for people to return to their cultural roots and the eastern society by focusing on rehabilitation of nature, meaning people must return nature, society, and culture to the economic system through sustainable development" (Preecha Piampongsan, 2006, p. 50).

In terms of the context of social capital and cultural capital of the Karen community in Ban Huai Pong Lao, the community leader and the faith leader had knowledge, ability, and network of the Karen ethnic groups. They were unified as the community was like family. They adhered to beliefs, tradition, and culture according to the old ways of life and strict practice. They managed to preserve the community awareness according to the ethnic ways amidst changes from the outside society. This was in line with the concept of Pornchai Preechapanya and Warin Jirasuktaveekul on the wisdom of the Karens and the sustainability of the eco-system of the watershed forest such as wisdom of the Karens on cattle raising in the forests, practice of agroforestry, and eco-system management of field crop farming and rice farming (Pornchai Preechapanya and Warin Jirasuktaveekul, 2001, Pp. 10-15).

In terms of recommendations, the community should drive together with other ethnic groups for the rights of community to live with the forests under the context of social capital and cultural capital of the Karen community and undertake sustainable community environmental managment through the beliefs and respect for nature according to the ways of the Karens. If the social capital was seen truly as important, the government should modify their perception towards the congregation of people to have a part to play in the resource allocation of their own community.

References

Ammar Siamwalla. (2001). *Picking up the pieces: Bank and corporate restructuring in post-1997 Thailand.* In ESCAP (Ed.), *Governance Re-Invented: The Progress, Constraints, and Remaining Agenda in Bank and Corporate Restructuring in East and South-East Asia.* United Nations, Economic and Social Commission for Asia and the Pacific. Bangkok.

Anek Nakabutr. (2002). *Social capital and civil society in Thailand.* Bangkok: Social Fund Office and Government Savings Bank.

Beebe, J. (1987). *Rapid appraisal: The evolution of the concept and the definition of issues.* In Khon Kaen University (Ed.), *Proceedings of the 1985 international conference on rapid rural appraisal.* Siriphan Press. Khon Kaen, Thailand.

Hirschman, E. C. (1984). *Experience seeking: A subjectivist perspective of consumption.* Journal of Business Research.

Knack, S., & Keefer, P. (1997). *Does social capital have an economic payoff? A cross-country investigation.* The Quarterly Journal of Economics, November.

Mitree Intria. (2017). *Social Capital Learning Institute for Everyone (LIFE). Social Capital, 9*(2), July-December.

Narayan, D., & Pritchett, L. (1997). *Cents and sociability: Household income and social capital in rural Tanzania.* Policy Research Working Paper 1796. Washington, DC: The World Bank.

Office of the National Economic and Social Development Board. (2002). *Ninth National Economic and Social Development Plan, 2002-2006.* Bangkok: Office of the Prime Minister.

Pornchai Preechapanya, & Warin Jirasuktaweekul. (2001). *Karen knowledge about the sustainability of forested watershed and agroforestry ecosystems. Journal of The Forestry Research, 3*(1).

Preecha Piempongsarn, Kanchana Kaewthep, & Kanoksak Kaewthep. (2006). *A new way of development methodology for studying Thai society.* Chulalongkorn University Press. Bangkok, Thailand.

Putnam, R. D., Leonardi, R., & Nanetti, R. Y. (1993). *Making Democracy Work: Civic Traditions in Modern Italy.* Princeton, New Jersey: Princeton University Press.

Sansern Wongcha-um. (2011). *National development planning.* Bangkok: Phet Rung Printing Center.

Sinad Treevanchai. (2003). *Social Capital and the Performances of Savings Groups: A Case Study in Songkhla.* Master's Thesis, Faculty of Economics (English Program), Thammasat University.

Suwit Khongsong, Suwicha Kosaiyawat, & Chanchalee Mapudh. (2019). Community Empowerment of Taling Chan Floating Market Community, Bangkok Metropolitan Based on Social Capital and Cultural Capital. *Journal of Education and Social Development, 14*(2).

Thompson, M. (2018). Social capital, innovation and economic growth. *Journal of Behavioral and Experimental Economics.*

Worawut Romratapun. (2005). *Social capital, a project to enhance learning for a happy community.* Chulalongkorn University Press. Bangkok, Thailand.

World Bank. (1999). *Social Capital, Household Welfare and Poverty in Indonesia.* Working Paper No. 6. Washington, DC.

Recommendations for the Submission of Papers for Publication in NIDA Development Journal

1) NIDA Development Journal is a quarterly publication; 1) January-June 2) July-December. Papers are accepted both in Thai and in English.
2) The papers submitted for publication must be academic works in the field of development administration: Policy, Administration, and Development.
3) The types of contribution include Academic Articles, Research Articles, Journal Articles, Review Articles, Book Reviews, and Article Reviews.
4) Each paper submitted for publication will be rigorously reviewed by the Editorial Team and at least two reviewers, who are knowledgeable in the field. A decision by the Editorial Team is considered final.
5) The submitted papers must be unpublished works and must not be currently under consideration for publication elsewhere.
6) The papers must contain the following:
   - Title both in Thai and in English
   - Names and surnames, contact addresses, and emails of all authors both in Thai and in English
   - Abstract of 150-250 words both in Thai and in English
   - Keywords of 3-5 words both in Thai and in English
7) The text must be printed with single space on one-side of A4 paper, with no longer than 20 pages, and with margins of 2.5 cm. for top and left sides, and 2 cm. for bottom and right sides.
8) Printing of Title both in Thai and in English
   1. **Title** in Thai must be printed in TH SarabunPSK 18 points bold and in English in Time New Roman 14 points, bold.
   2. **Author** in Thai must be printed in TH SarabunPSK 16 points and in English in Time New Roman 12 points on the next line beneath the title.
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- In Thai, use “**หน่วยงานผู้แต่ง**” such as **หน่วยงานผู้แต่ง:** ภาควิชาการศึกษา คณะศึกษาศาสตร์ มหาวิทยาลัยนเรศวร
- In English, use “**Affiliation**” such as **Affiliation**: Department of Education, Faculty of Education, Naresuan University

4. Abstract in Thai must be printed in TH SarabunPSK 16 points bold, and in English in Time New Roman 12 points bold, with the following wording:
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- In English, use “**Abstract**” or “**ABSTRACT**”.

5. Keyword in Thai must be printed in TH SarabunPSK 16 points bold, and in English in Time New Roman 12 points bold, with the following wording:
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7. Reference in Thai must be printed in TH SarabunPSK 16 points bold, and in English in Time New Roman 12 points bold, with the following wording:
- In Thai, use “**เอกสารอ้างอิง**” or “**รายการอ้างอิง**” or “**บรรณานุกรม**”.
- In English, use “**References**” or “**REFERENCES**” or “**Bibliography**” or “**BIBLIOGRAPHY**”.

8. Graphs, tables, illustrations must be both in Thai and in English.

9) The paper (Word file and PDF) plus a submission form should be submitted via ThaiJO system (Thai Journal Online System) at http://www.tci-thaijo.org/index.php/NDJ.

10) References must abide by the APA Style system and must be alphabetically shown. For Thai references, reference list must be added by translating Thai references into English. The details and examples of references are highlighted as follows:

Books

Name of the author. (Year of publication). *Title.* Number of edition. Place of publication: Publisher.

Davis, Keith. (1967). *Human Relation at Work: The Dynamic of Organization Behavior.* New York: McGraw-Hill

Articles in Journals

Name of the author. (Year of publication). Name of article. *Name of journal*. Year (month): Page number.

Egloff, G. & Fitzpatrick, A. (1997). Vocationally Oriented Language Learning. *Learning Teaching Journal. 30* (July): 226: 242.

Websites

Lynch, T. (1996). *DS9 trials and tribble-actions review*. Retrieved October 8, 1997, from Psi Phi: Bradley's Science Fiction Club Web site http://www.bradley.edu/campusorg/psiphi/DS9/ep/503r.html

Mershon, D. H. (1998, November-December). *Star Trek on the brain: Alien minds, human minds*. American Scientist, 86, 585. Retrieved July 29, 1999, from Expanded academic ASAP database.

Other Sources

Agrawal, A. (2008, March 5-6). *The role of local institutions in adaptation to climate change*. Paper presented at the Social Dimensions of Climate Change, Social Development Department, The World Bank, Washington, DC.

Central Statistics Office of Republic of Botswana. (2008). *Gross domestic product per capita 06/01/1994 to 06/01/2008* [Statistics]. Available from CEIC Data database.

Supakorndej, S. (2003). *The process of recycling bank on Ban Thai Samakee community in Ban Pong, Ratchaburi*. Unpublished Master's thesis, Mahidol University.

Wilfley, D. E. (1989). *Interpersonal analysis of bulimia.* Doctoral dissertation, University of Missouri, Columbia.

Examples of References

Prachason, Sajin. (2009). *The Development of Food Security Indicators*. Sustainable Agriculture Foundation (Thailand).

Office of Agricultural Economics (2005). *Level of Thailand's Food Insecurity.* Bangkok: Office of Agricultural Economics.

Agricultural Land Reform Office, Maha Sarakham. (2009). *Annual Report.* Maha Sarakham: Apichart Press.

Babatunde, R. O., & Qaim, M. (2010). Impact of Off-Farm Income on Food Security and Nutrition in Nigeria. *Food Policy, 35*(4), 303-311.

Ebel, R. L., & Frisbie, D. A. (1986). *Essentials of Educational Measurement* (4th ed.). New Jersey: Prentice-Hall.

Nunnally, J. (1978). *Psychometric theory*. New York: MacGraw-Hill.

Radermacher, H., Feldman, S., & Bird, S. (2010). Food security in older Australians from different cultural backgrounds. *Journal of Nutrition, Education and Behavior, 42*(5), 328-336.

Examples of Translated Thai References

Prachason, Sajin. (2009). *The Development of Food Security Indicators*. Sustainable Agriculture Foundation (Thailand).

Agricultural Land Reform Office. (2009). *Annual Report*. Maha Sarakham: Apichart Press.

Ministry of Agriculture and Cooperatives. (2005). *The Results of the Thailand Analysis*. Retrieved October 10, 2008, from Website http://www.asiafivims.net/thailand/fivims/analysis.htm

Research Articles

Introduction elaborates on the importance of problems, scope of research, assumptions (if applicable), document checking may be included.

Objectives are objectives of the research.

Literature Review or Document Checking involves synthesizing the content from related literature and research to present concepts, theories, and information related to the research.

Methods specify methods to compile data, time used to compile data, year of research, methods of data analysis, whether qualitative or quantitative, depending on the type of research.

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Book Reviews

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