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NIDA Development Journal
วารสารพัฒนบริหารศาสตร์

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Aims and Scope

The NIDA Development Journal (NDJ) publishes manuscripts that describe or synthesize research of direct relevance to development administration. Its main objective is to publish high quality, peer-reviewed papers using at least two referees that have not previously been published and that reflect the latest research in the area of policy, administration and development. The editors welcome a wide range of academic papers, including research articles, review articles, and book reviews.

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Message from the Editor

Dear Readers,

The volume 2/2019 promises many exciting developments for the NIDA Development Journal (NDJ). This volume of NIDA Development Journal (NDJ) brings even more pioneering research content. The six original studies that follow address a variety of significant development management and research topics in international and domestic development management and sustainability, including Development of an ELearning Model to Facilitate Internal Communication; Livelihoods Strategies of Peasant and Indigenous Variety Rich Situation in Globalization; Predictive Price Model for Buy-Sell Bitcoin; Bitcoin Investment Behavior in Thailand; Structural Issues Confronting China's Third-front Resource-based Cities during the Period of Industrial Transformation: A Case Study of Panzhihua City; and Structural Patronage in Thailand: A Decade of Power Struggle and Problematic Issues in Governance with Regards to The Thai Local. You can use https:/www.tci-thaijo.org to access the six papers.

As a means of disseminating research findings to development management researchers who are actively attempting to improve the efficiency of their studies, the NIDA Development Journal (NDJ) plays an important role in this endeavor.

I would like to express my heartfelt gratitude to the scholars on the editorial board of The NIDA Development Journal, as well as to those in the editorial office, for their collaborative effort and contribution to the journal (NDJ). It had a significant impact on the content of our published papers, and in many cases, the insightfulness of the reviews conducted for the journal had a significant impact as well. Our priority will continue to be the publication of high-quality research papers that will assist researchers in development management fields in managing the innovative development of contemporary organizational management in their respective fields. Our authors have worked tirelessly to produce their work, and I would like to express my appreciation for selecting The NIDA Development Journal (NDJ) as their preferred journal. We look forward to The NIDA Development Journal (NDJ) continuing to provide Thailand with an academic voice and a forum for expression, both management- and intellectual-related, that will propel us forward steadily.

Wariya Lamlert
Managing Editor

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Contents

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Research Articles:

Development of an eLearning Model to Facilitate Internal Communication

Duangta Duangekanong* and Poonsri Vate-U-Lan**

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Abstract

The goal of this research was to develop a conceptual model for eLearning as a supporting tool for business process management. A mixed methods case study was used to evaluate and test an eLearning model in a case study firm. The case study focused on internal communications processes and procedures, which was a specific issue of the case firm. The eLearning model was developed through a combination of preliminary testing and expert review, which identified eight eLearning characteristics that ultimately led to process knowledge (internal communications effectiveness) through perceived usefulness, user satisfaction and knowledge transfer. Following an organizational training intervention, the model was retested. This retesting demonstrated that the conceptual framework reliably measured internal communication effectiveness. The implication of these findings is that eLearning is an effective tool for supporting business process management and that specific characteristics of eLearning influence training outcomes.

Keywords: eLearning, Internal Communication, Organizational Change

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การพัฒนารูปแบบการเรียนรู้แบบอีเลิร์นนิ่ง เพื่ออำนวยความสะดวกในการสื่อสารภายใน

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อพัฒนารูปแบบแนวคิดสำหรับอีเลิร์นนิ่งซึ่งเป็นเครื่องมือสนับสนุนสำหรับการจัดการกระบวนการทางธุรกิจ การวิจัยครั้งนี้ใช้กรณีศึกษาแบบผสมเพื่อประเมินและทดสอบแบบจำลองการเรียนแบบอีเลิร์นนิ่งในองค์กร กรณีศึกษานี้มุ่งเน้นกระบวนการและขั้นตอนการสื่อสารภายในซึ่งเป็นประเด็นเฉพาะขององค์กร กรณีศึกษา รูปแบบการเรียนรู้แบบอีเลิร์นนิ่งได้รับการพัฒนาโดยการรวมการทดสอบเบื้องต้นและการตรวจสอบโดยผู้เชี่ยวชาญซึ่งระบุลักษณะพิเศษด้านการเรียนรู้แบบอีเลิร์นนิ่งแปดข้อซึ่งนำไปสู่ความรู้ด้านกระบวนการ (ประสิทธิภาพในการสื่อสารภายใน) โดยการรับรู้ประโยชน์ความพึงพอใจของผู้ใช้และการถ่ายทอดความรู้ หลังจากการฝึกอบรมให้กับทางองค์กรแบบจำลองได้ทำการทดสอบอีกครั้ง การทดสอบอีกครั้งนี้แสดงให้เห็นว่ากรอบแนวคิดสามารถวัดประสิทธิภาพการสื่อสารภายในได้อย่างน่าเชื่อถือ ผลของการค้นพบนี้ คืออีเลิร์นนิ่งเป็นเครื่องมือที่มีประสิทธิภาพในการสนับสนุนการจัดการกระบวนการทางธุรกิจและลักษณะเฉพาะของผลการฝึกอบรมที่มีอิทธิพลต่อการเรียนรู้แบบอีเลิร์นนิ่ง

คำสำคัญ: อีเลิร์นนิ่ง การสื่อสารภายใน การเปลี่ยนแปลงขององค์กร

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Introduction

Every firm has periods during its lifecycle in which substantial growth and change take place, and in which the firm may become vulnerable to external factors which force this change (Phelps, Adams, & Bessant, 2007). During these periods, the firm needs to ensure that employees have sufficient information about the changes and the firm's position to remain committed and loyal, since otherwise employees may leave or may not provide sufficient energy to sustain the change (McCalman, Paton, & Sibert, 2015). One of the tools for managing communication about change during these critical interstitial periods is internal communication, or the practice of communicating within the firm about organizational processes and changes, key issues, and successes and failures (Mazzei, 2014; Verčič, Verčič, & Srirahmesh, 2012; Welch & Jackson, 2007). Although internal communication is a relatively new concept, it has undergone substantial change over its short period of existence. While early models of internal communication positioned the process as an internal marketing activity dedicated mainly to public relations-like, one-way communications (Cornelissen, 2004), more recent models such as those proposed by Mazzei (2014) and Welch and Jackson (2007) promote internal communication as a two-way, organization-wide practice. This broader perspective on organizational communication provides more room for development of employee engagement and organizational learning from the communications process. Unfortunately, much research into internal communication continues to focus on a managerial perspective and does not acknowledge the importance of bottom-up, horizontal, and informal internal communication (Verčič, et al., 2012). This means that the effectiveness of internal communication as a business process has also been neglected in the literature, and it is still considered mainly as a management communication process (Yates, 2006).

The purpose of this study is to apply eLearning as a tool for internal communication development within the organization. The research was conducted as a case study of a large furniture manufacturing firm in Thailand. This family firm was established in 2005, and has grown rapidly since then due to a dramatic increase in export demand for its products. The firm has undergone a five-year growth of about 144% in terms of employee numbers, which has strained the internal communications structures of the firm. The needs assessment interviews with managers revealed a situation where formal communications

are top-down and centralized, and where employees often resist engaging in bottom-up or horizontal communication (whether formal or informal). This situation is exacerbated by lack of training on the part of both managers and line workers, and it has already resulted in some significant production errors and other issues that could have been prevented with more effective internal communication. This research applied eLearning as a tool for the entire organization to learn about their role in effective internal communication. The study used an existing eLearning system that was deployed in the company three years ago, but to date has not been used widely for frontline employee training. Instead, it has been reserved for managerial training. This research was the first use of the eLearning system for shared organization-wide training.

Literature Review

eLearning

eLearning has been defined in different perspectives over time, including technology-based definitions, learner-oriented definitions, and interdisciplinary definitions, and which have different perspectives on technology (and changing technologies) and the role of formal and informal learning (Arkorful & Abaidoo, 2015). One of the most basic such definitions is that eLearning is "training delivered via network technology, where training refers to planned efforts to increase job-related knowledge and skill (Welsh, Wanberg, Brown, & Simmering, 2003, p. 246)." Another definition is that eLearning is "the activities and processes through which individuals acquire knowledge, skill, and attitudes by using various digital tools (Tsai, 2009, pp. 40-41)." Technological changes mean that eLearning needs to consider the role of informal learning, which is increasingly predominant (Arkorful & Abaidoo, 2015). For the purposes of this study, eLearning is defined as *the use of online communication technologies to facilitate the acquisition of knowledge, skills, and attitudes by learners in a formal training process through transmission of knowledge and opportunities to communicate and exchange information between teachers and learners*, following Arkorful and Abaidoo (2015) and Tsai (2009). eLearning draws on theories of learning such as cognitive flexibility (Cañas, Fajardo, & Salmeron, 2006) and discovery learning (Daniels, 2014) to develop an environment in which individuals can learn effectively. ELearning is frequently used in organizations to meet training requirements and improve organizational learning both on job-specific

(hard) skills and general (soft) skills (Clark & Mayer, 2016).

Some of the key internal communication structures include the use of internet, for team communication. Another structure used for the internal communication include the development of a team network by understand the issues. The last method of structuring internal communication is making use of digital tools for a variety of reasons that vary in different organizations (Tsai, 2009)

Measuring ELearning Effectiveness

ELearning effectiveness can be measured in different ways. This research focuses on two system attitudes (perceived usefulness and user satisfaction) and one usage outcome (knowledge transfer). Perceived usefulness is derived from the technology acceptance model (TAM) (Cho, Cheng, & Lai, 2009; Liaw, 2008). It represents the system user's attitude toward how well the system can help the user accomplish required tasks. ELearning satisfaction, the second outcome examined in this research, refers to the emotional response to the system based on how well the user's needs were met (Cho, et al., 2009). These two outcomes reflect the extent to which the user views the program as useful and effective (Cho, et al., 2009). The usage outcome examined is knowledge transfer, or the user's ability to retain and apply the knowledge gained within the eLearning process (Bhuasiri, Xaymoungkhoun, Zo, Rho, & Ciganek, 2012). However, most of the studies on eLearning effectiveness focus not on knowledge management, but on user satisfaction, perceived usefulness, or related outcomes like continued use of the learning system itself (Lee, 2010). This research takes a different approach by emphasizing knowledge transfer, instead of simple system satisfaction, because this is the main goal of the training process.

How eLearning Improves Communication

eLearning is an important tool in building internal communication of a company, as it helps in communicating platform interactive (Cheng, & Lai, 2009). eLearning provides various technological tools based on the developing technology, making it easier to communicate on the go with the team mates. In addition, ELearning helps in building a strong team by assigning the tasks, and accomplishing them through various ELearning applications available on Smartphones (Lee, 2010). ELearning not only allows internal

team communication, it induces the platform where every team mate can show the progress by using various illustration tools (Cho et al., 2009). eLearning helps in the development of team members, because it is used by Apple to train the employees and use them according to the set goals of the company (Cho et al., 2009). In addition, the communication platform of the company also improves the performance because human capital can be planned and implemented accordingly.

Factors in eLearning Effectiveness

There were six characteristics of the eLearning system that were initially identified as significant factors in satisfaction, including user interface, learning community, system content, personalization, system operation, and expectance confirmation. The strongest evidence for these factors was that they contributed directly to user satisfaction and perceived usefulness. The conceptual framework was built on the relationship of these factors to the above outcomes and the outcomes' relationships to each other.

User interface. The user interface refers to the extent to which the eLearning system is stable, user-friendly, and easy to use and understand (Shee & Wang, 2008). Cho, et al. (2009) found that the user interface had a direct effect on perceived usefulness. Given the known relationship between perceived usefulness and user satisfaction (Cho, et al., 2009), this research extends the potential effect of the user interface to user satisfaction as well, stating that:

- Hypothesis 1: User satisfaction is influenced by the user interface.
- Hypothesis 7: Perceived usefulness is influenced by the user interface.

Learning community. Learning community refers to the ability to interact, share materials and engage with other members of the course, including instructors and other students (Shee & Wang, 2008; Wang, 2003). These authors found that the learning community had a significant effect on user satisfaction. This effect is extended to perceived usefulness, indicating the following two hypotheses:

- Hypothesis 2: User satisfaction is influenced by the learning community.
- Hypothesis 8: Perceived usefulness is influenced by the learning community.

System content. System content and similar constructs refer to the learning materials and supports available on the system for learner use (Shee & Wang, 2008;

Siritongthaworn & Krairit, 2006; Wang, 2003). System content should be up to date, relevant, and useful to be effective for learners and to influence user satisfaction (Shee & Wang, 2008). This study also examines the role of system content in perceived usefulness, resulting in the following two hypotheses:

- Hypothesis 3: User satisfaction is influenced by the system content.
- Hypothesis 9: Perceived usefulness is influenced by the system content.

Personalization. Personalization refers to the ability to adapt the system to the learner's specific needs (Wang, 2003). A few studies have examined the role of personalization in learner satisfaction (Shee & Wang, 2008; Wang, 2003). These studies have found that personalization does affect user satisfaction. This study extends this finding to perceived usefulness as well, hypothesizing:

- Hypothesis 4: User satisfaction is influenced by personalization.
- Hypothesis 10: Perceived usefulness is influenced by personalization.

System operation. System operation refers to the technical features of the system, such as system speed, mode of access, and reliability and uptime characteristics (Siritongthaworn & Krairit, 2006). These authors found that system operation, especially reliability and speed, influenced user satisfaction with the eLearning system. Extending these results in keeping with Cho, et al.'s (2009) findings, this study proposes that:

- Hypothesis 5: User satisfaction is influenced by system operation.
- Hypothesis 11: Perceived usefulness is influenced by system operation.

Expectance confirmation. The final factor considered is expectance confirmation, or the extent to which the user's expectations of the system quality, information quality, and service quality have been met (Holsapple & Lee-Post, 2006; Lee, 2010). Expectance confirmation stems from expectancy confirmation theory, which argues that user satisfaction is determined by the extent to which a system fulfills or exceeds their expectations from previous experience and knowledge (Lee, 2010). This study extends the finding to include perceived usefulness:

- Hypothesis 6: User satisfaction is influenced by expectance confirmation.
- Hypothesis 12: Perceived usefulness is influenced by expectance confirmation.

Process Outcomes

Key process outcomes include knowledge transfer and perceived internal communication effectiveness.

Knowledge transfer. Knowledge transfer refers to the retention and use of knowledge transferred by the eLearning process (Arkorful & Abaidoo, 2015). Since the intended goal of eLearning is knowledge transfer, it is proposed here that user satisfaction and perceived usefulness will facilitate knowledge transfer. This question is difficult to answer directly from the literature review, since most research on eLearning that was reviewed does not focus on knowledge transfer, but instead emphasizes system use as the main outcome (Arkorful & Abaidoo, 2015). This study proposes that both user satisfaction and perceived usefulness will influence knowledge transfer.

- Hypothesis 13: Knowledge transfer is influenced by user satisfaction.
- Hypothesis 14: Knowledge transfer is influenced by perceived usefulness.

The intended final outcome of this study is perceived internal communication effectiveness, which is proposed in this research to be directly influenced by knowledge transfer. This hypothesis is stated as follows:

- Hypothesis 15: Perceived internal communication effectiveness is influenced by knowledge transfer.

eLearning and Process Outcomes

The goal of this research is mainly to evaluate the effect of the eLearning process on internal communication effectiveness perceptions. There has been very little research on this topic, with most such studies only noting that tools like intranets or social media can be used for both eLearning and internal communication (Bottazzo, 2005; El Ouirdi, El Ouirdi, Segers, & Hendrickx, 2015; Hearn, Foth, & Gray, 2009). Thus, this is an area where there is not much research. The case study environment is such that many of the training participants have not encountered the eLearning system previously, since while it has been deployed in the case firm it has mainly been used for management training. This study proposes that the eLearning model implementation as deployed in the case study firm will influence user satisfaction and perceived usefulness with the eLearning system. Additionally, knowledge transfer will be improved, as will perceived internal

communication effectiveness. These final hypotheses are stated as follows:

- H16: There is a significant positive difference in user satisfaction after eLearning model implementation.
- H17: There is a significant positive difference in perceived usefulness after eLearning model implementation.
- H18: There is a significant positive difference in knowledge transfer after eLearning model implementation.
- H19: There is a significant positive difference in internal communication effectiveness after eLearning model implementation.

Conceptual Model

A draft conceptual model was prepared from the literature (Figure 1). This draft conceptual model represents the expected relationships uncovered at the time of the literature review.

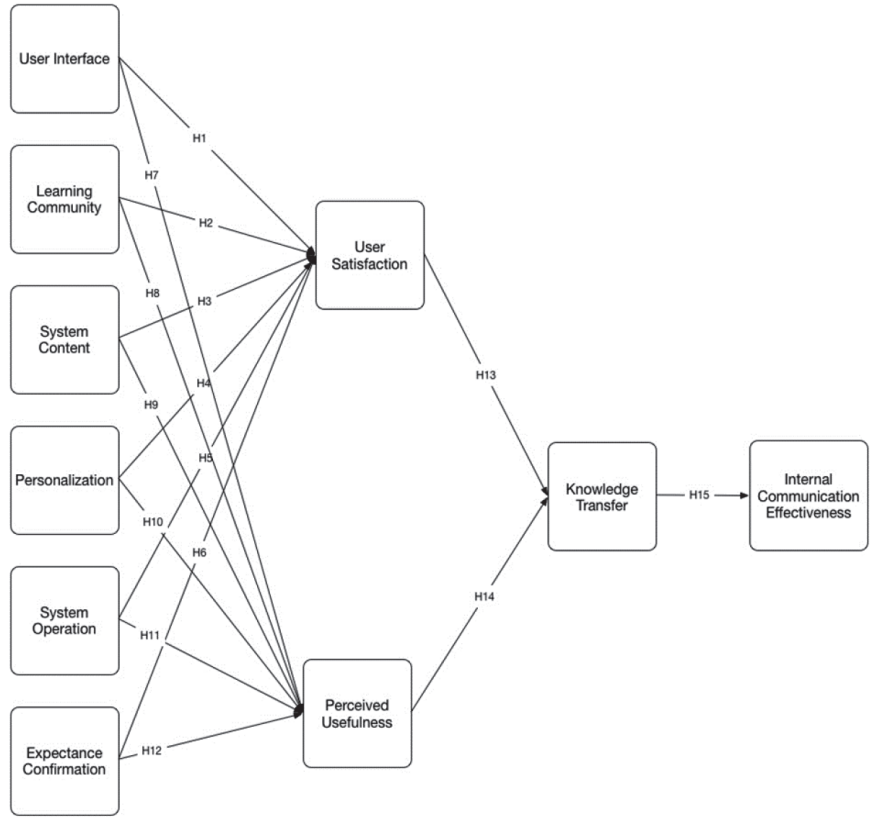

Figure 1: Draft Conceptual Model

Methods

The study used a mixed methods approach to refine the draft conceptual model, implement organizational eLearning on internal communication, and evaluate the effectiveness of the training. Quantitative research was designed as a pre-test/post-test study. The pre-test phase was conducted prior to implementation of the eLearning intervention. A pre-test questionnaire evaluated the draft conceptual model in a census sample of the case firm's employees (n = 309). The findings were analyzed using a series of multiple and single regressions, evaluated at $p < .05$ for significance.

The findings of the pre-test were used as the basis for review of the draft framework, which draw on a focus group panel of subject matter experts (n = 3). The goal of the expert review was to identify potentially missing factors in the conceptual model and add them. Following expert review and revision of the conceptual model, additional items were added to the questionnaire to measure key constructs.

The eLearning intervention was implemented over a period of three months during 2017. During this period, all organizational employees undertook the internal communications training. Non-managerial employees were assigned a series of three workflows, including training on the eLearning system, the basics of internal communication, and two-way internal communication. Managerial employees were assigned an additional four workflows with advanced topics.

The post-testing questionnaire was distributed on completion of the eLearning process for each department. Post-testing results were generated using the same process as the pre-testing results, including single and multiple regression. Paired t-tests were used to test hypotheses 16 through 19 (mean differences following the learning process).

Findings and Discussion

Pre-testing

The pre-testing questionnaire was analyzed using single and multiple regressions to test the first 15 hypotheses. All 15 hypotheses were accepted at this stage. Table 1 summarizes the regression tests conducted at this stage. As this table shows, the strongest effects on both US and PU were from EC and SO. Both PU and SU had a significant strong effect on KT, which in turn had a significant effect on ICE.

Table 1: Pre-testing Regression Models

	Model 1 (US)	**Model 2 (PU)**	**Model 3 (KT)**	**Model 4 (ICE)**
	H1-H6	H7-H12	H13-14	H15
R	.856	.861	.898	.845
R Square	.732	.741	.807	.715
Adj. R Square	.727	.736	.806	.714
S.E.	.374	.367	.308	.367
F	147.401	144.072	640.738	768.612
Sig.	***	***	***	***
Coefficients				
UI	.134***	.132***		
LC	.151*	.160*		
SC	.099*	.102**		
P	.098*	.089*		
SO	.210**	.205**		
EC	.369***	.378***		
US			.432*	
PU			.468*	
KT				.829***

Note: * p < .05 ** p < .01 *** p < .001

Expert review and finalization of conceptual model

The expert review process generally supported the reliability of the draft conceptual model. Suggestions for improvement resulted in two additional factors, User Friendly and Training. These two factors were added for evaluation in the post-testing process. Figure 2 shows the final conceptual model.

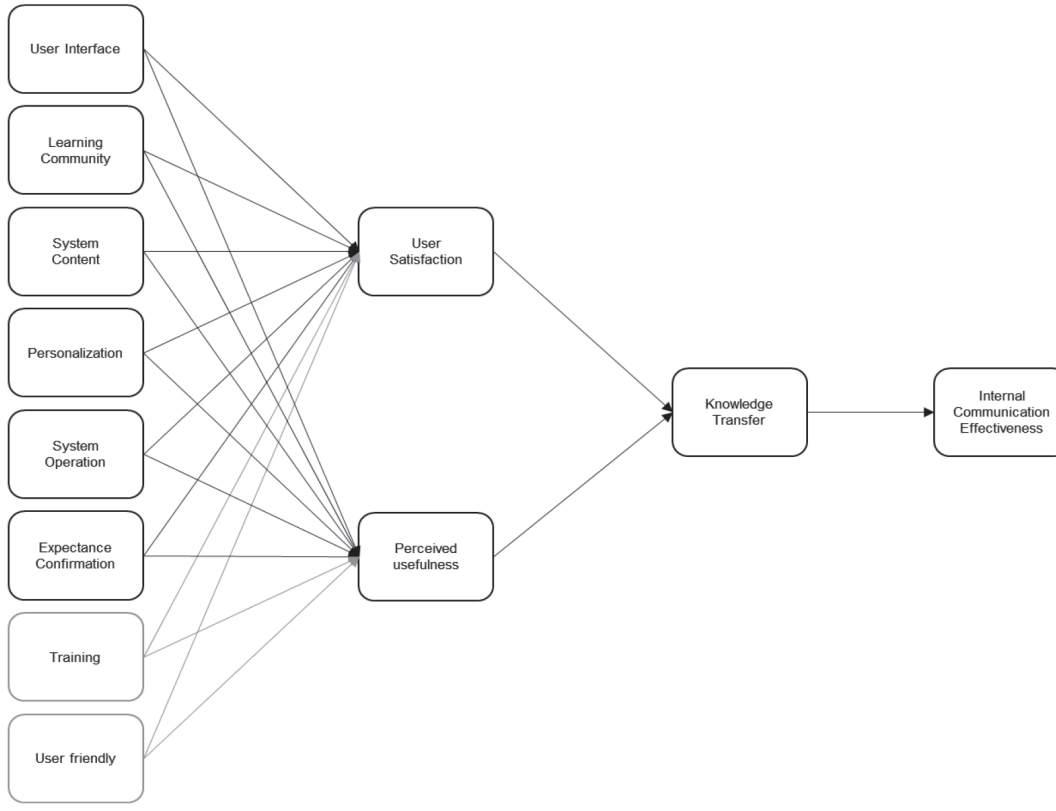

Figure 2: Final Conceptual Model

Instrument Reliability

Table 2 summarizes the alpha coefficients. All items passed a < .7, indicating appropriate reliability for this study.

Table 2: Pre-testing Scale Reliability (Cronbach's Alpha)

Scale	α
User Interface (UI)	.861
Learning Community (LC)	.846
System Content (SC)	.815
Personalization (P)	.779
System Operation (SO)	.915
Expectance Confirmation (EC)	.938
User Satisfaction (US)	.894
Perceived Usefulness (PU)	.886
Knowledge Transfer (KT)	.725
Internal Communication Effectiveness (ICE)	.710
Training (T)	.853
User Friendly (UF)	.750

Testing of Final Conceptual Model

Only the first two stages of the model (Hypotheses 1 through 12) were tested during the post-testing phase, along with the effects of the new variables of UF and T (Table 3).

Table 3: Post-testing Regression Models

	Model 1 (US)	**Model 2 (PU)**
	H1-H6	H7-H12
R	.880	.886
R Square	.774	.785
Adj. R Square	.768	.780
S.E.	.345	.335
F	128.630	137.256
Sig.	***	***
Coefficients		
UI	.076*	.072*
LC	.179*	.190*
SC	.077*	.080*
P	.093*	.084*
SO	.148*	.142*
EC	.350***	.358***
T	.131**	.131**
UF	.121**	.126**

Note: * p < .05 ** p < .01 *** p < .001

Hypotheses 15 through 19 were tested using paired t-tests (Table 4). These tests showed positive mean differences during the post-eLearning stage, allowing acceptance of these four hypotheses.

Table 4: Paired Samples T-tests (Outcome Evaluation)

		Mean	S.D.	Mean Difference	S.D.	t
Pair 1	Pre US	2.9741	.71576	-.37109	.68351	-9.544***
	Post US	3.3452	.75368			
Pair 2	Pre PU	2.9763	.71382	-.37325	.67060	-9.784***
	Post PU	3.3495	.71982			
Pair 3	Pre KT	3.0043	.69991	-.38727	.67471	-10.090***
	Post KT	3.3916	.70367			
Pair 4	Pre ICE	2.9881	.68603	-.34088	.70117	-8.546***
	Post ICE	3.3290	.75305			

Note: * p < .05 ** p < .01 *** p < .001

Discussion

The findings of the study confirmed that the characteristics of the eLearning system influence perceived usefulness and user satisfaction, which in turn influence knowledge transfer and internal communication effectiveness perceptions. This finding supports the idea that eLearning has an influence on knowledge transfer and process outcomes, which is one of its core characteristics (Arkorful & Abaidoo, 2015). The findings also support other studies, which have demonstrated that eLearning characteristics influence outcomes like perceived usefulness and user satisfaction (Cho, et al., 2009; Holsapple & Lee-Post, 2006; Venkatesh, & Davis, 2000; Lee, 2010; Liaw, 2008; Shee & Wang, 2008; Siritongthaworn & Krairit, 2006; Wang, 2003). The study also supported the role of the eLearning system in knowledge transfer (Arkorful & Abaidoo, 2015; Bhuasiri, et al., 2012). Where this study has contributed is in two areas. First and most importantly, it demonstrated the utility of eLearning for internal communication, showing that eLearning could help develop knowledge and understanding of internal communication processes and perceptions of their effectiveness within the organization. This finding supports the role of eLearning in internal communication, which has not been studied previously; instead, previous studies have only superficially connected the two concepts. The second contribution of this study is demonstrating the consistency of the effect of eLearning on different system-related outcomes, including perceived usefulness and user satisfaction.

These findings were suggested by Cho, et al., (2009), who had previously observed consistency between factors in user satsifaction and perceived usefulness as well as a relationship between them. The final contribution of this research is the development of a conceptual model that integrates different characteristics of the eLearning system to achieve business process management outcomes like internal communication changes. This model drew on several previous models (Shee & Wang, 2008; Siritongthaworn & Krairit, 2006; Wang, 2003), and the input of expert reviewers with experience in organizatioanl eLearning, creating an interdisciplinary perspective on the characteristics of eLearning and their role in ultimately ensuring organizational outcomes. While this model does need to be tested in other organizatioanl contexts, it represents an advance in understanding of the role of eLearning in organizational training.

Conclusion

In conclusion, this research has demonstrated that eLearning is effective at implementing organizational objectives like business process changes. This is critical for organizations like the case company, which are undergoing rapid organizational changes due to rapid growth or market changes and which require rapid adaptability. However, eLearning could also be used to support more routine organizational changes and provide all employees with a better understanding of the organization's business processes and goals. The implication of this finding is that firms cannot afford to ignore the benefits of eLearning or limit the use of such training to only supervisors and managers. Ultimately, a well-designed eLearning system could not just support job-related skill development, but also contribute to the human capital development of the firm's entire workforce.

It is recommended that future studies should incorporate internal communication plans of the firms according to the problems faced by them. Only few studies in the literature review presented the findings by evaluating the case studies, therefore, more investigation is required in this area.

There are several limitations to this study that do need to be considered. The main limitation is that the study was conducted as a case study and only included a single organization. This requires the conceptual model derived for the study to be tested from other business process perspectives. For example, business processes such

as technical processes like manufacturing processes could also benefit from the use of eLearning. However, this cannot be confirmed with the existing study. It also means that organizational conditions may not be fully accounted for, and these conditions could influence the outcomes of eLearning. Finally, this study did not evaluate individual learner characteristics and their potential effects on learner outcomes. These limitations offer opportunities for further research and development on eLearning, including expanding the current model to consider personal characteristics and organizational characteristics and studying interactions between these factors in the conceptual model. This type of developmental research should be conducted to determine whether the proposed model is a viable framework to explain general organizational outcomes of eLearning systems.

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Livelihoods Strategies of Peasant and Indigenous Variety Rice Situation in Globalization

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Abstract

This article intended to investigate the livelihoods of peasant and the situation of indigenous variety rice in globalization: a case study of Ban Nam Yen, Kok Saton Sub-District, Dan Sai District, Loei Province, Thailand on the issue that the reduction of indigenous rice varieties reflected to the food security and community culture. The results found that the indigenous rice varieties are cultivated for consumption and distribution in Ban Nam Yen. However, due to the economic conditions that come with a globalized society, farmers were forced to reduce the indigenous rice cultivation area and change the ways in which they used the land and how they cultivated the modified rice in the rice market. This meant that the use of indigenous

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rice variations were reduced - though there was an establishment of an indigenous rice peasant group. This has led to the transition from rice cultivation for private consumption to modern peasants in globalization society. All in all, this has devalued the indigenous rice and has caused Thai peasants to no longer be the foundation of Thai national identity. Instead, the reformed Thai economy has made Thailand a slave of commercial agriculture.

Keywords: Livelihoods Strategies, Peasant, Indigenous Rice Varieties, Globalization

ยุทธวิธีการดำรงชีพของชาวนาและสถานการณ์ข้าวพันธุ์พื้นเมืองในกระบวนการโลกาภิวัตน์

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บทคัดย่อ

บทความวิจัยนี้มีวัตถุประสงค์หลักเพื่อศึกษาวิถีการดำรงชีวิตของชาวนาและสถานการณ์ข้าวพันธุ์พื้นเมืองในกระบวนการโลกาภิวัตน์ กรณีศึกษาพื้นที่บ้านน้ำเย็น ตำบลกกสะทอน อำเภอด่านซ้าย จังหวัดเลย ในประเด็นที่ว่าการลดลงของพันธุ์ข้าวพื้นเมืองสามารถสะท้อนถึงความมั่นคงทางอาหารและสะท้อนถึงวัฒนธรรมของชุมชน ผลการศึกษาที่ได้ คือ บ้านน้ำเย็นเป็นชุมชนชาวนาที่มีการปลูกข้าวพันธุ์พื้นเมืองไว้บริโภคและจำหน่าย แต่สภาวะเศรษฐกิจในสังคมโลกาภิวัตน์บีบคั้นให้ชาวนาต้องลดพื้นที่เพาะปลูกข้าวพันธุ์พื้นเมืองเพื่อนำที่ดินทำกินไปใช้ประโยชน์รูปแบบอื่น และนำพื้นที่เพาะปลูกข้าวที่มีอยู่ใช้ในการเพาะปลูกข้าวพันธุ์ปรับปรุงซึ่งเป็นที่นิยมของตลาดข้าว จึงทำให้เกิดการลดลงของการใช้ข้าวพันธุ์พื้นเมืองที่ถึงแม้จะมีการจัดตั้งกลุ่มผู้ปลูกข้าวไร่ข้าวพันธุ์พื้นเมืองก็ตาม การปรับเปลี่ยนจากชาวนาชนบทที่เน้นการเพาะปลูกเพื่อยังชีพแบบผสมผสาน

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เป็นชาวนาสมัยใหม่ในสังคมโลกาภิวัตน์ที่เน้นการเพาะปลูกเพื่อเป็นผู้ประกอบการได้ส่งผลให้เกิดการลดทอนคุณค่าข้าวพันธุ์พื้นเมือง อีกทั้งยังทำให้เกษตรกรไทยไม่ได้ตั้งอยู่บนรากฐานของความเป็นไทยและการใช้ภูมิปัญญาของไทยอีกต่อไปโดยกลับกลายเป็นทาสของระบบเกษตรกรรมเพื่อการพาณิชย์

คำสำคัญ: ยุทธวิธีการดำรงชีพ ชาวนา ข้าวพันธุ์พื้นเมือง โลกาภิวัตน์

1. Introduction

The beginning of the Thai rice industry was marked by the green revolution. This ultimately transitioned the rice industry from being based on indigenous rice to relying on modified rice. Lianjamroon (2011) explained that Thailand began changed from diversified subsistence farming to commercial farming. This developed the country under the first National Economic and Social Development Plan on 1961 along with the establishment of the International Rice Research Institute (IRRI) at Philippine by support of the United States. In addition to this, Chanta (2015) viewed that this change affected the communities and resources from promoting cash crop or monoculture of mainstream agriculture that began during the green revolution era. This lead to the development of various varieties that were aimed to meet the market needs with state and private sector mechanisms. They sought to determine the appropriate characteristics of the plant variety, promote the production which subsequently caused the reduction of genetic diversity including: engineering editing, genetic characteristics of seeds, and efforts to plant those in the farm. The exchange of plant genetic and knowledge of peasants have never been independent from control, but the mechanisms of state power and market system has lead to the monopoly in plant and rice varieties. This has caused the varieties of rice to be modified in order to make plants suitable for various locations. A as a result, the peasants have had to plant crops and rice under the market needs and reduce the planting of certain crops that are unwanted by market. Therefore, a diversity of rice varieties is reduced, which has lead to the risk of genetic and biodiversity loss.

The consequences of the green revolution included the production of agribusiness to operate within globalized society. Atthakor, W (2018) stated that the agribusiness is a “threat” to “community culture”. The “green revolution modern culture” had removed the community rights and destroyed the local wisdom of agriculture that builds cultural security and self-reliance of various communities in Thai society. This includes the development of quality indigenous rice-both of which are foods and herbs. The monoculture reduces a role of local wisdom by reducing the self-reliance of community and restricting them from developing their local knowledge. Vandergeest, P. (2014) therefore proposed the alternative agriculture as a solution for those peasant communities who suffer the problems of capitalism. He stated that the alternative agriculture has received more and more attention. The alternative agricultural concept

is a critique to the green revolution. The concept argues that the green revolution has been responsible for a food shortage, new varieties planting and the use of agricultural chemicals. This has ultimately led to peasants being in financial debt, as well as an array of environmental problems. The alternative agriculture has proposed the following solutions: integrated agriculture, agroforestry, natural agriculture, organic agriculture, the SRI (the system of rice intensification) and IPM (integrated pest management). This is a guideline for pest management and permits the use the chemicals in exceptional occasions. For example, when there are many outbreaks, in order to fight with the cash crops by promoting and expanding the "Prototype peasants" or "Prototype peasant groups" to be the leaders in alternative agriculture and share knowledge together.

In the provinces of Ban Nam Yen, Kok Sathon Sub-District, Dan Sai District and Loei indigenous rice would also be organically organically. The process started from selecting the seeds, preparing the lands, cultivating, harvesting and taking care of the rice. Natural and traditional methods were implemented in every step. Although in Ban Nam Yen, some agricultural techniques were applied in order to increase the quality of the yield. For instance, Effective Microorganisms were used to take care of the paddy. This can be seem as a method of transitioning the indigenous rice. In addition to this, the method may positively benefit the health of people as well as not causing harm to the environment. Organic indigenous rice cultivation in Ban Nam Yen relied on the 'natural' approach of cultivating rice. This meant that no toxic waste would contaminate the soil, water or air. This was to enhance the abundance of the soil and the ecological diversity in the ecology system. Moreover, this 'natural' approach can also restore the environment and the balance of the nature.

Therefore, as mentioned above, this article is interested in the social issues occurred during the green revolution in the global society. It has distributed a set of knowledge and innovation to the community. However, people in Ban Nam Yen can still live by cultivating the indigenous rice, which is considered an alternative agricultural method. This article also inetnds to investigat factors affecting Ban Nam Yen people to change their livelihood. Moreover, it also aims to examine the usage of monoculture and how the process of globalization has affected the peasant community, their livelihoods and the indigenous rice cultivation in the community.

2. Objectives and Approaches

This article aimed to study the livelihood of peasants and the situation of indigenous rice in globalization: a case study of Ban Nam Yen, Kok Sathon Sub-District, Dan Sai District, located in the western border of Loei Province and is a part of the northeastern region of Thailand.

The study has used the qualitative research as a guideline. The field survey and data collection focused on in-depth interviews, observations and group discussions. The data collection instruments consisted of an interviews, observations, group discussions and various activities obtained in the field. The sample was comprised of 35 households that cultivated the indigenous rice at Ban Nam Yen and 180 households that were the community leaders. The details are as follows:

The Sample Group

1. The leaders and the committee of indigenous rice group
2. 35 households cultivating the indigenous rice at Ban Nam Yen who were selected by a purposive sampling method.

Research Instrument

1. Structured interviews were implemented because the study focused on in-depth discussions with participants in order to get accurate answers. In addition to this, structured interviews were used so that the interviewer would have a clear guideline during the process and would not go off topic. The structure of the interview was planned in advance before collecting the data.

2. Observation, participation observation and direct observation were used. For example, if the sample group was at home, the agricultural tools around their house would be observed. If the sample groups were at the rice plot, they would be observed on what were doing.

Data Collection

The researchers visited and surveyed the community in order to become familiar with the people in the community before collecting the data. During the data collecting

process, the researchers were guided by a local who they met at a local grocery shop. The researchers visited the community four times before collecting the data in order to become accustomed with the community. The language was not a problem during the data collection process. Moreover, the survey was conducted on the analysis of the area and the analysis of the possibility to study. The details of other procedures are as follows:

1. The interview form and the observation form were made and submitted to the experts. After that, they were amended accordingly.

2. The interview was conducted based on the objectives of the study. The interview form was examined by the experts and the researchers have amended the information accordingly. Moreover, participation observation and direct observation were conducted. The observation would be used to discuss, along with the results of this study. The data was distributed to the participants in order to amend, improve and complete the information.

3. Finally, the researchers summarized, analyzed and synthesized the data based on the objective of the study. The data were used to discuss together with related concepts, theories, and other pieces of research. This was done in order to identify the relationship of this study with others. The differences of this study would be identified as the new body of knowledge.

3. Review the Concept of Livelihoods Strategies of Peasant

The popularity of livelihood concepts, both on concepts and policies level, arose under the academic atmosphere of the social science development in the 20th century. This reviewed the classical conceptual theory regarding alternative economies. Changes in peasant society has become a contemporary trend for seeking the answers to economic and livelihood deadlock under liberal capitalism. This includes Karl Polanyi's institutional economics concept in job analysis on development as well as applying the cultural economics concept for livelihood analysis or revival The Agrarian Question of Karl Kautsky. Laungaramsri (2011) further explained that the return of debate on the peasant society has an important issue, namely the complexity on the relationship between peasant society and postmodern society or space of peasants in globalization

era. (Laungaramsri, 2011) focused on decision making and strategy selection of peasants, especially the household as an actor. In addition to this, the study of the livelihoods strategies of peasant must be considered along with the rural livelihood conceptual framework on the issue of vulnerability context. This is the context of environmental condition that the poor lives and affects the status of household resources or facing the risks or pressures that may affect the food security consisted of the trends such as population trends, resource management trends in the event of Shocks such as natural disasters, illnesses and seasonality such as seasonal crops, etc. Kollmair, M. and Gamper, S. (2002) had also developed an approach of the livelihood concept study through various capitals in society. The Department of Foreign International Development (DFID) had developed and implemented in various research projects by suggesting that the heart of livelihood is at the people. The strength of people was referred to as "capital" or "resources". Because the potential of people is an important foundation for development of both themselves and the community. Therefore, it is important for analyzing the way that people transform the resources. Positive outcomes for livelihood required many forms of resources which are unnecessary to be in the form of private ownership regime, Instead they may be suited to be in the form of collective ownership, such as the relationship between various resources and dynamics of resources.

For Thailand, Santasombat (2003) described the livelihood strategy as "the flexible peasant". This essentially viewed that 19th century peasant society in the third world countries had to face more external pressure when the Western powerful countries. They paid attention to and needed foods and agricultural products from the third world countries more and more. The colonialism enabled these local economies to be integrated into the world economy quickly. Peasants in various areas of Thailand, Myanmar, Vietnam, Malaysia, Indonesia, Philippine including Latin America and certain parts of Africa began to enter into production for sale along with the subsistence production system as a result the peasants have to create a learning process about the properties of various varieties, modify and develop the plant varieties to suit for the physical diversity. In addition to the learning how to modify crops based on their physical characteristics, this community learns new beliefs, rituals, community culture.

Pintobtang, P. (2015) proposed the "Subsistence Crisis" of rural people in globalization era by analyzing the changes in current rural community. It was found that the villagers

adapted oneself by accepting the modern production technology and relying on the currency-based economy deeply. They were intensive and complex involved in commercial agricultural system. The rural people then became a new generation with multi-dimensional adaptations. They were not just semi-labor peasants, but they also had the culture of consumption, acknowledgement of political news. This made them not so different from the middle class in the urban area. However, because rural people possess small size of land, high production costs, low agricultural prices and high household expenses according to the modern consumption culture resulting they were pushed to "drown" or "choke" due to the problems of subsistence crisis. The "subsistence crisis" of rural people in this era was able to create the "subsistence security". That was a way of life that bound with a market economy resulting in disintegration within a community with various groups or organizations. Leaders participated into political activities both in the community and national politics and related with external politics, acquisition of security or guarantee of the livelihood of rural people, they were therefore related to the political areas, elections, policies of political parties politicians, and etc. that formed as a new kind of social relationship and made people ends meet.

According to the research conducted worldwide, Gladwin, C. et al. (2001) studied the livelihoods strategies to solve food security problems in African households. This was done through the variety strategies of female peasants as food insecurity was one of the most critical problems among low-income households and food production policies in Africa was unstable. Even though African peasants aimed to supply sufficient crops, they seemed to have unsatisfied returns. For this reason, the government should have a method to improve more yields for rural agriculture. The method may also include the opportunities for non-farming and farming labors. However, the African female peasants - also known as the main food producers, attempted to do various jobs in order to reduce the stress for their families. The agricultural jobs that increased their income were developed through cash crops farming, bean cultivating and non-farming careers that were impossible for women. However, in the African society, the breadwinner was still the men's role and income or money was still their main responsibility. During this time, rural women had used a variety of livelihoods strategies that suited the environment, resources and household factors. Nevertheless, some might be able to adapt but some were unadaptable. Therefore, the author would like to propose to the main policy makers

of the country, to launch the proactive developmental policy including inequality development in order to resolve the food insecurity issues and support the policy making to generate income and create livelihoods systems in both short-terms and long-terms economic changes in Africa.

You, H. and Zhang, X. (2017) paid attention to sustainable livelihoods and sustainability in rural China. China placed an importance on the ecological safety, economic efficiency and social equality. Sustainable production and consumption in rural China were still important issues that China tried to find solutions for, especially the sustainable livelihoods of rural peasants. This group of people had not yet found healthy environments They lived in rural areas with high air pollutant emission and degraded ecological quality. It therefore affected the agricultural products in China and peasants who had low living standards and lacked the opportunities to access the resources. Hence, the Sustainable Livelihoods Index was a useful tool for determining the sustainable livelihood or the development in order to assess the security level of sustainable livelihoods of provincial peasants in China. Additionally, all three elements which were ecological abundance, economic efficiency and social equality in order to use the results to plan for improving the quality of life of rural peasants.

In summary, according to the review of the concepts related to livelihood strategies peasants in globalization, the framework for analyzing and understanding generated two approaches. The first one was the changing livelihood pattern of peasants to support the change in society and the second one was the social structural change pattern to support changes from the global society. Furthermore, the previous studies showed that it supported lifestyle and sustenance. The livelihood will be sustained when people can deal with problems or change to maintain or increase both current and future capabilities and resources. The results of the livelihood were the successes from a livelihood strategy such as more income, better mental and physical well-being, self-esteem, accessibility to various services, being integrated to be a part of the society, less fragility, more flexibility and more rights regarding resources management.

4. The Livelihood Approaches on Strategies Among Ban Nam Yen Peasants in the Globalization Era

The social changes that were manifested through globalization resulted in various local communities movement. Even in the remote communities, the changes were varied. In the case of Ban Nam Yen peasants, they not only lived in a small village far from civilization but they also lived far from the center where they communication and coordination with government agencies took place. As a result, the changes in Ban Nam Yen have been done gradually. People in the community were not aware of the changes. Due to this unawareness, people in the community had a variety of livelihoods approaches that were consistent with the community ecology. One of the interesting changes in the peasant society was the transformation of the local economic system and how it adapted in order to survive in the current society.

The Economic and Occupational Situations In addition to gathering forest products from Phu Pha Phung, a part of Phu Hin Rong Kla National Park in Phitsanulok Province, people in Ban Nam Yen mainly practiced the agriculture. The uniqueness of the community was the cultivation of indigenous rice for consumption and selling the seeds. It is widely known that Ban Nam Yen had the highest variety of indigenous rice in Loei province. As Ban Nam Yen was a peasant community located far from urban society, the community still carried the culture of indigenous rice cultivation. The culture continued to be inherited by individuals and preserved in some families even though the indigenous rice varieties were disrupted by the improved rice varieties of the capitalist economy in the globalized society. In the production year 2018 (Table 1), indigenous rice varieties cultivation according to their beliefs and popularity were demonstrated as follows.

Table 1: Lists of Indigenous Rice Varieties Cultivated at Ban Nam Yen Field

Current Indigenous Rice Varieties Cultivated		**Current Indigenous Rice Varieties Non-cultivated**	
Upland Rice	**Lowland Rice**	**Upland Rice**	**Lowland Rice**
Sew Gliang Glutinousrice	Lueng Boonma Rice	Mark Whai Rice	Mhork Rice
Leum Pua Glutinousrice		Mark Luem Rice	Rom Muang Rice
Black Glutinousrice		Mark Ku Rice	Leb Chang Rice
		Mark Sew Noi Rice	Phaya Luem Gaeng Rice
		Mark Sew Khao Rice	
		Mark Sew Dam Rice	

In addition to the upland and lowland rice cultivation of both indigenous rice and improved rice for consumption and distribution, there were also other economic crops that were cultivated to generate incomes to spend in their families. People in the village cultivated both the economic crops to serve the market needs and the economic crops stated in the farming contracts with well-known Thai companies. For instance, they cultivated pineapple for the factory in Chonburi Province. They also cultivated pepper and passion fruit for central market in Khon Kaen Province. They sold the products to the agricultural products markets such as Talad Thai Market and Si Mum Mueang Market in Pathum Thani Province. They also conducted maize cultivation or cassava cultivation. They also grew the new economic crop which was Arabica coffee. The cultivation included macadamia nut, Hong Huay Lychee, and Mon Thong durian. Moreover, there was also another economic crops from the southern part of Thailand which was rubber tree. The cultivation of the rubber tree was initiated by external capitalists from the southern part. They bought the land and then cultivated the rubber trees because of the physical characteristics of Ban Nam Yen and other villages surrounded it. This area was surrounded by high mountain area and high land between gorge. The weather was cold all year round, even in summer. Furthermore, the land price was low because it was located far from the economic sources of Loei Province. For this reason, the villagers had divided their land to sell to the capitalists and some of them were used to cultivate the rubber trees.

Therefore, when the field surveys were conducted, it demonstrated the image of rubber plantations both in and outside of communities thoroughly. This can be illustrated in the agricultural calendar of Ban Nam Yen in 2018 as follows:

Table 2: The Ban Nam Yen Agricultural Calendar, Production Year 2018

Lists	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Rice												
Maize												
Cassava												
Pineapple												
Ginger												
Pepper												
Passion Fruit												
Dragon Fruit												
Rubber Trees												

Remark 1: The pattern stands for the preparation of soil and seeds.
The pattern stands for the process of planting.
The pattern stands for the process of harvesting
The pattern stands for breaking period.

According to the analysis of Ban Nam Yen Agricultural Calendar (Table 2), it was found that the Ban Nam Yen peasants cultivated a variety of crops and allocated the harvesting time to overlap one another in order to use less labor. Moreover, this allowed the villagers to earn income throughout the year. This is a big contrast from the past. In the past, single plant cultivation only led to a lack of income while the villager were waiting for the harvest season. The adaptation into commercial crops cultivation was considered as

a livelihood strategy to tackle with living problem on their self-reliance without asking for the help from the relevant authorities. The agricultural calendar of community also indicated that during February to April, which was summer, Ban Nam Yen faced the problems of water shortage. The peasants therefore sought to find work outside the community in order to earn income for their living. Some households had altered the cultivation period and harvested other crops in order to earn more income during the dry season. For example, some households changed their maize harvesting period to after New Year or they decided to harvest the cassava from February to March. Therefore, the peasants could take a break in March and April as it was dry season and there was no water for agriculture practices. Then they started the harvesting season again in August. This demonstrated the relationship between community activities and the cultural ecology

The Social and Cultural Situations The social and cultural contexts of the community were also affected by the new economic system. This can be attributed to the villagers having more contact with external society - creating new learning networks and transformed business negotiations. These innovations sought to increase the community's communicating and living conveniences. Most importantly, the villagers could send their children to study in urban society and the children can study at a higher level through the support of their parents. According to the values of Thai society: "the children shall study as much as possible in order to become more comfortable and richer when they grow up". This way of thinking has led to the current social situation - where the villagers became more dependent to the society outside.

Furthermore, in the future, there will be a change in household labors and working values because of the important social change in Ban Nam Yen. The social change included the transition to a non-farming communities. For example, they worked as a provincial government service. They ran their personal business. They also work as industrial labor. This resulted in social burden on the youth and elderly. There must be a policy to provide the support them. Moreover, the advancement of technology in the globalized society has the potential of reducing the amount of time to acquire new knowledge through technology in the globalized society. This in turn, can open new perspectives of people in the village. As a result, people in the community are more likely to change their opinions. As a result of improved education systems, the people in the community may be more driven to treat others equally.

Another important issue is the change of community culture, in particular, the culture that was considered as the heart of community known as the Rice Paddy Ceremony. It is known be one of the largest ceremony that every household in the community would attend. (The ceremony was held in February every year). The patterns of ceremony were changed based on the community situations. This is because some peasants did not cultivate rice. As a result of this, the paddy had to change from indigenous varieties rice to modern varieties. In addition to the rice varieties, one of the most obvious changes of the Rice Paddy Ceremony was the pattern of the ceremony. In the past, the Rice Paddy Ceremony involved was a belief that harvested rice in the current year would not be consumed or sold until it was blessed. The seeds would be selected for consuming and donating to the elderly. People in the community took care of another other. The rest of the rice would be sold to the mill. The earnings from selling the rice would be used for temple renovation. Currently, the rice paddy obtained from the ceremony was sold to the mill. Nonetheless, the money earned from the selling of the rice was not enough to renovate the temple.

The Indigenous Rice Variety Situation In the past 10 years, Ban Nam Yen community was more connected to outside society because of convenient transportation and income from commercial crops cultivation. Each household had a vehicle to commute to places. Moreover, it is the era where information and technology can be accessed easily through mass communication system in globalized society. There was a flow of electronic devices. As a result, people in the community have the chance to exchange and acquire more knowledge through communicating with other peasant communities in other remote areas. Consequently, people can learn and think in a more systematical way. This also affected the occupation pattern and the decision-making regarding occupation. Furthermore, the proactive operation of the government agencies encouraged people in the community to cultivate the improved rice such as the RD 6, RD 10, and RD 12. People in the community saw the differences of the rice varieties and therefore changed the method of cultivation. They saw that the improved rice cultivation was more convenient in terms of time and labor consumption. The villagers who cultivated the modern rice varieties therefore recommended this to their neighbours. Thus, the community has changed from cultivating only the indigenous rice for consumption within household to cultivating modern rice varieties. This led to the decline of the traditional rice varieties.

According to the field survey, there were more than 10 rice varieties but there were only about 4 varieties cultivation - dividing into 3 varieties of upland rice varieties and 1 lowland rice variety (as shown in Table 1).

Based on in depth interviews and field surveys, the community leaders explained that the obvious differences of indigenous rice and modified rice are "the indigenous rice (in case of upland rice) did not require the large-scale investment. The rice can be left to grown naturally. The farmers just needed to cut some grasses. When the time comes, the rice can be harvested in harvesting season. This indigenous rice was not destroyed by insects or plant hoppers. It also provided relatively good amount of yields. However, the mills tended not to buy this kind of rice due to the narrow consumer popularity and this indigenous rice was a type of glutinous rice which was unpopular varieties in the consumer market." Moreover, its moisture differed from the modern rice. The disadvantages of this rice variety were known that it required a great number of labors for harvesting because its stems were very high. For this reason, harvester cannot be used (the harvester was modified from a lawn mower by adding the blades to more sharpen and the grilles for picking up the ear of the paddy). "But the modified rice (the villagers called Khao E Tia) required the fertilizers and chemical treatments. It was destroyed by insects and plant hoppers; however, it provided more yields than the indigenous varieties. One of its advantages was that it did not required a number of labors for harvesting because of its short stems. The rice can be harvested using the harvesters, so it did not consume much time and labors. A great number of yields can be sold to the mill." This became another income of people in the community. Both rice varieties had different advantages and disadvantages. Hence, the villagers decided to choose the different choices.

For this reason, a number of peasants decided to choose to cultivate the modified rice for consumption. This resulted in the reduction of indigenous rice varieties, including the genetics, yield amount and cultural values. The reduction of the indigenous rice variety was due to the fact that modified rice saved time and labor in every production process and the upland fields for indigenous rice cultivation became other economic crops cultivation that made more money for the household. This was consistent with Pintobtang, P (2015) who stated that the current changes in rural community enabled the villagers to adapt, by accepting modern technology and becoming fully reliant on the currency-based economy. Thus, the rural people became the new generation that

is adaptable. Similar to the current study, the group of people who cultivated the indigenous rice had a higher price than those in modified rice varieties. They viewed it is an opportunity to create a career and income as a particular group of clients are interested in the indigenous rice. Together with outstanding packaging, the peasants will be able to generate higher income than conventional rice varieties. Moreover, with the trend of healthy food focused on non-toxic components and the food that can provide high nutritional value, indigenous rice can meet these requirements. The community leaders therefore agreed that indigenous rice varieties should be conserved in order to show the community's identity and the cultural history. Thus, they have established a group of indigenous rice cultivation in order to gather, distribute products, and create networks with people outside of the group, who share the same ideology. Thus, they have been able to exchange knowledge, techniques, methods and marketing together.

However, there was a major turning point for the situation due to the economic conditions. The members of the household stopped cultivating indigenous rice and turned to modern rice varieties. This is consistent with the concept of Santasombat (2003) who explained that the peasant in globalization era must be "the flexible peasant" for a sustainable livelihood. With the reasons as mentioned above, the number of indigenous rice varieties cultivation has decreased and the most common indigenous rice cultivation is the upland rice. There are also a few of lowland rice. For this reason, the lands are divided to cultivate other economic crops of community. This has led the remaining members and community leaders to find strategies to maintain the survival of indigenous rice and generate income for the community rather than selling as the seeds only. To begin with, the group leaders and members had launched about 10 varieties of indigenous rice at the Upland Rice Day Festival. It was a great success. The general public and government agencies were informed of the indigenous upland and lowland rice. The peasants exchanged the rice varieties, cultivation knowledge, and other strategies to promote the cultivation. Moreover, the peasants created networks to conserve indigenous rice. However, the consequence from the festival was the social network of indigenous rice cultivation, allowing the peasants to exchange, learn and expand varieties of indigenous rice. The expanding route of upland rice began from Ban Nam Yen to Nan Province located in the northern part of Thailand and lowland rice was expanded to Roi Et province located in the northeast of Thailand. Currently, there still is seed trading. In the future,

the community leaders and peasants who cultivate the indigenous rice view that the indigenous rice cultivation of Ban Nam Yen will not be lost, because they believe that there are members of the new generation who are passionate about sustaining these practices and developing their hometowns Moreover, the youth who decide to halt their studies, may learn about the lifestyle of peasants, and by doing this, they may continue to inherit and extend the community wisdom. However, the community leaders are not confident about whether the new generation will be able to sustain these traditions.

5. The Future of Peasants and Indigenous Rice in the Globalization

According to the interview and the observation of people in Ban Nam Yen and the attitude of the peasants, the researcher has analyzed the future of the indigenous rice. The research has examined two main factors. The main factors are the internal factors such as the identity of the peasants, the culture, the rituals, land ownership, or physical features of the area. This is because it can be seen from the in-depth interview and the observation the elements of the important rituals of the community. Normally, indigenous rice is used in the ritual but nowadays it was changed to modern variety rice. Nevertheless, the ritual was still carried on. Moreover, in the Ban Nam Yen Community, people paid attention in the crops that can generate more incomes to them. For this reason, the majority of people in the community turned to modern rice variety and commercial crops. Furthermore, land ownership was another factor affecting the decision on what to cultivate. For example, those with small land tended to cultivate economic crops because they were mainly concerned about their income. For those with more land, they were able to divide their land to cultivate a variety of crops. Parts of the lands were allocated to grow indigenous rice in order to conserve the rice variety and generate more income to the household. Thus, land ownership affects the existence of indigenous rice in the future. It does not mean that people in the community do not want to grow indigenous rice anymore, but that they are facing challenges when they have to allocate their limited land. Nevertheless, external factors also play a significant role that drives the community to continue cultivating the indigenous rice.

The external factors consisted of the government sector, community and government fund, financial fund from other departments, social networks, or product processing process. The researchers believed that the indigenous rice will continue to exist

due to the support from external factors. For example, the community can be supported in terms of technology and processing process. They can learn through the networks with the influences that come from outside society. This is because people in the Ban Nam Yen chose only to grow the rice variety that can attract people from other societies. They tended to leave their indigenous behind even through they have cultivated it for generations and it was a part of their ritual. However, they have not totally abandoned their indigenous rice. There are still groups of people who have conserved the indigenous rice and processed the rice product. Besides, in many families, the main income does not come from the indigenous but from the monoculture rice they chose to cultivate. Additionally, young generations who left the community to study and work elsewhere also sent some money to support the family back home. Therefore, the peasants in Ban Nam Yen can still survive. According to what has been mentioned, the external drives play a vital role to keep the indigenous rice in the era of globalization. Without the external supports, indigenous rice will gradually fade from the society. There might be only a small plot to demonstrate the indigenous rice for those who are interested and to maintain the identity of the community.

6. The Conclusion: Peasant and Indigenous Rice in Globalization

The reduction of indigenous rice reflected food security because in the past, the seed for cultivation would be in the hands of peasants. If peasants cultivated any plants, there would always be a market to support the yields. The peasants would keep certain seeds for cultivation in the next season. However, when there was the establishment of an international agricultural institution supported by the World Bank and indigenous rice declined. The modern rice variety would be the key foundation of Thai food security in which the economy would be monopolized by major companies and multinational corporations. As a result, Thai peasants did not rely on the foundation of Thai cultural identity anymore. They have instead become the ‘slaves' of commercial agricultural systems.

When the indigenous rice was considered as a pattern of lifestyle and culture, it was found that the culture was the power in the negotiation and the struggle for survival of the lower-class people. In this dimension, the lower-class people of society cannot fight or express on their resistance to the power or even political bargains openly. However, these people were not willing to compromise the power dominance but they had sought

the ways to express their power in order to show their own identity. They fought through the symbolic expressions in various forms especially the communication through culture in order to be a representative image of power struggle in local or small-scale politics. Wittayapak (2015) stated that Ban Nam Yen villagers was using the indigenous rice as a representative of traditional peasant community to fight with the modern rice variety which was a representatives of peasant society in globalization era. It was therefore a representative of the cultural politics in local politics focused on the insistence power of the Ban Nam Yen indigenous upland and lowland rice peasant group.

In addition to this, the most important issue is that the Ban Nam Yen villagers had to face in indigenous rice cultivation in globalization. The intervention of state and markets in the community caused the breakdown of the peasant community, but it also created a new relationship system known as the social network. The villagers were not forced to enter in the relationship system but they built the relationship system together in order to survive. Besides, social capital was a driven to place the foundation for the community strength and was considered as a livelihood strategy that allowed the community to survive and further develop. As it was mentioned above, the indigenous rice group in Ban Nam Yen was built by a network of peasants who were interested in indigenous rice conservation and the continuation of indigenous rice culture. They were supported by the government agencies in many sectors and became a small network for conserving indigenous rice. In terms of the livelihood strategies, occupation, and decision making in the forms of agricultural cultivation, it was a form of social network in which the villagers of Ban Nam Yen village joined together to think and decide based on the causes and outcomes of sustainable livelihood in the community level.

Another issue was the peasants' survival approaches. In globalized society, everything has cross-border links between countries in terms of transportation, market, trading, human migration and energy network. They were also linked to the new liberal market under globalization. The most important issue was how the process changed such linkage. This affected the life and relationships of various people in rural areas, states and markets. This caused the villagers in various communities to struggle and adapte their livelihoods to create a rural society in their modern world. Ganjanapan (2011) and Chiengthong (2018) said that structural adaptation was used to create a society that could survive in the changing world flows. In addition to this, they also viewed that

the changes in peasant society occurred in rural areas of Thai society. These changes gave rise to qualifications, characteristics of rural society. Sattayanurak (2017) described that the New Characteristic of Rural Society led to the traditional characteristic description framework of rural society. The structural adaptation resulted in the peasants to become the entrepreneurs with reasonable decision making. They were able to to create sustainable livelihoods.

Therefore, the peasants and indigenous rice in a globalized society must be adapted to catch up with the capitalist economy. When the indigenous rice cultivation was the root of ancestors, the contract farming and economic crops were life. The peasants should have strategies for changing the indigenous rice to be economic crops of community by creating an agricultural network to raise the quality of life of peasants. The community could design the lifestyle of community according to the needs. Thai society in rural areas must be t aware of the changing global trends. Rural society in the modern world still maintains the value of local plants as these were considered as the geographical indicator of the ecosystem abundance and diversity of biological resources, space and identity, as well as culture and lifestyle of the community.

7. Recommendations for the Peasants When Confronting with Globalization

I would like to recommend the peasants in Ban Nam Yen for their adaptation to the changing context of agricultural society, during a time of globalization. They can use the advanced technology to minimize the time and space to build networks between people. This can create the power to negotiate and help one another in academic, financial and marketing aspects. The peasants can also adapt themselves from peasants to entrepreneurs, based on traditional agriculture of the community. This can be a way of allowing them to survive in the weave of development and the beginning of green revolution. Moreover, they should gather together and build networks. This will enable them to build betters ways to negotiate, conserve, and develop the community's identity in the future.

Furthermore, the peasants should consider bringing their indigenous rice to organic agricultural process in order to increase market shares and generate a higher income to the peasants. The peasants should also be promoted and supported by

the governmental sector. The government should place an importance on every kind of rice. They should not just pay attention to the rice guaranteed by the government. This can create more opportunity for the peasants to develop themselves to be more stable. Currently, there is a department that intends to connect the organic rice market with GAP rice of the Rice Department. The Rice Department has defined the definition of organic rice but it does not include indigenous rice. However, they should support the peasants to play a role in planning and developing the rice varieties so that the peasant community will better future opportunities.

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Predictive Price Model for Buy-Sell Bitcoin

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Abstract

This study aims to find a suitable forecasting model for buying and selling bitcoin by using external factors of finance and commodities which can be divided into five major groups: foreign exchange rates, safe assets, crude oil price, the volume of buying and selling bitcoin, and stock market price index. This study used bitcoin price data collected from January 1, 2016 to March 31, 2018. However, we will consider only the latter data collected after the highest value of bitcoin, from December 27, 2017 to October 31, 2018 and we use analysis in the form of multiple linear regression, factor analysis and the Box-Cox transformation theory. When analyzing the data, it was found that $\hat{Y}^{-09} = 0.001 - 1.333\times10^{-8} F_1 - 2.360\times10^{-14} F_2 - 1.180\times10^{-8} F_3 - 1.241\times10^{-8} F_3$ is a better forecasting equation than other forecasting equations when forecasting for a short period of time only. The first factor is Chinese and South Korean stock market price index, safe assets and the foreign exchange rate. The second factor is oil prices and the volume of buying and selling of bitcoin. The third factor is Japan and Germany stock market price index and the fourth factor is the stock market price index for the U.S., Canada and Australia.

Keywords: Bitcoin, Exchange Rates, Gold Price, Stock Market, Oil Prices

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บทคัดย่อ

งานวิจัยนี้มีจุดประสงค์ของการศึกษาเพื่อหาตัวแบบพยากรณ์ราคาการซื้อ-ขายบิทคอยน์ที่เหมาะสม โดยอาศัยปัจจัยภายนอกที่อยู่ในขอบเขตของด้านการเงิน และสินค้าโภคภัณฑ์ 5 กลุ่มใหญ่ ๆ ได้แก่ อัตราแลกเปลี่ยนเงินตราต่างประเทศ สินทรัพย์ปลอดภัย ราคาน้ำมันดิบ ปริมาณการซื้อ-ขายบิทคอยน์ ดัชนีราคาตลาดหลักทรัพย์ และอื่น ๆ ซึ่งข้อมูลราคาบิทคอยน์ที่ใช้เป็นข้อมูลรายวันย้อนหลังตั้งแต่วันที่ 1 มกราคม พ.ศ. 2559 ถึงวันที่ 31 มีนาคม พ.ศ. 2561 โดยทำการวิเคราะห์ข้อมูลถัดจากช่วงที่บิทคอยน์มีราคาสูงสุด คือ ตั้งแต่วันที่ 27 ธันวาคม พ.ศ. 2560 ไปจนถึงวันที่ 31 ตุลาคม พ.ศ. 2561 และใช้การวิเคราะห์ในรูปแบบสมการถดถอยเชิงเส้นพหุ (Multiple linear regression) การวิเคราะห์ปัจจัย (Factor analysis) และทฤษฎี Box-Cox transformation ผลจากการศึกษา พบว่า $\hat{Y}^{-09} = 0.001 - 1.333\times10^{-8} F_1 - 2.360\times10^{-14} F_2 - 1.180\times10^{-8} F_3 - 1.241\times10^{-8} F_3$ เป็นสมการพยากรณ์ที่ดีกว่าสมการพยากรณ์อื่น เมื่อพยากรณ์ในช่วงระยะเวลาสั้น ๆ เท่านั้น โดยที่ F_1 คือ ดัชนีราคาตลาดหลักทรัพย์จีน และเกาหลีใต้ สินทรัพย์ปลอดภัย และอัตราแลกเปลี่ยนเงินตราต่างประเทศ F_2 คือ ราคาน้ำมันและปริมาณการซื้อ-ขายบิทคอยน์ F_3 คือ ดัชนีราคาตลาดหลักทรัพย์ญี่ปุ่นและเยอรมนี และ F_3 คือ ดัชนีราคาตลาดหลักทรัพย์อเมริกา แคนาดา และออสเตรเลีย

คำสำคัญ: บิทคอยน์ อัตราแลกเปลี่ยนเงินตราต่างประเทศ ราคาทองคำ ดัชนีราคาตลาดหลักทรัพย์ ราคาน้ำมัน

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1. Introduction

Bitcoin was the first created cryptocurrency and is the most well-known. Bitcoin was created with a computer language and thus it has no owners, no shape and it is immaterial which is different from banknotes or coins (Siamblockchain, 2014) In bitcoin systems, the number of coins has a maximum limit of 21 million bitcoins (Goalbitcoin, 2017b) and it is also the most popular digital currency that the market has almost completely accepted for most buy-sell exchanges compared to other digital currencies. The advantages of bitcoin is that it has a low cost of transaction, and those who confirm a transaction will be rewarded with a bitcoin that has already been created. In addition, bitcoin is difficult to detect so it is popular in many countries that have restrictions on money transfers and political problems (Lueangnarumitchai, 2015).

Nowadays, many countries have begun to accept bitcoin such as the U.S., Canada and Japan. Bitcoin can be used instead of cash and these countries also passed legislation to control the use of Bitcoin in 2015 (Kapook, 2014). Japan and South Korea passed legislation to control digital money to be used correctly and control tax status and safety of use, and also prevent money laundering and illegal use (Mgronline, 2017; Todaylineme, 2017). In Japan, the government introduced bitcoin as a way to stimulate the economy and counter deflation that has persisted for more than 30 years. Moreover, 10 major companies in the U.S. accept payments with bitcoin: PayPal, Dell, WordPress, Dish, Wikipedia, Subway, EBay, Microsoft, Apple Store and Amazon (Goalbitcoin, 2017a). Bitcoin can be used to buy and sell products instead of cash whether making purchases of products on Amazon, booking hotels, booking air tickets, making payment of tuition fees, ordering a pizza, using a VPN service, buying a diamond, buying and selling Dell computers, buying Windows operating systems and purchasing via gift card. There are currently more than 100,000 shops and services that accept bitcoins around the world (Jiraboon, 2017a).

Many countries have begun to accept bitcoin and people are using it to buy and sell more. Therefore, Bitcoin has become an increasingly attractive investment alternative. Also, as bitcoin can be used legally in many countries, it may affect many organizations or businesses in terms of finance and other aspects. In addition, the creator of Bitcoin Satoshi Nakamoto said, “We have proposed a system for electronic transactions without relying on trust” (Nakamoto, 2008). The excerpt implies that bitcoin is a social economic product

as trust was explicitly mentioned. Therefore, bitcoin might be a significant economic indicator in the future (Kapook, 2014; Secretariat of the House of Representatives Academic group, 2017). However, bitcoin currency is still considered a new currency to the society. Although it was created nearly 10 years ago, people have become seriously interested in bitcoin in only the last 2-3 years in Thailand. Furthermore, few researchers have studied bitcoin. However, Greaves and Au (2015) used a Regression Model consisting of Linear Regression and SVM Regression, and classification model that consisted of Logistic Regression SVM and Neural Network in an analysis of bitcoin price. It was found that the price forecast of bitcoin in dollars 1 hour in advance was accurate. The movement of bitcoin price was approximately 55%. McNally (2016) used Machine Learning in their analysis and found that the operations of Bayesian optimized recurrent neural network (RNN) and Long Short Term Memory (LSTM) networks are the most accurate. Moreover, Jang and Lee (2017) used Bayesian Neural Networks to analyze bitcoin and found Bayesian neural networks (BNNs) predict the price of bitcoins and explains the high volatility of the latest bitcoin prices best. All these studies discussed above used external factors in their analyses.

Figure 1 shows the fluctuation in the bitcoin price which was significantly higher by the end of 2017 due to the separation Bitcoin to Cash (BCH) on July 1, 2017, and the update of bitcoin to Segwit2X (B2X) on August 1, 2017. Later, there is a new version of the protocol that separates the back line bitcoin from the block number 491,407 on the blockchain of Bitcoin to Bitcoin Gold (BTG) on November 1, 2017 and it is allowed to download on November 12, 2017 (Jiraboon, 2017b). In addition, the largest financial institution which provides buy-sell option market in the U.S., the Chicago Board Options Exchange (CBOE), launched Bitcoin Futures on December 10, 2017 (DAVITT, 2017). After that, Chicago Mercantile Exchange & Chicago Board of Trade, also known as CME Group Inc. (CME), launched the same product on December 18, 2017 (Jiraboon, 2017d, 2017e) Then, on 28 December 2017, it has returned to use B2X again after announcing the cancellation of the hard fork on November, 2017. After that, began the buying and selling of Bitcoin Diamond (BCD) which resulted from the separation from bitcoin on January 16, 2018. The amount of bitcoin, which is limited to 21 million BTC, was increased to 210 million BCD (Blognone, 2017b) and there was another digital currency which separated from Bitcoin to BitcoinZ (BTCZ) on February 22, 2018 (Blognone, 2017a).

However, there are still a large number of groups that want to separate from bitcoin lines, including Bitcoin Silver, Bitcion Platinum, Bitcoin Uranium, Bitcoin Cash Plus, Super Bitcoin and Lightning Bitcoin (Arstechnica, 2017). This may affect the bitcoin price in the short term.

Since the researcher who had studied forecasting the bitcoin price as mentioned above used internal factors to analyze in a very short period of time, the differences on the overall bitcoin price may not be seen. Therefore, the researcher is interested in applying external factors in forecasting in order to develop a suitable model for forecasting bitcoin prices.

Figure 1: Bitcoin Amount by Currency

2. Related Documents and Research

Based on documents and research related to bitcoin, the researcher found that the same independent variables that are external factors other researchers have used in their studies are the gold price, foreign exchange rate, bitcoin exchange rates for foreign currencies and the S&P 500 index.

However, Bitcoin is similar to shares (Prachachat Business, 2017). The researcher studied the independent variables obtained from documents and research related to stock prices. It was found that independent variables that are external factors other researchers have used in their studies are the Dow Jones Industrial Index, foreign exchange rates, gold prices and crude oil price index. Therefore, the variables that the researcher is interested in studying are the Dow Jones Industrial Index and crude oil price index.

According to documents and research related to bitcoin price and stock price, and also the study of variables related to the stock market index, and the information on Siam blockchain, which is a collection of news and information about the major digital currency of Thailand, here is a summary of the information pertaining to bitcoin.

1. Japan was the first country that accepted bitcoin as a currency.
2. The U.S. collects bitcoin tax.
3. China accepts bitcoin and has been considered to have the highest level of bitcoin mining.
4. Finanzen.net, the largest financial website in Germany, has listed bitcoin as the main currency.

Moreover, Marketingoops reveals that Canada had the world's first bitcoin ATM, and the latest data of CoinATMradar suggests that the country with the largest number of bitcoin ATMs installed is the U.S., Canada and Austria respectively. In addition, the UPbit.com, one of the top five bitcoin trading international websites, had the highest level of the buying and selling of bitcoin in 2018, and it is supported only for Korean traders.

All the above-mentioned information shows that bitcoin is accepted and there are a large number of investors who are interested in investing in bitcoin in these countries. Therefore, the researcher is interested in studying the stock market index variables in the stock exchange of Japan, the U.S., China, Germany, Canada, Australia and South Korea.

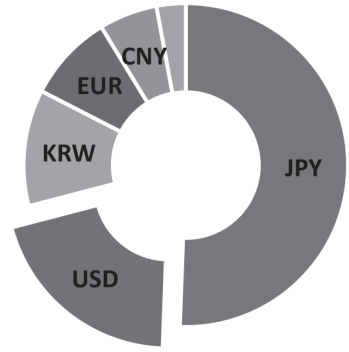


Figure 2: Bitcoin Amount by Currency
Source: https://bitcoin-addict.com/2017/10/05/why-bitcoin-depend-on-japan-and-south-korea

Figure 2 shows the amount of buying and selling of bitcoin. It has been bought and sold most in Japanese yen (JPY), U.S. dollar (USD), South Korean won (KRW), euro (EUR) and Chinese yuan (CNY), respectively. Therefore, the variable of the foreign exchange rate that the researcher is interested in studying is the currency exchange rate of the Japanese Yen, U.S. Dollar, South Korean Won, the Euro and Chinese Yuan.

According to the demand and supply principles, the buy-sell price is related to the volume of buying and selling. Therefore, the amount of buying and selling bitcoin is another study variable. The independent variables used in this study can be summarized as follows: the foreign exchange rate of the Japanese yen, U.S. dollar, South Korean won, Euro and Chinese yuan; gold prices including gold spot price (USD), platinum spot price (USD), gold futures contract (USD) and platinum futures contract (USD); crude oil price, which is the oil price from major markets in the world including WTI crude oil spot prices (USD), WTI crude oil futures contracts (USD), Brent oil futures contracts (USD) and US gasoline futures contracts (USD) as the U.S. is the country that imports most oil in the world; the volume of bitcoin buying and selling (USD) and the Japanese stock market price index (the major indexes are Nikkei 225 (N225) and TOPIX (TOPX)), U.S. stock exchange price index (the major indexes are Dow Jones Industrial Average (DJI), Nasdaq 100 (NDX) and NASDAQ Composite (IXIC)), Chinese stock market price index (the major indexes are Shanghai Composite (SSEC) and SZSE Component (SZSC1)), Germany stock market price index (the major indexes are DAX (GDAXI) and Euro Stoxx 50 (STOXX50E)), the Canadian stock market price index (the major index is S&P / TSX Composite (GSPTSE)),

Australian stock market price index (the major index is S&P / ASX 200 (AXJO)) and South Korean stock market price index (the major indexes are KOSPI (KS11) and KRX 100 (KRX100)).

3. Methodology

3.1 Data Collection

The data used in this study is secondary data that can be found from various sources such as bitcoin price data, retrieved from https://finance.yahoo.com, and other relevant variable information retrieved from https://th.invest-ing.com etc.

This study used bitcoin price data searched for on June 17, 2018, which consists of daily data of 402 days (excluding weekend and public holidays) collected from January 1, 2016 to March 31, 2018. Therefore, the information of other related variables have to be managed in accordance with both the date of the data collection and the total number of days.

External factors that will be analyzed are the term of finance and commodities, which can be divided into five major groups: foreign exchange rates, safe assets, crude oil price, the volume of buying and selling bitcoin, and stock market price index.

3.2 Variables and Tools

This study uses analysis in the form of multiple linear regression and factor analysis, which are analyzed using program SPSS 24 and Minitab 16 as an analytical supporter. The variables are shown in Table 1.

Table 1: Dependent and Independent Variables Used in Multiple Linear Regression Analysis

Symbol	Definition	Unit
Y	Daily close price of Bitcoin	USD
X_1	US dollar exchange rate to Japanese yen	USD/JPY
X_2	US dollar exchange rate to South Korean won	USD/KRW
X_3	US dollar exchange rate to euro	USD/EUR
X_4	US dollar exchange rate to Chinese yuan	USD/CNY
X_5	Gold spot price	USD
X_6	Platinum spot price	USD
X_7	Gold futures contract	USD
X_8	Platinum futures contract	USD
X_9	WTI crude oil spot prices	USD
X_{10}	WTI crude oil futures contracts	USD
X_{11}	Brent oil futures contract	USD
X_{12}	US gasoline futures contracts	USD
X_{13}	The amount of buying and selling bitcoin	USD
X_{14}	Dow Jones Industrial Average Stock Index (DJI)	None
X_{15}	Nasdaq 100 Stock Index (NDX)	None
X_{16}	NASDAQ Composite Stock Index (IXIC)	None
X_{17}	Nikkei 225 Stock Index (N225)	None
X_{18}	Topix stock index (TOPX)	None
X_{19}	DAX Stock Index (GDAXI)	None
X_{20}	Euro Stoxx 50 Stock Index (STOXX50E)	None
X_{21}	Shanghai Composite Stock Index (SSEC)	None
X_{22}	SZSE Component Stock Index (SZSC1)	None
X_{23}	S & P / TSX Composite Stock Index (GSPTSE)	None
X_{24}	S & P / ASX 200 Stock Index (AXJO)	None
X_{25}	KOSPI Stock Index (KS11)	None
X_{26}	KRX 100 Stock Index (KRX100)	None

3.3 Research Methods

Daily bitcoin price is depend on various factors, and such factors may or may not have a direct effect on the price of bitcoin on the specific day or it may directly affect the bitcoin price tomorrow or the day after tomorrow. This represents that the price of bitcoin in the specific day may be affected from the result of the bitcoin price of the previous days. Thus, the historical price may affect the current price of bitcoin. The researcher therefore chose to use the multiple linear regression analysis method in this study by performing linear regression of external factors as appropriate.

In this study, the multiple linear regression analysis model will be calculated as follows:

$$Y_1 = \beta_0 + \beta_1 X_{1,t-1} + \beta_2 X_{2,t-1} + \ldots + \beta_{26} X_{26,t-1} + \varepsilon_t \quad (1)$$

t is the duration, ε_t is a random error, and the dependent variables (Y) and the predictive variable $X_1, X_2, \ldots, X_{26}$ are shown in Table 1.

Bitcoin price forecasting in this study uses linear regression analysis based on the model (1) above, regression modeling for bitcoin price forecasting will begin by examining various assumptions and correcting the hypothesis which is not true. Checking examination and implementation will be stated in the following steps.

The first step, we are going to use the data from January 1, 2016 until March 31, 2018, as the first data which fluctuates because it is during the launch of bitcoin. The prediction uses past events to predict the future as the future may be similar to the past. Since the first data is likely to be different from the future, so we will consider only the latter data which is the data collected after the highest value of bitcoin, and it is the price of bitcoin from December 27, 2017 to October 31, 2018. The analysis is divided into two cases: first, raw data will be analyzed; second, data converted into default value will be analyzed.

In the second step, since the data were collected from variables with very different units, the data will be converted to the default value and analyzed as follows.

1. To examine the hypothesis and resolve the lack of important features.

1.1 Hypothesis examination for regression analysis, examination methods and criteria as follows.

1) Examination of Multicollinearity will consider VIF, if VIF > 10, means the variable has Multicollinearity. If Multicollinearity is found in the variable, problems have to be fixed until the Multicollinearity has no longer exist in the variable.

2) To examine the hypothesis of random errors (ε).

2.1) To fit the linear model by using Ordinary least squares (OLS).

2.2) To enumerate check by considering the Significant values of Kolmogorov-Smirnov statistics and Normal Probability Plot.

2.3) To examine the Homogeneity of variance of random errors by using the Residual plot.

2.4) To examine the Autocorrelation of random errors by using the test of Durbin- Watson.

The third step, To correct the hypothesis which is not true, refer to the following steps.

1) To solve multicollinearity problems by using Factor analysis as detailed below.

1.1) To Measure the appropriateness of the data by using statistics of Kaiser-Meyer-Olkin (KMO).

1.2) To do preliminary test by using Measure of Sampling Adequacy (MSA), MSA values of variables can be seen from the Anti-image correlation matrix by reading the diagonal values of the matrix, which is the Communality: h^2.

1.3) To do factor extraction (Component factor analysis) by using Principal component Method (PC).

1.4) To do rotation by using orthogonal rotation with the Varimax method, and to specify the number of factors by using the Latent root criterion method, that will be considered from Eigenvalue (Eigenvalue should be greater than or equal to 1.) If the maximum weight factor is found in any factor, such variable will be set in that factor.

2) To solve the problem of the hypothesis of random error which is not true by using the Box-Cox transformation theory that the data conversion format,

is $Y' = Y^{\lambda}$ when λ is the parameter value obtained from the data, where $1 \leq \lambda \leq -1$.

2. To develop models from the result of problem solution and bring the information into the developed model.

3. To calculate significant indicators for every forecasting evaluation in order to see the error of the model in forecast.

4. To compare forecasting equations.

4. Results

Bitcoin price data from December 27, 2017 to October 31, 2018 will be analyzed, which can be divided into two cases as follows.

Case 1: Use the bitcoin price data as raw data in the analysis

When analyzing, we can divide the data into four factors as follows: Factor 1 is "Chinese and South Korean stock market price index, safe assets and the foreign exchange rate." The second factor is "oil prices and the volume of buying and selling bitcoin." The third factor is "Japan and Germany stock market price index" and the fourth factor is "The stock market price index for the U.S., Canada and Australia." There are two types of models as follows.

Model 1: $$Y_t = \beta_0 + \beta_1 F_{1,t-1} + \beta_2 F_{2,t-1} + \beta_3 F_{3,t-1} + + \beta_4 F_{4,t-1} + \varepsilon_t$$

Model 2: $$Y_t^{0,9} = \beta_0 + \beta_1 F_{1,t-1} + \beta_2 F_{2,t-1} + \beta_3 F_{3,t-1} + + \beta_4 F_{4,t-1} + \varepsilon_t$$

While β_0, β_1, β_2, β_3 and β_4 of each model with the values as Table 2 and $F_1 = \sum_{i=1}^{n} X_i$ when $i = 1,2,...,n$ and X_i is a variable that is a member of factor t.

Case 2: Use the bitcoin price data that has been converted to default values in the analysis

In this analysis, we will analyze in the same way as in Case 1, which has similar results. We will obtain the model 3 and 4 as follows.

Model 3: $$Y_t' = \beta_0 + \beta_1 F_{1,t-1} + \beta_2 F_{2,t-1} + \beta_3 F_{3,t-1} + + \beta_4 F_{4,t-1} + \varepsilon_t$$

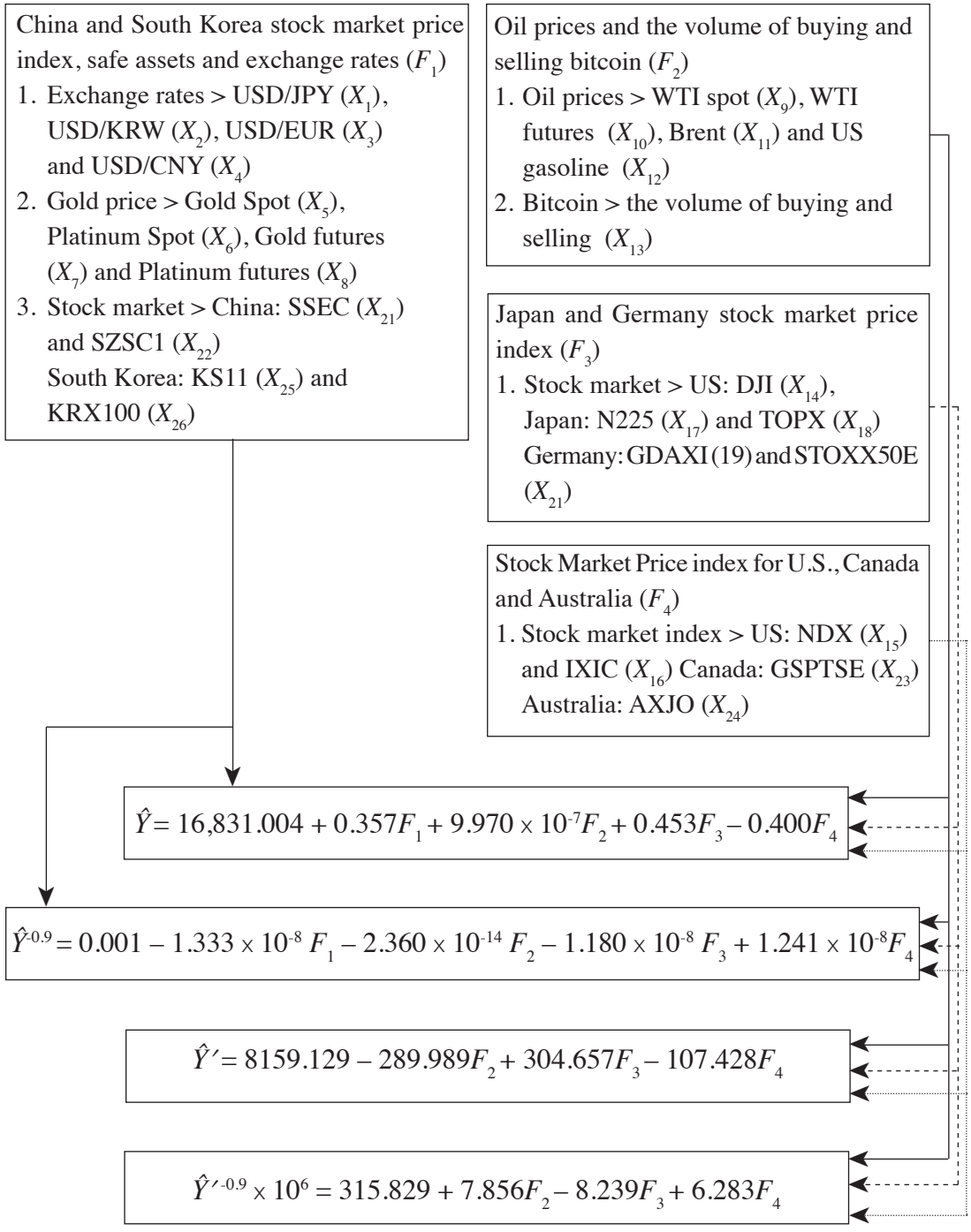
Model 4: $$Y_t'^{0-,9} = \beta_0 + \beta_1 F_{1,t-1} + \beta_2 F_{2,t-1} + \beta_3 F_{3,t-1} + + \beta_4 F_{4,t-1} + \varepsilon_t$$

While $\beta_0, \beta_1, \beta_2, \beta_3$ and β_4 of each model with the values as Table 2 and $F_1 = l_{t,i} Z_{t,i} + l_{t,i+1} Z_{t,i+1} \ldots + l_{t,i+n} Z_{t,i+n}$ when $i = 1,2,...,n$ and l_t is the weight of factors derived from factor analysis.

Table 2: Various Models from the Analysis

Regression Coefficients of the Variables					
Model	β_0	β_1	β_2	β_3	β_4
1	–16,831.004	0.357	9.970×10^{-7}	0.453	–0.400
2	0.001	-1.333×10^{-8}	-1.333×10^{-8}	-1.180×10^{-8}	1.24110-6
3	8159.129	-	–289.989	304.657	-170.428
4	315.829×10^{-6}	-	7.856×10^{-6}	-8.239×10^{-6}	6.283×10^{-6}

4.1 Variables in Each Factor of Case 1 and Case 2



4.2 Forecast from the Model that can be Obtained

From all the above analysis, will obtain the forecast equation as follows:

$$\hat{Y} = 16{,}831.004 + 0.357F_1 + 9.970 \times 10^{-7}F_2 + 0.453F_3 - 0.400F_4 \quad (2)$$

$$\hat{Y}^{-0.9} = 0.001 - 1.333 \times 10^{-8}\,F_1 - 2.360 \times 10^{-14}\,F_2 - 1.180 \times 10^{-8}\,F_3 + 1.241 \times 10^{-8}F_4 \quad (3)$$

$$\hat{Y}' = 8159.129 - 289.989F_2 + 304.657F_3 - 107.428F_4 \quad (4)$$

$$\hat{Y}'^{-0.9} \times 10^6 = 315.829 + 7.856F_2 - 8.239F_3 + 6.283F_4 \quad (5)$$

When applying the four predictive equations, the short-term forecasting model is a period of one week from 1 November 2018 until 9 November 2018 (not counting weekends or holidays) and long-term forecast is one month from 1 November 2018 until 30 November 2018 (not counting weekend or holidays). Results as shown in Table 3, Figure 3 and Figure 4.

Table 3: Statistics of Various Models

Model	Statistics			
	R Square	Adjusted R Square	RMSE (1-week)	RMSE (1-month)
Model 1	0.613	0.599	362.12	1,679.60
Model 2	0.657	0.645	134.40	1,680.63
Model 3	0.670	0.661	1,674.10	4,574.12
Model 4	0.697	0.688	1,385.10	4,367.60

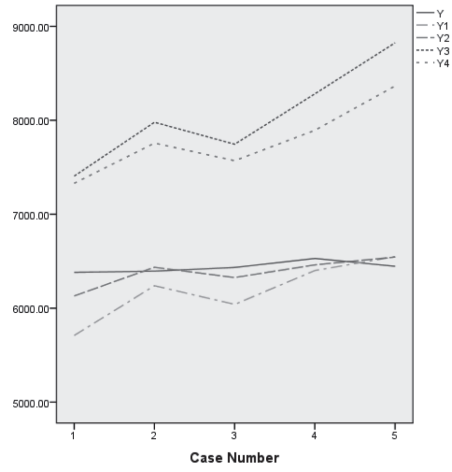


Figure 3: Forecast in 1-week Period

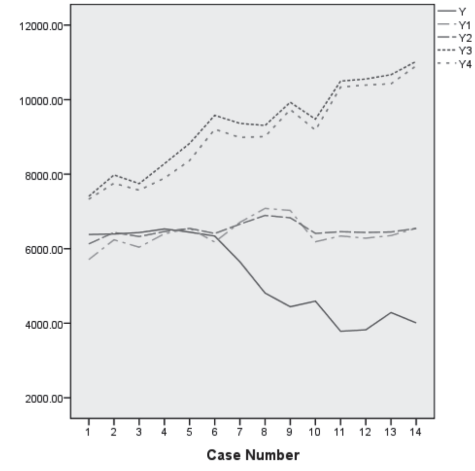


Figure 4: Forecast in 1-month Period

The forecast for a period of one week it can be seen that the prediction using the model in Case 1 will be able to predict better than the model in Case 2, and the second model forecasts better than the Model 1. Regarding the prediction within the duration of one month it can be seen that Model 1 and Model 2 can predict well in the first period only. Later, both models perform poor predictions. In Model 3 and Model 4, a false forecast can be seen since the beginning, with the bitcoin price likely to change differently from the actual value. From this, it can be seen that, the longer the period of forecasting, the less predictability of every model. Thus, long-term forecasting may not be appropriate as we can see that the forecasting in the two different periods of time, and the models used in the analyses fit in different ways. In the case of long-term forecasting, other variables may also be required to be considered because bitcoin prices are still fluctuating, therefore choosing the right model for the nature of the data should be more useful than choosing one specific model.

5. Summary

Based on the study of factors affecting the price of bitcoin by converting raw data into default values and using factor analysis to solve the problem of multicollinearity, cases 1 and 2, when analyzing later graph data by analyzing data from December 27, 2017 to October 31, 2018, the result is the Chinese and South Korean stock market price index, safe assets and foreign exchange rates, oil prices and the amount of buying and selling bitcoin, Japan and Germany stock market price index and the stock market price index for USA, Canada and Australia have affecting the price of bitcoin. And from the study to find a suitable forecasting model for buying and selling bitcoin by using external factors, it was found that, case 1, when analyzing the factors consisting of China and South Korea stock market price index, safe assets and foreign exchange rates, oil prices and the amount of buying and selling bitcoin, Japan and Germany stock market price index and the stock market price index for USA, Canada and Australia to solve the problem of multicollinearity and variable conversion, and to do Box-Cox transformation to solve the problem of the hypothesis of random error which is not true. 2 forecasting equations were obtained as shown in the equation (2) and (3). In case 2, raw data is converted to default values and then analyzed in the same way as in case 1, 2 forecasting equations were obtained as shown in the equation (4) and (5).

6. Discussion

6.1 Technical Discussion

When analyzing the data, it was found that the data had multicollinearity problems. We therefore use factor analysis to solve the problem. The result is the data has no multicollinearity problems. In addition, the dependent variable has an abnormal distribution of random errors. We therefore solved the problem by using the Box-Cox transformation theory, and the result is a distribution of random errors that is normal. When converting raw data to default values, it was found that the forecasting equations were in a more compact form and can easily change the result. For the analysis results of the factor analysis, the results are the same as the previous analysis.

To convert raw data to the default values helps each factor to have equal units, and in each forecasting equation, the coefficient of any factor is very important, which means it has a large influence on the price of bitcoin.

6.2 Informational Discussion

When applying the analytical factors to the multiple linear regression analysis, it was found that the factors that came into the forecasting equations of all four models were Factors 2, Factor 3 and Factor 4 of both cases. The second factor was oil price and the amount of buying and selling bitcoin; the third factor is the Japanese and German stock market price index; and the fourth factor is the stock market price index of the U.S., Canada and Australia. Each factor obtained from the analysis will be changed constantly because the price of bitcoin is still unstable. However, if there is a large amount of data to be analyzed, results should improve.

The objective of studying the factors that affect the bitcoin price and studying the suitable model for the price forecast of bitcoin is based on external factors. The result of the study shows that when categorizing all external factors, it was found that in Case 1, all external factors affected the price of bitcoin which is in line with Georgoula et al. (2015) who stated the exchange rate between U.S. dollars and euro affects the bitcoin price. Moreover, Poyser (2017) stated that foreign exchange rate affects the market price of bitcoin. In fact, in each of these factors, there may be some factors that do not in fact affect the bitcoin price but the combination of factors that are related to

each other is the avoidance of multicollinearity problems. It can be seen that the prediction from the model is close to the actual price of bitcoin during the first period. Also, there will be discrepancies during the period in which the bitcoin price is very volatile, and this may be affected by events that occurred during the specific period, whether it is the separation of the new currency from bitcoin or other situations that occurred during that period. According to the model adopted to predict the data derived from the data used in this study, it was found that the result is not very close to the actual price of bitcoin, which means that long-period forecast may not be appropriate. In addition, in Case 1, the analysis result obtained from raw data is closer to the actual data than the analysis result obtained from data that has already been converted to default values.

6.3 Forecasting Discussion

When comparing all the forecasting equations from the analysis to see the direction of changes that will affect the price of bitcoin, the result is that the prices of foreign exchange rates and the safe assets had changed in the same direction as the bitcoin price. Most stock market price indexes will change in the same direction as the bitcoin price, especially the Dow Jones Industrial Average (DJI), stock market index of Japan and stock market index of Germany. In terms of the buying and selling bitcoin, it has multicollinearity with variables within other factors which cannot determine the exact direction. Therefore, it should be considered together with other variables. Moreover, the crude oil price also cannot determine the exact direction.

However, there are still researchers who predict bitcoin prices in various ways such as Ji, Kim, and Im (2019) who used daily data from November 29, 2011 to December 31, 2018 and internal factors analyzed with Deep Learning. It was found that their performance was not particularly accurate for Bitcoin price prediction. Overall, there was no clear best model and the performance of all deep learning models were comparable to each other. They also determined the effect of the sequence size on regression and effect of the sequence size on classification. Moreover, Mangla, Bhat, Avabratha, and Bhat (2019) studied approximately one-hour intervals between October 10, 2015 and March 01, 2019 using internal factors ad analyzed with Machine Learning. They found that ARIMA performs well for next day's predictions but performs poor for longer terms such as given

last few days' price to predict the next five to seven days' prices. RNN performs consistently up to six days. From both of these studies, it can be seen that long-term bitcoin price forecasting is not appropriate and it is still premature to solely use such models for algorithmic bitcoin trading, which is consistent with the results of this researcher. Both of these studies used internal factors to analyze which is different from this research which used external factors. In addition, this research and the other two studies are different in the extent of the data used and the range of data used. Therefore they cannot be compared.

7. Recommendations

7.1 Recommendations for Models and Analytical Techniques

1. This study uses the factor analysis techniques to solve multicollinearity problems. The value that is calculated is the sum of each variable in that factor which may result in forecast as the value obtained may not be as close to the actual value as it should be.

2. To use the Box-Cox transformation theory to resolve the problem that the rest of the variable has an unusual distribution. If the data are abnormal in the same way as the data that is analyzed, we may consider from the normal probability plot graph that is obtained.

3. To convert raw data to default values, we may convert the value in order to make each factor have equal units and change the result easier.

4. The model obtained from the analysis may be insufficient for the possibility that may affect a bitcoin price.

7.2 Recommendations for Applying the Result

1. Since bitcoin has the highest market value and buying and selling volume among digital currencies we can apply the results to other digital currencies to consider the price trend and reduce the risk of investment.

2. Those interested in studying or investing in bitcoin can apply the research result to study and make a decision to invest in bitcoin in the future in order to reduce investment risks. Moreover, external factors that affect the price of bitcoin in this study

can be used to make a decision, which may emphasize variables related to oil prices, stocks and foreign exchange rates primarily as well as being able to apply the model from the study to analyze the trend of the bitcoin price during a short period of time in order to support the investment, so one can see if the investment in the specific period is very risky or suitable to invest in or not. However, the model obtained from the study could be used to predict the bitcoin price over a short period of time. It is not suitable for forecasting over a long period of time because the price of bitcoin is still highly volatile.

3. Regarding organizations, the result of this study may not be very beneficial. However, the organizations that are interested in investing in bitcoin can use the result from this study to obtain better results in future studies.

7.3 Recommendations for Further Studies

1. Forecasting

In this study, the data were analyzed from December 27, 2017 to October 31, 2018, which is a period of significant fluctuation. If a researcher wishes to predict further, they may cut some historical data and analyze only the data at the point that is considered appropriate by selecting the forecast data in the period with the least change.

2. The duration and data used in forecasting

This study analyzes daily data to forecast for a period of one week and one month, which may be regarded as too long, making the forecast not appropriate because bitcoin prices are still fluctuating significantly. In future studies, researchers may determine a shorter forecast time. If the data used is still daily data, they may determine the short-term forecasting period of three days, medium period of one week and long period of 10 days.

In this study, the events that occurred and affected bitcoin were not taken in account in the analysis. In future studies, such events may be analyzed as well. In addition, researchers may take into account recruit a spectrum of trust dimensions as input variables to advance the research.

3. Investment

In this study, the predictive model may not be very suitable. If researchers apply the result as an investment guide, they may have to take into account other aspects to make decisions as well to reduce the risk.

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Bitcoin Investment Behavior in Thailand

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Abstract

This study investigates Thai investors who invest in Bitcoin via questionnaires responded to by 389 Bitcoin investors as well as quota sampling. The research found that more than 70% of male and female investors have speculation and revenue as their investment objective. Investors with the main purpose of investing in Bitcoin for fun and entertainment were mostly found to be aged less than 23 years old. When considering occupation, it was found that these were students. On the other hand, investors over 40 years old most likely invested in Bitcoin to diversify their investments. Interestingly, no more than 10% of investors invest using only mining, while more than half invest for speculation only. Regarding those who influence the decisions of investors, most male and female investors invested by themselves followed by considering advice from analysts, reviews, and various media. Moreover, we found that the investors with different occupations have different investment behavior in terms of investment experience in Bitcoin, the amount of Bitcoin that has the most possession, and the current amount of Bitcoin remaining.

Keywords: Thai Investor, Investment Behavior, Bitcoin

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พฤติกรรมการลงทุนใน Bitcoin ของนักลงทุนชาวไทย

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บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาผู้ลงทุนไทยตามพฤติกรรมการลงทุนใน Bitcoin โดยอาศัยข้อมูลจากการเก็บรวบรวมแบบสอบถามจากผู้ที่ลงทุนใน Bitcoin จำนวน 389 ราย และใช้วิธีการสุ่มตัวอย่างแบบโควต้า (Quota Sampling) ผลการศึกษา พบว่า ผู้ลงทุนไทยที่ลงทุนใน Bitcoin ทั้งชายและหญิง มากกว่าร้อยละ 70 มีวัตถุประสงค์หลักของการลงทุนเพื่อเก็งกำไรและเป็นโอกาสเพิ่มรายได้ นักลงทุนที่มีวัตถุประสงค์ในการลงทุนเพื่อความสนุก บันเทิง ส่วนใหญ่จะพบในนักลงทุนที่มีอายุน้อยกว่า 23 ปี เมื่อพิจารณาตามอาชีพ พบว่า เป็นผู้ลงทุนที่มีอาชีพนิสิต/นักศึกษา ในขณะที่ผู้ลงทุนที่มีอายุ 40 ปีขึ้นไปมีสัดส่วนของวัตถุประสงค์เพื่อกระจายการลงทุนมากกว่ากลุ่มอายุอื่น มีนักลงทุนไม่ถึงร้อยละ 10 ที่ลงทุนโดยใช้วิธีการขุดอย่างเดียว และมากกว่าครึ่งลงทุนโดยการซื้อขายเพื่อเก็งกำไรอย่างเดียว สำหรับผู้ที่มีอิทธิพลต่อการตัดสินใจของผู้ลงทุน พบว่า ในภาพรวมทั้งผู้ลงทุนชายและหญิงส่วนใหญ่ลงทุนโดยเชื่อตนเอง รองลงมา คือ พิจารณาจากนักวิเคราะห์/บทวิเคราะห์/สื่อต่าง ๆ อีกทั้ง ยังพบว่า ผู้ลงทุนที่มีอาชีพต่างกันจะมีพฤติกรรมการลงทุนต่างกันในด้านของประสบการณ์การลงทุนใน Bitcoin จำนวน Bitcoin ที่เคยครอบครองสูงสุด และจำนวน Bitcoin คงเหลือในปัจจุบัน

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1. Introduction

Investing in financial assets in the form currency exchange or speculation in currency trading is very popular because they are alternative financial tools for those who have savings to invest in order to receive returns or benefits higher than savings with commercial banks or financial institutions. The exchange of other currencies and baht is in accordance with the exchange control laws and measures to prevent the speculation of the Thai baht in order to reduce volatility and firmly maintain the exchange rate of baht (Bank of Thailand, 2015). Due to rapid financial technological development new currencies have appeared known as digital currencies or cryptocurrencies such as Bitcoin, Ethereum, and Ripple which are currencies designed to be delivered all over the world (Nakamoto, 2008) and which do not depend on any fiat currency. Also, there is no central control as with local fiat currencies that are controlled by banks and international financial institutions (Barber et al., 2012) which is responsible for checking actions and tracking users. As a result, digital currencies have gained attention quickly. Interestingly, the most popular digital currency is Bitcoin and it considered the world's first digital currency used for trading, exchanging products and services widely in many countries (Gangwal, 2016). For example, in U.S., Amagi Metals is a large gold trader who pays salaries to employees using Bitcoin instead of money. It is also testing a gold trading system where gold trading services can be paid for with a digital currency. Currently, customers have paid for approximately 40-60% of the company's products and services in digital currency (Wass, 2015). In October 2013, Canada launched the world's first Bitcoin ATM in Vancouver which can exchange Bitcoin for cash or exchange cash for Bitcoin (Bangkokbiznews, 2013). In Asia, many governments have announced that Bitcoin can be used to pay according to the law, especially Japan (Pollock, 2018).

However, although the use of Bitcoin in Thailand does not have any prohibition or exclusion, it is not yet recognized as a legitimate asset. There are only laws regarding taxation and the framework for operating digital assets (Startupthailand, 2018). Moreover, the BoT cannot control the amount of money in the system for stability. Therefore, the risk of digital currency is high because the currency fluctuates highly depending on demand (Bank of Thailand, 2014). In practice, Bitcoin is traded for different purposes by individuals through various websites such as BX.in.th. Bitcoin is seen as a financial asset rather than a currency and it can be used to manage risk (Klabbers, 2018). Additionally, it looks like

a stock in terms of profits that depend on the value of the asset (Security Bank Finance, 2017). Therefore, Bitcoin has become more popular and continues to attract investors both locally and internationally, resulting the price of Bitcoin rising over past seven years. Even though the price of Bitcoin price had a precipitous fall (buybitcoinworldwide, n.d.), it has continued to receive interest from society and investors (Urquhart, 2017).

Based on the literature review, there are a large number of studies of Bitcoin. Most research focused has on technology related to Bitcoin rather than Bitcoin investment behavior. However, Glaser et al., (2014) found that the behavior of the investors in Bitcoin is more for speculation rather than to buy products and services. There are also a large number of studies of investment behavior in Thailand, however there has been no investigation of investment behavior in Bitcoin. For this reason, we are interested in studying the investment behavior of Thai investors in Bitcoin. The research results will be useful to those who are interested in investing in Bitcoin as well as providing information that may be of use to related agencies.

2. Concepts, Theories and Literature Review

2.1 Information Concerning Bitcoin

Bitcoin was created by a person named Satoshi Nakamoto using a decentralized system (Longtunman, 2018: 20). It is a financial system that is not controlled by a bank or international financial institutions and it can be sent freely around the world and has a transfer fee lower than banks. Bitcoin is not dependent on any fiat currency but is a form of money designed to work on a technology called Blockchain which is a distributed system technology that records transactions from the first transaction to the present. When a transaction is completed and amount is verified, group of transactions will be placed in a box to be placed together. The information contained in each box is always referenced and cannot be edited. Editing data in one box will cause the data to conflict with the data in another box. Verification of transactions in Bitcoin uses Public Key Cryptography, consisting of private keys that the owner must keep secret and public keys that others can know. Regarding Bitcoin storage, it will be stored in a Bitcoin wallet that contains the remaining balance, transaction history, and the address of the transaction. However, will not reveal user information and users do not have to identify themselves when using the service. Moreover, it can be installed on a computer and various portable

devices or deposited with an Internet service provider before use to exchange for products and services. In general, Bitcoin can be owned via two main channels as follows:

1. Bitcoin Mining is confirming the transaction or transferring Bitcoin because there is no central or systems for Bitcoin which can confirm transactions such as banking systems. Therefore, it requires a group of users called Miner who have the ability to confirm the trans action instead. The first person who confirms a transaction will receive Bitcoin as a return.

2. Buying Bitcoin from trading boards on both Thai and foreign websites that provide Bitcoin and other digital currency trading services. The buyer is able to exchange local currency and almost all currencies are accepted. For the average person, buying and selling Bitcoin in such a way is the easiest means for exchanging bitcoin for investment.

2.2 Factors influencing investment behavior

Experts define the meaning of consumer behavior variously, but most define it in the same way. For example, Moven and Minor (1998: 5) define consumer behavior as the unit of purchase and exchange process related to acquisition, consumption and disposal of products or services, experiences and idea. Moreover, Noel (2009: 11) said that consumer behavior is the processes related to acquisition, consumption and disposal of goods, services, activities and concepts to meet needs and desires in which the acquisition of product or good is not limited to buying only but includes bartering, leasing, and borrowing in order to obtain the products or services. This definition focuses on the process of deciding to buy, using and discarding products without specifying factors or other elements related to consumer behavior causing lack of breadth of consumer behavior.

From the meaning of consumer behavior related above, we found that the acquisition, consumption and disposal of products, activities and ideas may mean acquiring Bitcoin, investment targets in Bitcoin and includes various investment ideas. For this reason, it can be said that investing in Bitcoin is considered a form of consumption with the product as Bitcoin. Therefore, if there are various factors that influence consumers, it will result in consumers having different behaviors. In general, the factors influencing consumer behavior are internal factors which are factors that directly affect consumer decisions (Loudon and Bitta, 1988) such as motivation, personality, perception and learning which make each person wish or be a aroused to do thing to achieve

satisfaction. For example, if consumers have different investment needs they will have different investment behaviors. External factors are external conditions that influence consumer consumption behavior such as the influence of family and influence of society. These factors cause differences in consumer responses (Samithikrai, 2013). Solomon (2013: 35-37) stated that age, gender, family structure, social class, income, ethnicity, geography and lifestyle are external factors. These are geographic factors that make consumers behave differently. In addition, Khumsap (2001: 6) identified the factors that cause investors or consumers have different investment behavior as follows:

1. The age of the investor: The investors aged under 40 years old are interested in investing in securities that have potential to make money for the return on principle. For investors aged between 40-60 years old will have a family burden and often invest in securities that provide regular income. For investors aged 60 years old or over will be satisfied to invest in securities that generate a certain income.

2. Marital status and family responsibilities: The investor who has a family responsibilities such as providing education for children. Because of this, it is very necessary to invest in securities that are stable and provide certain income benefits. Those without obligations can invest in risky securities.

3. The health of investors: The health problems of investors effect investment policy of investors. Investors with health problems tend to invest in securities that provide current income rather than future income.

4. Personal habit: Investors who are thrifty do not need income from investments therefore they invest in businesses that have higher returns.

5. Willingness to accept the risks of investment: The investor who has studied the potential risks before investing and then decided to invest with readiness and confidence in risky securities such as business risks, market risk and interest rate risk, etc.

6. Investor's needs: The investor's needs may be different such as financial needs, feeling and mental state. The most important factor that encourages or drives investment is profit to collect for spending in the future or for education.

2.3 Literature Review

2.3.1 Relationship between personal factors and investment behavior

Investors have different investment behaviors as a result of different factors that influence them. Previous research found that personal factors are one of the factors related to investment behavior such as age and gender (Kabra et al., 2010), ethnicity, education and social class (Riaz et al., 2012) occupation, marital status and monthly income (Tosantikun and Gulid, 2013).

2.3.2 Factors influence investment decisions

Apart from personal factors that affect the investment behavior of investors, Lin and Lee (2004) found that the investors search for information from various sources such as the Internet, media, research, friends, family and financial experts which is consistent with Payulert and Poommipanit (2014) in Thailand who found that the reason for deciding to buy securities are information from the Internet, economic conditions, political conditions and risks. Furthermore, Poonniead (2015) found that investors consider investment advertising in various media such as television, radio and print media including the speed of service and having modern facilities to buy investment units.

2.3.3 Investment behavior

Thanyakittikul (2012) and Treetanon and Chantuk (2016) found that most investors invest for speculation and decide to invest on their own. The ratio of capital to assets is 10%-30% and accepting losses of 10%-20%. In addition, investors also monitor the performance or the status of the fund on the website of the investment company. Payulert and Poommipanit (2014) found that investors need a return that is higher than the interest rate and wish to trade securities by themselves. Moreover, Srinuan (2016) found that the source of money for investment is savings, with investors holding 3-5 securities and having an investment motivation which is the wish to increase revenue.

Moreover, the researchers divided the age range of the samples by generation, namely Generation Z: less than 23 years; Generation Y: 23-39 years; and Generation X and Baby boomers: more than 40 years.

3. Methodology

Bitcoin is a digital currency that has no legal rules to support debt payments, including trading and mining. Therefore, it is impossible to know the exact number of Thai investors who invest in Bitcoin. However, from an initial search, it was found that Bitcoin Center Thailand (https://bitcoin.co.th/) is an official organization with the objective of becoming a community that has teaching and training activities in digital currency (Cryptocurrency) both for Bitcoin and other areas such as stock, start up and so on. Therefore, this organization is an organization that collects Thai investors who invest in Bitcoin and it has as of 30 May 2018 a total of 12,880 members (Bitcoin Center Thailand). In addition to being supplied information about Bitcoin trading, the researchers were given access to the website of Bitcoin Center Thailand (https://www.facebook.com/BitcoinCenterThailand/) to post the questionnaire and invite members to complete it. The questionnaire was developed by the researcher through an examination of the validity and reliability. This research used the online survey method via the Bitcoin Center Thailand website under the Quota Sampling technique, with approximately two-thirds of the sample being male as this is the gender of most investors. When calculating the sample size (n) the error of population estimation with sample proportions not exceeding e = 0.05 with $1-\alpha$ = 0.95 by statistical formula

$$n \geq \frac{NZ^2_{\alpha/2}}{4Ne^2 + Z^2_{\alpha/2}}$$

When N is the population size (N=12,228)

$Z_{\alpha/2}$ is the percentile $(1 - \alpha/2)100$ of standard normal distribution with $1 - \alpha$ = 0.95 then $Z_{\alpha/2}$ = 1.96

So,

$$n \geq \frac{NZ^2_{\alpha/2}}{4Ne^2 + Z^2_{\alpha/2}} = \frac{12228 \times (1.96)^2}{4 \times 12228 \times (0.05)^2 + (1.96)^2} \approx 373 \text{ คน}$$

it is found that the minimum sample size is 373 and men in the sample is at least 249 (= 2 in 3 of 373 people).

It took approximately two months to conduct the survey, between September 4, 2018 and October 31, 2018. The results showed that a total of 389 Thai investors who

invested in Bitcoin responded to the survey, including 249 male investors and 140 female investors.

4. Results

4.1 Characteristic of Sample

Thai investors in Bitcoin are divided into 249 male and 140 female investors, a total of 389 or 64% and 36% respectively. Investors were aged between 23-39 years at 75.58%. Married accounted for 27.51% and 71.47% were single. Moreover, 59.64% has graduated with a bachelor's degree, with 20.31% being undergraduates. Interestingly, 38.56% were investor/business owner followed by officer at 24.68%. Most investors had an income less than 30,000 baht per month, 21.34% of investors had an income less than 15,000 baht per month, and 32.90% had an income range between 15,001-30,000 baht per month. 58.87% of investors had investment experience, 27.21% had investment experience in gold, and 26.98% had investment experience in mutual fund with an average investment experience of approximately 2.38 years. Most investors lived in Bangkok vicinity at 52.44%, and 47.56% lived in countryside, mostly in the east of Thailand.

4.2 Research Result of Investment Behavior in Bitcoin

4.2.1 Investment behavior in Bitcoin

72.75% of investors have investment objective of speculation and incremental revenue, and 57.58% have only one Bitcoin address. Moreover, they invest in Bitcoin by trading only at 58.35%, followed by mining and trading at 32.90%, and mining only at 8.74%. The top three Bitcoin wallet that are used to store Bitcoin are Web wallet, Mobile wallet and Hardware wallet (32.01%, 27.59% and 16.77%, respectively). 48.59% of investors decided to invest based on self-confidence and more than half (71.49%) invested without co-investor. Before investing in Bitcoin, investors study moderately the risk and return (48.59%). With 38.05% of investors, the proportion of initial capital used to invest compared with annual income is less than 10%. The money invested in Bitcoin for the first time is a new capital (54.76%) and the main source of capital is savings (85.35%). Investors (46.53%) expect an investment return of more than 50% and they (33.93%) can accept losses of less than 10%. From investment in the past 1 year, 24.68% of investors have moderate profit followed by low profits and par (21.08% and 20.05%, respectively)

and more than half of investors have invested in other digital currencies. Furthermore, most also invest in Ethereum (41.81%) and Litecoin (25.84%). 86.12% of investors decided to invest in Bitcoin after one year because they consider that investing in Bitcoin has a high return; however, others considered that the Bitcoin is very volatile. Investors have experience investing in Bitcoin at approximately 1.46 years. Most investors have traded Bitcoin once a week and are mining all day. In addition, the highest number of Bitcoins possessed was approximately 2.45 BTC and the current number remaining is approximately 0.81 BTC.

Moreover, the researcher also studied investment behavior classified by gender, age and occupation. The results are below.

4.2.2 Main objective of investing in Bitcoin

The study shows that more than 70% of both Thai male and female investors who invest in Bitcoin have the main objective of investing in Bitcoin for speculation and as an opportunity to increase revenue (see Table 1).

Table 1: Percentage of Investors in each age group classified by gender and main objective of investing in Bitcoin

Gender	Main Objective of Investing in Bitcoin	Age (Year)			Total
		< 23	23-39	≥ 40	
Male	For speculation/increase revenue	48.28	76.72	74.19	73.09
	For diversify investment	3.45	9.52	12.90	9.24
	For socialize/exchange news	10.34	6.35	0.00	6.02
	For fun/entertainment	17.24	3.17	0.00	4.42
	For buy/spend products	13.79	4.23	9.68	6.02
	Others	6.90	0.00	3.23	1.20
Female	For speculation/increase revenue	60.00	78.10	52.00	72.14
	For diversify investment	20.00	7.62	16.00	10.00
	For socialize/exchange news	0.00	8.57	20.11	10.00
	For fun/entertainment	20.00	0.95	0.00	2.14
	For buy/spend products	0.00	4.76	4.00	4.29
	Others	0.00	0.00	8.00	1.43
Total	For speculation/increase revenue	51.28	77.21	64.29	72.75
	For diversify investment	7.69	8.84	14.29	9.51
	For socialize/exchange news	7.69	7.14	8.93	7.46
	For fun/entertainment	17.95	2.38	0.00	3.60
	For buy/spend products	10.26	4.42	7.14	5.40
	Others	5.13	0.00	5.36	1.29

It was found that investors of all ages were motivated by speculation and the opportunity to increase revenue as the main objectives of investing in Bitcoin with investor aged between 23-39 years old at 77.21%, following by aged over 40 years old at 64.29%, and less than 23 years old at 51.28%. Interestingly, 17.95% of young investors aged not over 23 years have entertainment as the main objective of this investment, which is the highest proportion compared to other age groups who had the main purpose of diversifying investment, which is most common among people older than 40 years (14.29%).

48.28% of male investors under the age of 23 years have the main objective of investing in Bitcoin for speculation and as an opportunity to increase revenue. Also,

51.72% have different objectives, the top three of which are for fun or entertainment (17.24%), for expenditure (13.79%), and to socialize and exchange news about Bitcoin (10.34%). As for other age groups, speculation and the opportunity to increase revenue are the main objectives. In contrast, female investors at all ages had the main objectives of investing in Bitcoin because of speculation and as an opportunity to increase revenue as shown in Table 1.

Table 2: Percentage of Investors in Each Occupation Classified by Gender and Main Objective of Investing in Bitcoin

Gender	Main Objective of Investing in Bitcoin	Occupation					Total
		Student	Bureaucrat /State Enterprise	Officer	Investor/ Business Owner	Retired and Others	
Male	For speculation/increase revenue	51.61	83.72	69.70	76.47	79.17	73.09
	For diversify investment	12.90	0.00	15.15	10.59	0.00	9.24
	For socialize/exchange news	6.45	16.28	7.58	0.00	4.17	6.02
	For fun/entertainment	16.13	0.00	0.00	4.71	8.33	4.42
	For buy/spend products	6.45	0.00	7.58	7.06	8.33	6.02
	Others	6.45	0.00	0.00	1.18	0.00	1.20
Female	For speculation/increase revenue	70.59	85.71	73.33	75.38	57.14	72.14
	For diversify investment	11.76	0.00	6.67	9.23	19.05	10.00
	For socialize/exchange news	0.00	14.29	10.00	7.69	23.81	10.00
	For fun/entertainment	17.56	0.00	0.00	0.00	0.00	2.14
	For buy/spend products	0.00	0.00	10.00	4.62	0.00	4.29
	Others	0.00	0.00	0.00	3.08	0.00	1.43
Total	For speculation/increase revenue	58.33	84.00	70.83	76.00	68.89	72.75
	For diversify investment	12.50	0.00	12.50	10.00	8.89	9.51
	For socialize/exchange news	4.17	16.00	8.33	3.33	13.33	7.46
	For fun/entertainment	16.67	0.00	0.00	2.67	4.44	3.60
	For buy/spend products	4.17	0.00	8.33	6.00	4.44	5.40
	Others	4.17	0.00	0.00	2.00	0.00	1.29

When considering the main objective of investing in Bitcoin according to the investor's career, most investors in all careers invest in Bitcoin for speculation and increasing revenue. Noticeably, the investment in Bitcoin for fun and entertainment is most common among investors who are students (16.67%), which is the highest proportion compared to other occupations. While investing in Bitcoin for socialize and exchange Bitcoin news is most common in bureaucrat and state enterprise (16.00%). See Table 2.

4.2.3 The Method Used to Invest in Bitcoin

There are three ways to invest in Bitcoin: mining only, trading for speculation only and both mining and trading for speculation. The results of the study show that less than 10% of investors were only mining and more than half (58.35%) traded for speculation only as shown in Table 3.

Table 3: Percentage of Investors in Each Age Group Classified by Gender and the Method Used to Invest in Bitcoin

Gender	The Method Used to Invest in Bitcoin	Age (Year)			Total
		< 23	23-39	≥ 40	
Male	Mining	3.45	12.70	9.68	11.24
	Trading	62.07	42.86	54.84	46.59
	Mining and Trading	34.48	44.44	35.48	42.17
Female	Mining	10.00	2.86	8.00	4.29
	Trading	80.00	77.14	88.00	79.29
	Mining and Trading	10.00	20.00	8.00	16.43
Total	Mining	5.13	9.18	8.93	8.74
	Trading	66.67	55.10	69.64	58.35
	Mining and Trading	28.21	35.71	21.43	32.90

The percentage of female investor who invested in Bitcoin by mining only is less than 5%. However, almost 80% invest in Bitcoin because of trading for speculation. Moreover, 46.59% of male investors trade for speculation only, followed by 42.17% of male investors mining and trading for speculation, and 11.24% male investors who invest by mining only. It was found that more than 70% of female investors of all ages invest by trading only. In contrast, although male investors aged less than 23 years old

mostly invest in Bitcoin by trading for speculation at 62.07%, male investors ranged between 23-39 years old and 40 years old or more invest by trading for speculation only in a proportion that is slightly different from invest by both mining and trading for speculation (Table 3).

When considered by occupation, it was found that 16% of bureaucrat and state enterprise invested in Bitcoin by mining only, which is considered higher than other occupations. Moreover, 40% and 44% of investors invested in Bitcoin by trading for speculation only following by both mining and trading for speculation respectively. As for investors with other occupations, students, officers or private investors (64.58%, 61.46% and 57.33% respectively) invest in Bitcoin by trading for speculation only as shown in Table 4.

Table 4: Percentage of Investors in Each Occupation Classified by Gender and the Method Used to Invest in Bitcoin

Gender	The Method Used to Invest in Bitcoin	Occupation					Total
		Student	Bureaucrat/ State Enterprise	Officer	Investor/ Business Owner	Others	
Male	Mining	9.68	18.60	6.06	12.94	8.33	11.24
	Trading	54.84	34.88	54.55	43.53	45.83	46.59
	Mining and Trading	35.48	46.51	39.39	43.53	45.83	42.17
Female	Mining	11.76	0.00	0.00	6.15	0.00	4.29
	Trading	82.35	71.43	76.67	75.38	95.24	79.29
	Mining and Trading	5.88	28.57	23.33	18.46	4.76	16.43
Total	Mining	10.42	16.00	4.17	10.00	4.44	8.74
	Trading	64.58	40.00	61.46	57.33	68.89	58.35
	Mining and Trading	25.00	44.00	34.38	32.67	26.67	32.90

4.2.4 People who influence you to invest in Bitcoin

Regarding those who influenced investors' decisions, it was found that most male and female investors invested by themselves followed by analysts/media as shown in Table 5.

Table 5: Percentage of Investors in Each Age Group Classified by Gender and Influence on Investment Decisions in Bitcoin

Gender	People Who Influence You to Invest in Bitcoin	Age (Year)			Total
		< 23	23-39	≥ 40	
Male	Friend	3.45	17.99	16.13	16.06
	Myself	58.62	50.79	41.94	50.60
	Analyst/Media	37.93	29.10	35.48	30.92
	Others	0.00	2.12	6.45	2.41
Female	Friend	10.00	19.05	12.00	17.14
	Myself	30.00	45.71	48.00	45.00
	Analyst/Media	60.00	34.29	40.00	37.14
	Others	0.00	0.95	0.00	0.71
Total	Friend	5.13	18.37	14.29	16.45
	Myself	51.28	48.98	44.64	48.59
	Analyst/Media	43.59	30.95	37.50	33.16
	Others	0.00	1.70	3.57	1.80

When considering the influence of investment decisions on Bitcoin classified by age, most investors in all ages decided to invest based on self-confidence, followed by analyst/media at the same proportion. Furthermore, male investors of all ages mostly have confidence in themselves which is different from female investors who are younger than 23 years old. 60% of analysts/media can influence investment decisions while other age groups still invest by self-confidence as shown in Table 5.

Table 6: Percentage of Investors in Each Occupation Classified by Gender and Influence on Investment Decisions in Bitcoin

Gender	People Who Influence You to Invest in Bitcoin	Occupation					Total
		Student	Bureaucrat/ State Enterprise	Officer	Investor/ Business Owner	Others	
Male	Friend	19.35	11.63	31.82	3.53	20.83	16.06
	Myself	51.61	32.56	46.97	61.18	54.17	50.60
	Analyst/Media	29.03	53.49	15.15	35.29	20.83	30.92
	Others	0.00	2.33	6.06	0.00	4.17	2.41
Female	Friend	23.53	42.86	30.00	9.23	9.52	17.14
	Myself	29.41	42.86	33.33	50.77	57.14	45.00
	Analyst/Media	47.06	14.29	33.33	40.00	33.33	37.14
	Others	0.00	0.00	3.34	0.00	0.00	0.71
Total	Friend	20.83	16.00	31.25	6.00	15.56	16.45
	Myself	43.75	34.00	42.71	56.67	55.56	48.59
	Analyst/Media	35.42	48.00	20.83	37.33	26.67	33.16
	Others	0.00	2.00	5.21	0.00	2.22	1.80

When considering the influence of investment decision on Bitcoin classified by occupation it was found that bureaucrat and state enterprise consider investment based on analyst and media the most at 48% which is the highest proportion. Other occupations, whether students, officers and business owner (43.75%, 42.71% and 56.67% respectively) invested by self-confidence. The details shown in Table 6.

4.2.5 Investment experience in Bitcoin, The highest Bitcoin possessed (BTC) and Current remaining Bitcoin (BTC)

Thai investors, both male and female, have investment experience in Bitcoin approximately 1.4 years. Male investors have the highest Bitcoin average of 2.85 BTC and the current remaining Bitcoin is 0.89 BTC, which is more than female investors who have an average of 1.97 BTC and current remaining Bitcoin of 0.66 BTC as shown in Table 7.

Table 7: Mean and Standard Deviation in Each Age Group Classified by Gender and Investment Behavior

Gender	Investment Behavior	Age (Year)			total[1]
		< 23	23-39	≥ 40	
Male	Investment experience in Bitcoin (year)	1.60	1.44	1.48	1.47
		(0.91)	(1.06)	(0.68)	(1.00)
	Highest Bitcoin possessed (BTC)	3.11	2.93	2.11	2.85
		(4.31)	(5.67)	(2.50)	(5.22)
	Current Bitcoin remaining (BTC)	0.87	0.95	0.58	0.89
		(1.05)	(2.77)	(0.91)	(2.46)
Female	Investment experience in Bitcoin (year)	1.85	1.44	1.36	1.45
		(1.24)	(0.96)	(0.57)	(0.93)
	Highest Bitcoin possessed (BTC)	2.45	2.18	0.92	1.97
		(3.77)	(3.96)	(1.72)	(3.67)
	Current Bitcoin remaining (BTC)	0.16	0.83	0.14	0.66
		(0.31)	(2.04)	(0.60)	(1.81)
Total	Investment experience in Bitcoin (year)	1.67	1.44	1.43	1.46
		(0.99)	(1.02)	(0.63)	(0.97)
	Highest Bitcoin possessed (BTC)	2.94	2.66	1.58	2.54
		(4.14)	(5.13)	(2.25)	(4.74)
	Current Bitcoin remaining (BTC)	0.69	0.90	0.38	0.81
		(0.99)	(2.53)	(0.81)	(2.25)

Note: Values in parentheses are standard deviation

[1] Show the hypothesis test of investment behavior compared between different ages

* p-value < 0.05 ** p-value < 0.01 *** p-value < 0.001

Overall, investors of all ages have similar investment experience in Bitcoin (1.67 years, 1.44 years and 1.43 years, respectively), while investors younger than 23 years have the highest amount of Bitcoin possession at 2.49 BTC. On the other hand, it was found that the investors aged 23-39 years had the largest amount of Bitcoin remaining today and this was the case with both males and females. However, when testing the differences in investment behavior compared between age groups, both in total and gender classification, it was found that there were no significance (Table 7).

Table 8: Mean and Standard Deviation in Each Occupation Group Classified by Gender and Investment Behavior

Gender	Investment Behavior	Occupation					Total[1]
		Student	Bureaucrat/ State Enterprise	Officer	Investor/ Business Owner	Others	
Male	Investment experience in Bitcoin (year)	1.23 (0.64)	1.16 (0.37)	1.23 (0.66)	1.88 (1.41)	1.54 (0.71)	1.47** (1.00)
	Highest Bitcoin possessed (BTC)	2.98 (4.61)	2.58 (5.19)	1.02 (1.31)	4.86 (7.08)	1.07 (1.21)	2.85 (5.22)
	Current Bitcoin remaining (BTC)	0.38 (0.53)	1.07 (2.88)	0.21 (0.34)	1.52 (3.50)	0.87 (1.12)	0.89* (2.46)
Female	Investment experience in Bitcoin (year)	1.29 (0.83)	1.57 (0.53)	1.17 (0.58)	1.50 (0.79)	1.81 (1.60)	1.45 (0.93)
	Highest Bitcoin possessed (BTC)	1.35 (2.43)	1.18 (0.83)	1.83 (3.36)	2.56 (4.47)	1.16 (2.42)	1.98 (3.67)
	Current Bitcoin remaining (BTC)	0.20 (0.30)	0.06 (0.07)	1.31 (3.12)	0.65 (1.50)	0.31 (0.57)	0.66 (1.81)
Total	Investment experience in Bitcoin (year)	1.25 (0.70)	1.22 (0.42)	1.21 (0.63)	1.71 (1.19)	1.67 (1.20)	1.46*** (0.97)
	Highest Bitcoin possessed (BTC)	2.41 (4.02)	2.38 (4.84)	1.28 (2.18)	3.86 (6.18)	1.11 (1.85)	2.54* (4.74)
	Current Bitcoin remaining (BTC)	0.32 (0.46)	0.93 (2.69)	0.55 (1.82)	1.15 (2.84)	0.61 (0.94)	0.81 (2.25)

Note: Values in parentheses are standard deviation.

[1] Show the hypothesis test of investment behavior compared between different occupation.

*p-value < 0.05 **p-value < 0.01 ***p-value < 0.001

When classified by occupation, it was found that investors with investor/business owner have experience of investing in Bitcoin, the highest amount of Bitcoin ever possessed, and the current Bitcoin remaining at average of 1.71 years, 3.86 BTC and 1.15 BTC, respectively. Moreover, investors with different occupations have different investment behavior in terms of investment experience in Bitcoin and the amount of Bitcoin that they have possessed the most. Likewise, male investors with a career as an investor/business owner have the highest average investment behavior (1.88 years, 4.86BTC and 1.52 BTC, respectively) and statistical tests found that the investment experience in Bitcoin and the current Bitcoin remaining of male investors in each profession are actually different. On the other hand, for female investors, all three investment behaviors are not different as shown in Table 8.

5. Conclusion and Discussion

In this research Thais who invest in Bitcoin are mostly single, graduated with a bachelor's degree, have a career as an investor/business owner causing more than half of them have experience in investment before investing in Bitcoin and have invested in gold and mutual funds. Most are domiciled in Bangkok and its vicinity because and can access information and exchange of goods and services with cryptocurrency more easily than those in other provinces.

Investors with the main purpose of investing in Bitcoin for fun or entertainment are often investors who are younger than 23 years old or investors who are students because this group is curious and want to do new things. Investors aged between 23-39 years old have self-confidence and are interested to invest in securities with high returns. Therefore, they are more likely to invest for speculative purposes in investments that have an opportunity to increase revenue, which corresponds to finding of Khumsap (2001) and Srinuan (2016). While investors aged more than 40 years old are most likely to invest in Bitcoin to diversify their investment because of these investors are going to retire and want to make money in order to spend in the future and not have their capital eroded by inflation. Therefore, they want to diversify investments to reduce the aforementioned risks.

Most investors invest in Bitcoin trading for speculation only because it is an easy investment method and the cost is not as high as the investment by mining, a finding

which is in accordance with Glaser et al. (2014). The investors who invest by mining are mostly male rather than female because male investors usually have more understanding of technology. Moreover, it was also found that most investors of all ages and all occupations decided to invest on their own followed by making investment decision based on analyst and media which is consistent with Lin and Lee (2004). In contrast, Payulert and Poommipanit (2014) and Poonniead (2015) found that investors pay more attention to and take into consideration advertising in various media such as television, radio and publications.

The investment experience of Bitcoin of investors in each age group is similar. Investors under the age of 23 are the group of investor that has possessed the highest amount of Bitcoin. On the other hand, investors with the largest remaining Bitcoin are investors aged 23-39 years old. When considering the career of the investor, we found that investor/business owner have the highest experience of investment in Bitcoin, the number of Bitcoin that has been possessed, and the number of current Bitcoin remaining. We also found that investors with different occupations have different investment behaviors which corresponds to Tosantikun and Gulid (2013).

6. Recommendations

Policy Suggestion

Based on these findings, the profile of Bitcoin investors such as age, gender and occupation, has an effect on Bitcoin investment, which can be used for marketing planning in Bitcoin trading activities. Moreover, Bitcoin and other Cryptocurrencies will be more important in the future and is also a currency type that has received interest from investors because it is an easy investment channel and can also help diversify investments. Although regulations have supported investment in such assets they are not fully covered, therefore the risk of investment is high. For this reason, in the long term, those involved in the public sector should study and cooperate with the private sector in order to have more understanding and take concrete measures for digital currency in order to prepare for potential impacts. Moreover, they should have more policies to promote education in finance and investment from secondary school, for example, including the subject of investment as a part of the school curriculum, so that the Thai population will have a better understanding of investment, investment risks and financial planning.

In the short term, they should promote and support organizations that provide investment and digital currency knowledge such as the Bitcoin Center Thailand to provide information and training in investment for investors. Those considering investing in Bitcoin should study the available information thoroughly before investing and invest with caution due to the volatility of the Bitcoin price and possibility of investment fraud such as schemes offering very high returns in the short time and Ponzi schemes because the damaged investor may not be protected as Bitcoin is not certified as a legitimate asset and cannot be compensated for under Thai law.

Recommendations for Further Research

1. Future research should study the clustering of Thai investors by investment behavior in Bitcoin which may specify the type of investors such as Individualistic, Methodological, Cautious and Spontaneous and study the characteristics of investors in each group to collect more clear information.

2. Questions should be added in the questionnaire about the date and time of purchasing Bitcoin in order to specify the price of Bitcoin that the respondent bought and identify investment motivation.

3. Questions about gold investment should be added to compare differences in investment behavior between the two assets.

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Structural Issues Confronting China's Third-front Resource-based Cities during the Period of Industrial Transformation: A Case Study of Panzhihua City

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Abstract

China's Third-front Construction was an immense movement which had a substantial influence on the country. The movement had two significant impacts on China, firstly, it improved the country's strategic industrial structure; secondly, it enhanced China's national defense industries. However, the decline of Third-front Enterprises and Third-front Resource-based Cities was due not only to economic causes but also political causes. Through a case study of typical Third-front Enterprises and a typical Third-front Resource-based City, Panzhihua city, Sichuan Province, that includes 13 in-depth interviews and 331 questionnaires, it was found that there were three structural problems encountered in the transformation of Third-front Resource-based Cities, namely: the locational disadvantage resulting from locating industry in remote areas; the operational disadvantage caused by poor management; and the market disadvantage caused by institutional issues. The situation was the result of the conflict of the three dichotomies of ideas, namely, war and peace; planned economy and market economy; and public ownership and private ownership.

Keywords: Third-front Construction, China's Resource-based Cities, Industrial Transformation

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ปัญหาเชิงโครงสร้างที่ประสบโดยเมืองที่อาศัยทรัพยากรเป็นฐานในพื้นที่ด้านในของประเทศจีนในช่วงเวลาของการปฏิรูปอุตสาหกรรม: กรณีศึกษาของเมืองพานจือฮัว

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รับวันที่ 20 กุมภาพันธ์ 2562 ส่งแก้ไขวันที่ 13 ธันวาคม 2562 ตอบรับตีพิมพ์วันที่ 16 มีนาคม 2563

บทคัดย่อ

การก่อสร้างในพื้นที่ด้านในของประเทศจีน นับเป็นความเคลื่อนไหวอย่างมโหฬารที่มีอิทธิพลอย่างมากต่อประเทศ ความเคลื่อนไหวดังกล่าวมีผลกระทบสำคัญสองประการต่อประเทศจีน ประการแรก เป็นการปรับปรุงโครงสร้างของอุตสาหกรรมเชิงกลยุทธ์ของประเทศ และประการที่สองเป็นการขยายอุตสาหกรรมการป้องกันประเทศของจีน อย่างไรก็ตาม การถดถอยของวิสาหกิจในพื้นที่ด้านในและเมืองที่อาศัยทรัพยากรเป็นฐานในพื้นที่ด้านใน ไม่ได้เกิดจากเหตุผลทางเศรษฐกิจเท่านั้น แต่เกิดจากเหตุผลทางการเมืองด้วย จากกรณีศึกษาของตัวอย่างวิสาหกิจในพื้นที่ด้านใน และตัวอย่างเมืองที่อาศัยทรัพยากรเป็นฐานในพื้นที่ด้านใน คือ เมืองพานจือฮัว มณฑลเสฉวน ที่ครอบคลุมการสัมภาษณ์เชิงลึก 13 ราย และแบบสอบถาม 331 ราย พบว่า การปฏิรูปของเมืองที่อาศัยทรัพยากรเป็นฐานในพื้นที่ด้านใน ประสบปัญหาเชิงโครงสร้างสามประการ กล่าวคือ ความเสียเปรียบ ด้านพื้นที่ ซึ่งเกิดจากการไปตั้งอุตสาหกรรมในพื้นที่ห่างไกล ความเสียเปรียบด้านการดำเนินงาน ซึ่งเกิดจากการบริหารจัดการที่ไม่มีประสิทธิภาพ และความเสียเปรียบด้านการตลาด ที่เกิดจากประเด็นด้านสถาบัน สถานการณ์ดังกล่าวเกิดจากความขัดแย้งของการแบ่งขั้วของสามแนวคิด คือ สงครามและสันติภาพ เศรษฐกิจแบบวางแผนและเศรษฐกิจแบบตลาด และหน่วยงานธุรกิจของรัฐและหน่วยงานธุรกิจของเอกชน

คำสำคัญ: การพัฒนามณฑลด้านในของจีน เมืองที่อาศัยทรัพยากรเป็นฐานของประเทศจีน การปฏิรูปอุตสาหกรรม

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1. Introduction

Third-front Construction took place from the mid-1960s to the end of 1970 in China. The large-scale adjustment of the strategic distribution of industry was undertaken in response to the need for national defense readiness. The major motivation for the implementation of this large-scale modern industrial system was because of the imminent threat of war (Youwei & Xi, 2015). In terms of China's industrial distribution and national defense construction, Third-front Construction has exerted a profound influence on China and the world.

First, Third-front Construction has improved China's industrial structure and promoted the long-term development of China's economy (Caihua, 2011). The economic development of regions in China was uneven before the founding of the People's Republic of China (PRC) with more than 70% of the industries being concentrated in the eastern regions which account for less than 12% of the PRC's land area (Haitao, 2011). To address this situation, the government invested 205.268 billion yuan (approximately US$29.188 billion) in the Third-front Construction areas, accounting for 39.01% of national investment for the period from 1965 to 1980. The original value of industrial fixed assets in the Third-front Construction areas increased from 28.681 billion yuan (approximately US$4.078 billion) to 143.598 billion yuan (approximately US$20.419 billion), a five-fold increase, and an increase from 29.12% to 38.5% of the proportion of the national total (Division of Fixed Assets Investment of National Statistics Bureau, 1997:78-83).

Secondly, Third-front Construction altered the overall situation of China's national defense industry and basically established a relatively complete national defense industry system. When the PRC was established in 1949, China's defense industry was fragile and consisted of only 76 defense enterprises which included: 45 arsenals, 6 aviation center repair factories, 17 radio equipment factories, and 8 ship repair factories (Guang, 1992). Moreover, these factories were equipped with antiquated technology and simple equipment in poor condition unable to deal with the routine maintenance of heavy equipment such as warships, manufacture aircraft, and only able to manufacture basic weaponry (Xiaoyong & Li, 2016). The Third-front Construction established a comprehensive defense industry system in China's inland areas, ranging from the production of conventional weapons to missiles and nuclear weapons, laying the foundation for China to face the various complex international situations confronting it at that time (Quanshan, 2011).

Third-front Resource-based Cities were established due to Third-front Construction Projects, developing over decades of vigorous construction during which they encountered a range of structural problems to various degrees. These local issues have increasingly become a major practical problem facing the entire nation. The impact of the Third-front Construction on society has been far-reaching and the transformation of these Resource-based Cities has been important in the social development of China.

2. Literature Review

Industrialization in China has comparatively late beginnings and, correspondingly, issues related to Resource-based Cities as well as other issues seem to have occurred later than similar issues that arose in some Western countries. Likewise, academic research on the transformation of Resource-based Cities in China only began decades later than similar research by academics in the West.

2.1 Academic Research on the Transformation of Resource-based Cities in China

Previous research on the transformation of Resource-based Cities were conducted from many perspectives such as spatial distribution, historical development, economic geography, industrial structure, system of government, development patterns, and so forth (e.g., Bo & Xvhui, 2018; Changhong, 2010; Huijuan, Ruyi, & Hong, 2013; Liping, 2017; Lvhong, 2014; Xiangang & Cunru, 2018; Xuejie, Li, & Xiaolei, 2008; Xuexin, Guangzeng, & Changhong, 2010). For example, Liping (2017) pointed out that the current spatial distribution of Resource-based Cities was characterized by nationwide distribution, spatial non-equilibrium distribution, and regional agglomeration distribution. Meanwhile, Xuexin et al. (2010) considered that the time, degree, potential, and evolution of regional central cities are insufficient in theory, and need to be further investigated.

From the perspective of overall development, the economic development conditions of Resource-based Cities have inherent advantages as well as deficiencies. Comprehensive transformation is the focus of China's current economic development. The main manifestations are as follows: firstly, in ancient China, priority was given to the development of political centers, and it was difficult for Resource-based Cities to fully develop. Secondly, in modern China from 1840-1949, due to the background of foreign aggression and extended periods of warfare, the development of most Resource-based

Cities was closely related to the ongoing conflicts which restricted their development to some extent. Thirdly, from 1949 to 1978, due to the influence of internal politics and the Cold War, the overall development of the Chinese cities was warped, greatly limiting the comprehensive and full development of Resource-based Cities. Finally, from 1978 to the present, Chinese society entered a stage of comprehensive transformation, and the amount of resources that can be mined has rapidly increased, and many Resource-based Cities have entered a stage of comprehensive transformation (Lvhong, 2014).

There are significant differences in green transformation benefits between different cities, and there are obvious imbalances. Specifically, the green transition of some cities (such as Zaozhuang City, Shandong Province; and Jiaozuo City, Henan Province) is more rapid than the national average, while the transition of others (such as Fushun City, Liaoning Province; and Shuangya City, Heilongjiang Province) has comparatively been lagging behind (Xiangang & Cunru, 2018). At present, the transformation of China's Resource-based Cities is not focused on economic geology, which requires the application of economic principles to the value, cost, long-term investment, reserves, distribution, ownership, international circulation of minerals, and the comprehensive study of these geographical elements. Instead, China's Resource-based Cities are paying more attention to basic factors such as resource type, scale, production method, and resource mining life cycle. Due to the lack of economic geological perspective, the development of Resource-based Cities does not rely on resources, extend resources, surpass resources, or the promotion of industrial diversification (Xuejie et al., 2008).

The structural growth of industries usually reflects the changing trends caused by the varying levels of rising and falling demand between the different industries, potentially reflecting the inherent driving force of industrial development in the overall economic system, and the direct value-added rate is used to examine whether the various industries in the city are experiencing structural growth issues. From the perspective of industrial structural growth, China's current Resource-based Cities lack the emphasis on increasing the direct value-added rate and ignore the related effects of downstream industries (Jiangsu & Zhipeng, 2017). Based on an analysis of data on 107 Resource-based Cities in the National Resource-Based City Sustainable Development Plan (2013-2020) issued by China's National Development and Reform Commission in 2012, the development of service industry conditions that play an important role in

the transformation of Resource-based Cities, although conforming to the general law of industrial evolution, lags behind the overall development of China's service industry. The development of different types of Resource-based Cities' service industry demonstrates the different characteristics related to regional distribution, city type, economic growth rate, and industrialization stage (Bo & Xvhui, 2018).

The main reasons that cause Resource-based Cities to lag behind other cities are the continued influence of the planned economy (such as the planned economic model's exclusion of market competition), and unreasonable tax systems (e.g., the government's tax system is obviously more conducive to state-owned enterprises rather than conducive to the development of non-state-owned enterprises), poor planning and misguided resource development policies (e.g., policies for the pursuit of maximizing economic benefits that lead to over-exploitation of resources while neglecting environmental protection) (Huijuan et al., 2013).

The traditional development model that Resource-based Cities are facing many challenges. Multiple superimposed development problems confronting resource-based society are gradually emerging such as the lack of a market mechanism, and also the development energies of market players are insufficient. Specific manifestations are: China's current environmental carrying capacity has reached or is approaching the upper limit, and many Resource-based Cities will face the problem of resource exhaustion. Meanwhile, China's economy is at a stage of shifting gears and changing its growth mode, structural adjustments, analgesia, and other adjustments. The travails of structural adjustment and the vitality stimulated by the reform are intertwined. The weakening of traditional growth engines coexists with the vigorous development of emerging industries.

Most of China's Resource-based Cities developed in the era of the planned economy, which has a strong brand. The government dominates the development of the urban economy. Most major enterprises in cities are state-owned. The development of state-owned enterprise has severely limited the development of other types of industries (such as private enterprises), making it difficult for non-state-owned enterprises to become active and grow. As a result, the spontaneous role of the market mechanism cannot be fully exerted. Under this mechanism, people's ideas and thoughts are also bound to a certain degree, which inhibits the creation of pioneering and innovative

thinking. At the same time, in Resource-based Cities, as the resource-based industry is dominant due to the excessive development of resource-based industry, innovation is also inhibited to a certain extent, resulting in a lack of innovation momentum (Caixia, 2016).

The previous academic research on the transformation of China's general Resource-based Cities has been comprehensive, both in terms of depth and breadth, and has entered a relatively mature stage. However, among the vast number of Resource-based Cities, there exists a unique group of cities known as the Third-front Resource-based Cities, which are obviously different from the general Resource-based Cities in terms of the emergence of cities and their management and operation. If we ignore the difference between Third-front Resource-based Cities and general Resource-based Cities, it would be difficult to explain why Third-front Resource-based Cities remain locked in a stage of transition. However, at present, the academic research on the transformation of a large number of Third-front Resource-based Cities is still at the initial stage. Therefore, this researcher wishes to answer the research question: What is difference between Third-front Resource-based Cities and general Resource-based Cities?

2.2 Characteristics of Third-front Resource-based Cities

While the current research on the transformation of China's Resource-based Cities has entered a mature stage, research into the transition problem facing many Third-front Resource-based Cities remains at the first stage. At present, there are 262 Resource-based Cities (General Office of the State Council, 2013), with 144 cities in 13 provinces of Third-front Construction, accounting for 55.73% of all Resource-based Cities; and 65 Resource-based Cities are in prefecture-levels, accounting for 51.59% of 126 Resource-based prefecture-level Cities (See Table 1). From the point of view of both city site layout and production operation, Third-front Resource-based Cities have obvious differences from general Resource-based Cities.

2.2.1 Third-front Resource-based Cities follow a unique strategic layout principle in the stage of urban site selection

Considering the preparation for war, the Third-front Construction Projects follow the principle of "relying on mountains, dispersing and concealing." The most fundamental

starting point of this layout lies in "adapting to the characteristics of modern warfare, not breaking with or destroying in a thermonuclear war, and insisting on production cooperation in peacetime and wartime to make sure wartime needs" (Donglin, 2003). As the Third-front Resource-based Cities were built because of the Third-front Projects, most are far from the central cities and have lack transportation infrastructure. All these characteristics are different from the general Resource-based Cities which are mostly close to the source of resources. Third-front Resource-based Cities were conceived of and built as part of an overall war preparation and security standpoint, while the general Resource-based Cities have been mostly developed as a result of economic interest.

2.2.2 Unique operation models in the process of construction of Third-front Resource-based Cities

Third-front Construction began under enormous pressure exerted by the need to build national defenses, thus it was inevitable that the high efficiency of construction projects would be pursued. A militarized management system was implemented during the construction process, actively advocating national support for Third-front Construction, arranging for old industrial bases to drive new industrial bases, old industrial and mining enterprises to drive new mining enterprises, experienced old workers to lead new workers, and concentrating on the spirit of cooperation in fighting the war of annihilation (Donglin, 2003: 163).

The military-style nature of the Third-front Enterprise management model has also had a greater impact on Third-front Resource-based Cities because most Third-front Projects were key projects of the Third-front Construction at that time. Some of the Third-front Resource-based Cities were projects first, then cities. Those cities (e.g., Panzhihua city) initially carried out the management model of government-enterprise integration (Yougui & Hongchun, 2013: 59). After the establishment of the city, the key to urban management was the Third-front Construction Projects for a long period of time. Providing administrative support to Third-front Enterprises was one of the most important tasks in Third-front Cities after their establishment. Because Third-front Construction was China's national strategy at that time, every Third-front Resource-based City was under the unified management of the central government of PRC and had little autonomy. Therefore, the political and military significance of the movement was greater than

the economic significance. However, the movement of general Resource-based Cities is different from other cities, and most were more closely related to economic interests.

2.2.3 Third-front Resource-based Cities encounter unique difficulties during the period of adjustment and transformation

After the beginning in 1978 of the period of reform and opening up, the state shifted its focus to the eastern coastal areas, reducing investment in Third-front Construction Projects, many of which began to experience difficulties. Meanwhile, many Third-front Resource-based Cities with Third-front Projects as independent industries were also faced with major structural problems. In particularly, the location of the cities has not been conducive to the development of a market economy. Furthermore, the products produced by Third-front Enterprises are mostly for military and heavy industry, which are highly dependent on national planning orders (Donglin, 2003: 393). Once the central government reduced orders, these enterprises immediately fell into difficulties and the cities that relied mainly on these enterprises experienced concomitant difficulties. On the other hand, the crisis facing general Resource-based Cities generally is the result of resource exhaustion, overcapacity, lagging capacity, and other economic-related reasons.

Because of the great difference between Third-front Resource-based Cities and general Resource-based Cities, the difficulties encountered by the former in the process of transformation is very different from those of the latter. Thus, this study focuses on the differences between the two.

3. Research Methodology

3.1 Research Sites and Objects

The researcher selected Panzhihua city, Sichuan Province, China as the research site, and took Panzhihua city as the main object because Panzhihua city is a typical Third-front Resource-based City comparable to other Third-front Resource-based Cities. Also, Panzhihua city has rich natural resources and is in a special zone of China's Third-front Construction.

Table 1: List of Resource-based Cities in 13 Provinces of the Third-front Construction in China (Only Part of Prefecture-level Cities are Present)

Provincial Area	City Quantity	Prefecture Level City Name	Provincial Area	City Quantity	Prefecture Level City Name
Sichuan province	10	Panzhihua, Guangyuan, Guangan, Nanchong, Luzhou, Zigong, Daxian, Ya'an, Liangshan Yi Autonomous Region, Aba Tibetan and Qiang Autonomous Region	Henan province	7	Sanmenxia, Luoyang, Jiaozuo, Hebi,Puyang, Pingdingshan, Nanyang
Guizhou province	5	Liupanshui, Anshun, Bijie, Buyi and Miao Autonomous Region in Southern Guizhou, Buyi and Miao Autonomous Region in Southwestern Guizhou	Guangdong province	2	Shaoguan, Yunfu
Yunnan province	7	Qujing, Baoshan, Zhaotong, Lijiang, Puer, Lincang, Chuxiong Yi Autonomous Region	Shanxi province	10	Datong, Shuozhou, Yangquan, Changzhi, Jincheng, Xinzhou, Jinzhong, Linfen, Yuncheng, Lvliang
Shaanxi province	6	Yan'an, Tongchuan, Weinan, Xianyang, Baoji, Yulin	Hubei province	2	Ezhou, Huangshi
Gansu province	7	Jinchang, Baiyin, Wuwei, Zhangye, Qingyang, Pingliang, Longnan	Hunan province	4	Hengyang, Chenzhou, Shaoyang, Loudi
Ningxia Hui Autonomous region	1	Shizuishan	Guangxi Zhuang Autonomous region	3	Baise, Hechi, Hezhou
Qinghai province	1	Mongolian and Tibetan Autonomous Region of Haixi			

Source: National Resource-Cities Sustainable Development Plan 2013-2020

Panzhihua city is a Third-front special economic zone, is located in the southwest of China in Sichuan, bordering Yunnan (see Figure 1). It is located in the deep mountains and is rich in natural resources. It boosts that it is "the future industrial prefecture" and "the capital of vanadium and titanium in China." It is one of China's most resource rich areas. At present, 76 types of minerals have been found in Panzhihua city. For example, iron reserves account for 16% of China's total iron reserves; while vanadium-titanium reserves account for 59% and 93% of the world's total and China's total respectively. Moreover, it has more than 20 precious metals, such as cobalt, nickel, and chromium; and has coal reserves of 560 million tons. Non-ferrous metals such as lead, zinc, and copper are also stored and non-metallic minerals such as granite, limestone, and clay ore are also plentiful (Yougui & Hongchun, 2013: 19).

Figure 1: Panzhihua Administrative District Map
Source: People's Government of Panzhihua Municipal

Because of these innate advantages, the Central Committee of the Communist Party of China (CPC) and the State Council officially issued the "Approval for the Establishment of the People's Committee of Panzhihua Special Zone" on February 2, 1965 which designated Panzhihua as a special zone for Third-front Construction (Yougui & Hongchun, 2013: 59). In the spring of 1965, Panzhihua Iron and Steel Company, together with Chengkun Railway, Liupanshui and other projects were initiated as part of the first

batch of Third-front Construction Projects in China (Donglin, 2003: 126). For the planning of Panzhihua, Mao Zedong–the supreme leader of Third-front Construction–declared the strategic design of "Two Points and One Line." That is, making Panzhihua as the center, with a pendulum swinging to Chongqing and Liupanshui via the Chengdu-Kunming Railway, transporting coal from Liupanshui to Panzhihua, steel from Panzhihua to Chongqing, and machinery from Chongqing to Panzhihua and Liupanshui (Yougui & Hongchun, 2013: 9). This strategic design shows the importance of Panzhihua in the Third-front Construction Projects. China's national leaders imagined that if a serious situation such as the Sino-Japan War (1937-1945) were to happen again and a large area of land were to fall into enemy hands, they would be able to retreat to the southwest corner and become a "Micro-China" that would still be self-sufficient, able to defend itself and eventually able to counter-attack (Yougui & Hongchun, 2013: 79). From this point of view, the Third-front Area centered on Panzhihua city was considered to be the potential last hope of the most critical moment of China's national destiny.

Secondly, Panzhihua city has made remarkable achievements in Third-front Construction and has become prominent in the Third-front Resource-based City. Panzhihua city, as a model of the achievements of the Third-front Construction, was built in the autumn of 1964. By 1970, iron was being produced, steel was produced from 1971 and hot-rolled steel was successfully rolled in 1974. Panzhihua Iron and Steel Company began to cast its own glorious history step by step. From 1964 to 1978, Panzhihua Iron and Steel Company increased steel output in the southwest area from 4% to 12% as a proportion of the entire country's steel production (Zhiyi, 2000). In 2016, the GDP of Panzhihua city was 101.468 billion yuan (approximately US$14.489 billion), an average of 82.2 thousand yuan (approximately US$11,738.16) per head, according to 2016 data published in Panzhihua Statistical Yearbook. Compared with the other cities in Sichuan province, Panzhihua City ranks as first. According to the National Resource-City Sustainable Development Plan (2013-2020) issued by State Council in 2013, there are 262 Resource-based Cities in China. Among them, 10 are located in Sichuan province (General Office of the State Council, 2013). In comparison with the nine other Third-front Resource-based Cities in Sichuan province, the achievements of Panzhihua city are remarkable (see Table 2). According to statistics released by Panzhihua Statistical Bureau in 2017, the GDP of Panzhihua city increased from 0.037 billion yuan (approximately

US$5,283,600) in 1964 to 101.468 billion yuan (approximately US$14.4896 billion) in 2016, a total increase of 2,742.38 times as shown in Figure 2. At the same time, in the construction process of Panzhihua city, the builders overcame many technical problems and successfully carried out a series of innovations, such as high-titanium vanadium titanium magnetite smelting technological innovation, the design of "ivory micro-carving" steel city (Group on "Third Line Construction" and Panzhihua in the Development of the Western Region, 2013).

During the process of its construction Panzhihua city overcame numerous difficulties and its achievements make it stand out from other Third-front Resource-based Cities. However, Panzhihua city remains a typical case among Third-front Resource-based Cities, thus, this case study on the plight of the transformation of a Third-front Resource-based City will be representative of the other Third-front Resource-based Cities and the results in the countermeasures proposed in this study will be relevant and applicable across the board of similar Third-front Resource-based Cities.

The tools used in this study include: (1) personal in-depth interview records; (2) authoritative statistical data obtained from official statistical departments and government websites; and (3) questionnaire survey.

Table 2: Per Capita GDP and Disposable Income of Urban and Rural Residents in Third-front Resource-based Cities (Prefecture-level Cities) of Sichuan Province in 2016

City Name	Per Capita GDP (USD)		Per Capita Disposable Income of Rural Residents (USD)		Per Capita Disposable Income of Urban Residents (USD)	
	Absolute Number	Provincial Ranking	Absolute Number	Provincial Ranking	Absolute Number	Provincial Ranking
Panzhihua	11,741	1	2,007	2	4,691	2
Zigong	6,352	4	1,884	7	4,062	9
Ya'an	5,946	10	1,591	16	3,904	14
Luzhou	4,926	12	1,778	12	4,134	5
Guang'an	4,731	13	1,782	11	4,028	11
Aba Prefecture	4,308	15	1,526	17	4,004	12
Liangshan Prefecture	4,220	16	1,478	18	3,703	19
Dazhou	3,702	17	1,672	14	3,714	17
Nanchong	3,694	18	1,671	15	3,710	18
Guangyuan	3,580	19	1,401	20	3,677	21

Source: Panzhihua City Statistical Yearbook 2017

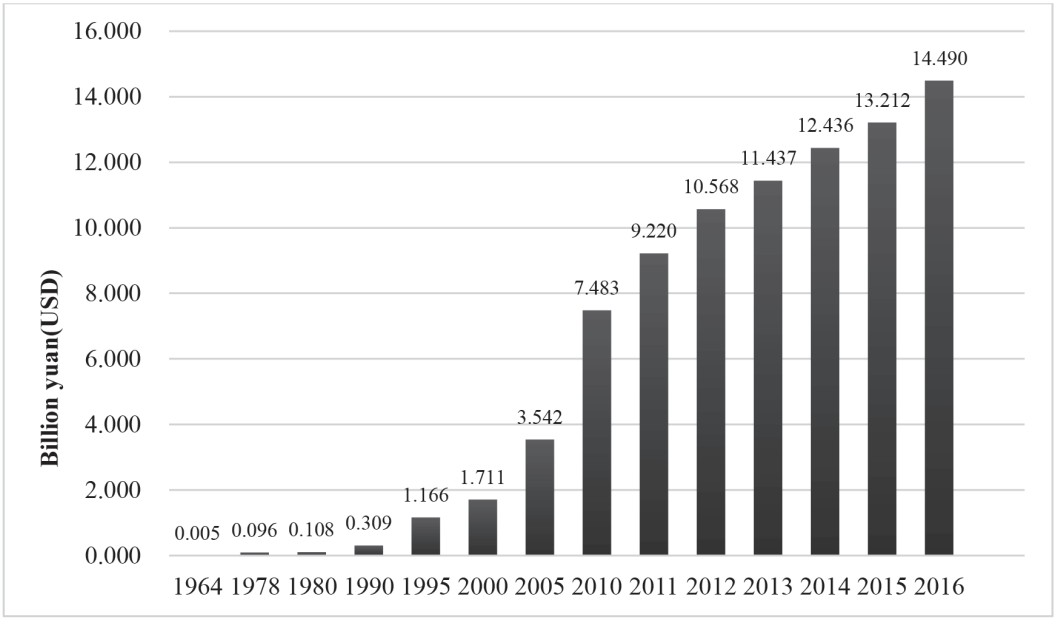

Figure 2: GDP of Panzhihua City in Major Years
Source: Panzhihua City Statistical Yearbook 2017

3.2 Data Sources

The data sources of this study include three parts: data obtained through face-to-face interviews, official government statistics, and data obtained through questionnaires.

(1) Interviewees

In this study, 13 in-depth interviews were conducted according to the needs of the topic choices. The basic personal data of the 13 interviewees are illustrated in Table 3. The interviewees remain anonymous and a digital number instead of real name has been used to protect their privacy. According to the different work unit of the 13 interviewees, they were divided into three groups.

The first group consisted of three on-the-job leaders and employees of Panzhihua Iron and Steel Co., Ltd. (the key project of the Third-front Construction). The purpose of these in-depth interviews is to gain a deeper understanding of the development status and structural problems confronted by the Third-front Enterprises in Panzhihua city in recent years. In this way, the evidence provided could be mutually supportive among the three interviewees, thus ensuring the objectivity and reliability of the interview

content, avoiding interference from personal prejudices, and ensuring the authenticity of the interview content.

The second group included four state officers in Panzhihua city engaged in urban development related to data analysis, business management, city management, and party management. The purpose of these in-depth interviews is to gain a comprehensive understanding of the situation and structural issues confronting Panzhihua city in recent years from different perspectives, as well as to ensure the authenticity and accuracy of the interview results.

The third group has six professionals and technical researchers from Panzhihua university engaged in research in the vanadium and titanium industry, sunshine health industry, and heritage protection of Third-front Construction (two researchers from each area). The purpose of selecting these interviewees was to understand Panzhihua's current situation and difficulties in these three industries. The aim of interviewing two researchers from each area is to gather reliable evidence that is mutually supportive and avoids subjective prejudice.

The researchers recorded and transcribed the interviews. Two researchers were at the each interview, one conducting the interview and the other taking notes. Immediately after the interview, the researchers cross-checked the facts and impressions. The researchers followed Eisenhandt (1989) who stated the detailed interview accounts should be made within 24 hours of the interview, included all data and interview notes with the researchers' overall impressions. In designing the study, the researchers followed Miles and Huberman (1994) by clearly identifying the study intentions and the data collection processes from the interviewees. The researchers avoided "elite bias" by interviewing different levels of staff including professors, managers, directors, and ordinary office clerks. The researchers triangulated the findings over multiple sources and asked colleagues to check the findings and conclusions as the study progressed.

Table 3: Basic Personal Data of Respondents

No.	Group	Gender	Age	Company/ Depatement	Position (Title)	Research Direction
1	1	Male	51	Panzhihua Iron and Steel Company	Deputy Manager	Third Front Enterprise
2	1	Male	50	Panzhihua Iron and Steel Company	Deputy director	Third Front Enterprise
3	1	Male	51	Panzhihua Iron and Steel Company	Clerk	Third Front Enterprise
4	2	Female	49	Government of Panzhihua City	Deputy Director	Analysis of Urban Statistics
5	2	Female	28	Government of Panzhihua City	Office Clerk	Business Management
6	2	Male	35	Government of Panzhihua City	Director	City Management
7	2	Male	50	Government of Panzhihua City	Deputy Director	Party Management
8	3	Male	44	Panzhihua University	Vice Dean (Professor)	Vanadium titanium industry
9	3	Male	43	Panzhihua University	Vice Dean (Professor)	Vanadium titanium industry
10	3	Male	46	Panzhihua University	Director	Sunshine Health Industry
11	3	Female	51	Panzhihua University	Vice Dean (Professor)	Sunshine Health Industry
12	3	Male	30	Panzhihua University	Director	Heritage protection of Third Front Construction
13	3	Male	44	Panzhihua University	Dean (Professor)	Heritage protection of Third Front Construction

To enhance the reliability of the result, the researchers followed Miller, Cardinal, and Glick (1997) and the approach taken by Cardinal, Sitkin, and Long (2004), using free reports and not forced reports, allowing informants to not answer a question if they did not remember clearly. The researchers verified each report by asking the same questions to multiple participants. Finally, the researchers supplemented the interviews for secondary data and supported them via the questionnaire survey, as described below.

(1) Interview questions

For the practitioners involved in Third-front Enterprises, the main problems include three parts: the overall working situation of the company and the largest problem the company is facing now; the company's production situation and awareness of management problems; and the current sales situation of the enterprises' products, including the most significant impact on sales.

For the research of Panzhihua city transformation, the main problems include four parts. Firstly, the statistical data on the past five years show that the city's overall economic status and the transformation problem met with Panzhihua city's development. Secondly, the city's present situation of overall development of vanadium and titanium industry and the problems it faces. Thirdly, the conditions for the city to develop sunshine health industry and the present situation of the city's overall development of this industry and the difficulties it faces. Fourthly, the current situation of cultural heritage protection in Panzhihua's Third-front Construction and the problems in the protection of its cultural heritage.

(2) Official statistics

The data in this study included National Resource-City Sustainable Development Plan 2013-2020 published on the official websites of the State Council, Panzhihua Statistical Yearbook published by Panzhihua Statistical Bureau in 2017

(3) Questionnaire survey

In order to show the reliability and validity of the conclusions drawn from the in-depth interviews and official data, 331 students were randomly selected from the only undergraduate college in Panzhihua city. A questionnaire survey was conducted on their willingness and reasons for choosing to stay in Panzhihua city to find employment.

The result shows the current situation of the city's transformation and development and verify the rationality of the city's transformation and development countermeasures. The specific questionnaire questions are introduced in the data analysis section.

3.3 Data Analysis

(1) Preliminary collation and classification of personal in-depth interview materials

The research follows Eisenhardtand (1989) and Van Maanen (1988). Eisenhardt believed that "research needs to be related to practical experience to develop a set of verifiable, relevant, and effective theories" (Eisenhardt, 1989: 532). Van Maanen believed that such research "should be based on empirical evidence to make sure the credibility and analytics of research, ultimately the interesting research issues (Van Maanen, 1988: 29)." Therefore, this study focuses on the problem based on the data and information collected via interviews. Throughout the analysis process, the researchers repeatedly pondered the relationship between the presentation mode of raw materials and materials, the related transformation theory of Resource-based Cities, and the basic characteristics of Third-front Resource-based Cities. This study used an iterative and not a linear path, but for simplicity, the different stages of the analysis are listed below.

First step. Because the purpose of this study was to develop countermeasures in the transformation of China's Third-front Resource-based Cities, the first step of the analysis was to reveal the difficulties related to the transformation of China's Third-front Resource-based Cities through interviews. Interviews for this study were conducted with 13 participants as shown in Table 4.

Second step. As is well-know, in the root cause of many of challenges, there are a large number of opaque reasons and Third-front Resource-based Cities in the situation of transformation are no exception. During the interviews, the researchers collected the data on the root causes of the structural problems related to transformation as shown in Table 5.

In the process of data acquisition, the researchers recorded the interviews with the consent of the interviewees, and after the interviews were completed the interviewees were invited to read the written records. A confidentiality agreement was also signed, and an agreement about which parts of the content of the interviews could be included was concluded.

(2) Questionnaire survey supports the interview results

The development of a city cannot be separated from the participation of labor. Therefore, the employment intention of the labor force can reflect the development status of a city to a certain extent. Employment intention can indirectly show the development status and the future of the city. Therefore, to the further test of the accuracy of the in-depth interviews and related data published by the government, the researcher used the platform of Tencent Questionnaire, asking students to send in questionnaires using mobile phones "scanning two-dimensional code to answer the questionnaire." A random questionnaire survey was conducted in Panzhihua college on students' employment intention in Panzhihua city. The researcher intended to discover through the students' reasons behind choosing to leave or stay in Panzhihua city. Thus, the researcher can gather the data revealing the transformation issues of Panzhihua city. In this research, 331 questionnaires were collected by anonymous random selection. The specific information reflected on the questionnaire are shown in Figure 3 and Figure 4.

The results of this questionnaire indicate that "traffic inconvenience" and "location disadvantage" reflect the in-depth interview data and are the key factors restricting Panzhihua's successful transformation and development. Furthermore, they are consistent with the data published by Panzhihua authority on the current situation and issues facing the city, indicating that the government data is highly reliable.

Table 4: Key points of interviews on Third-front Resource-based Cities

Category of Urban Transformation Problem	Interview Content
Location traffic status	"Panzhihua Iron and Steel Co., Ltd. is located in the remote western region of China. Because of the high cost of transportation, it has obvious disadvantages of the site." "From the point of view of expressways, comparing with the eastern areas, there is a huge difference. Only one expressway in Panzhihua.....lack of high-speed rail limits the development of Panzhihua city. When people from outside come over to talk about business, they also check the level of development of transportation. It's really inconvenient to enter and exit the place."

Table 4: Key points of interviews on Third-front Resource-based Cities (Cont.)

Category of Urban Transformation Problem	Interview Content
Enterprise management	"In the past, there were too many manager layers and a few contacts between managers and employees which resulted in the alienation of the relationship between managers and employees. The inconsistency of goals between managers and executives, unclear definition of post categories, all these created high management costs and more conflicts."
The introduction of funds	"At present, Panzhihua city has Vanadium and Titanium Industry Development Fund and Health Industry Development Fund, but..... the complex process of bank financing needs to be stipulated..... Therefore, how to obtain more financial support is a difficult problem for the development of these two industries." "In recent years, attracting foreign investment is an important source of funds and coastal areas have great advantages in attracting funds, investment in those areas can be immediate. However, the site like Panzhihua city is very difficult to get investment from foreign countries."
Development of vanadium and titanium industry	"Panzhihua vanadium and titanium technology are still at the middle and low-end level, urgently needs to develop to the high-end. It is mainly manifested in the small-scale, incomplete industrial chain, low quality, and quantity of talents in Panzhihua City. Because there is no regional advantage, serious brain drain in Panzhihua City." "From the quantitative point of view, only a few people engaged in vanadium and titanium research in Panzhihua city and it's far from enough. From the quality point of view, we lack leading figures. Because only a few local people engaged in vanadium and titanium research, it has not formed a team, and the local talents do not have the advantages."

Table 4: Key points of interviews on Third-front Resource-based Cities (Cont.)

Category of Urban Transformation Problem	Interview Content
Development of sunshine health industry	"As for the problems faced by the development of sunshine and health care industry in Panzhihua, the first one is the inconvenient transportation. At present, there is no high-speed railway in Panzhihua city, only trains and expressways. Although there are planes but only a medium-sized airport, so it's very inconvenient to go in and out by plane. For example, it takes nearly 50 hours by train from Beijing to Panzhihua. The second problem is lagging internal infrastructure. At present, the traffic in Panzhihua is quite convenient, but it is not ideal for the outskirts where the road condition is very bad."
The protection and utilization of Third-front Construction Heritage	"At present, the protection for Third-front Cultural Heritage nationwide is just a preliminary start and the work is not very solid, the level of protection is also not complete enough. Secondly, the protection and utilization of Third-front Industrial Heritage in the later period are weak". "What are the Third-front Cultural Heritage? how to protect them? We haven't formed our own thought yet." "There are some difficulties in evaluating the value and potential for the cultural heritage of Third-front Construction in Panzhihua city. For example, how to understand the national defense culture? How to inherit the industry cultural heritage? How to merge the regional culture? How to treat the immigrant culture?"
Market management of enterprise	Panzhihua Iron and Steel Co., Ltd. had a very difficult time from 2013 to 2015, especially in 2014, "The average cost of producing steel per ton is RMB ¥2200 (approximately US$314.16), while the market price of steel per ton is only about RMB ¥1870 (approximately US$267.03) which means that every ton of steel sold will lose about RMB ¥300 (approximately US$42.84) to RMB¥400 yuan (approximately US$57.12). "

Table 5: Classification of Reasons for the Transformation Problem of Third-front Resource-based Cities

Causes of Urban Transformation Problem Category	Interview Content	Analysis of Interview Content
Difficulties caused by location traffic factors.	"As for the problems faced by the development of sunshine and health care industry in Panzhihua, the first one is the inconvenient transportation. At present, there is no high-speed railway in Panzhihua city, only trains and expressways. Although there are planes but only a medium-sized airport, so it's very inconvenient to go in and out by plane. For example, it takes nearly 50 hours from Beijing to Panzhihua. The second problem is lagging internal infrastructure. At present, the traffic in Panzhihua is quite convenient, but it is not ideal for the city. Many places are old roads built many years ago and the road condition is very bad."	This information shows that the location and the inconvenient transportation have been a drag on transformation and development of Panzhihua city.
Difficulties caused by management factors.	"At present, Panzhihua city has Vanadium and Titanium Industry Development Fund and Health Industry Development Fund, but……the complex process of bank financing needs to be stipulated……Therefore, how to obtain more financial support is a difficult problem for the development of these two industries."	This revealed that the bureaucratic management model can no longer adapt to transformation and development of Panzhihua city.

Table 5: Classification of Reasons for the Transformation Problem of Third-front Resource-based Cities (Cont.)

Causes of Urban Transformation Problem Category	Interview Content	Analysis of Interview Content
Predicament caused by institutional factors	"In the past, there were too many managers and a few contacts between managers and employees which resulted in the alienation of the relationship between managers and employees. The inconsistency of goals between managers and executives, unclear definition of post categories, too many assistants posted and space for some people to steal time, high management costs and more conflicts."	The section shows that the problems of overstaffed organization, unclear responsibilities, and powers, inefficiency and waste of resources have obstructed the transformation and development of Panzhihua city.

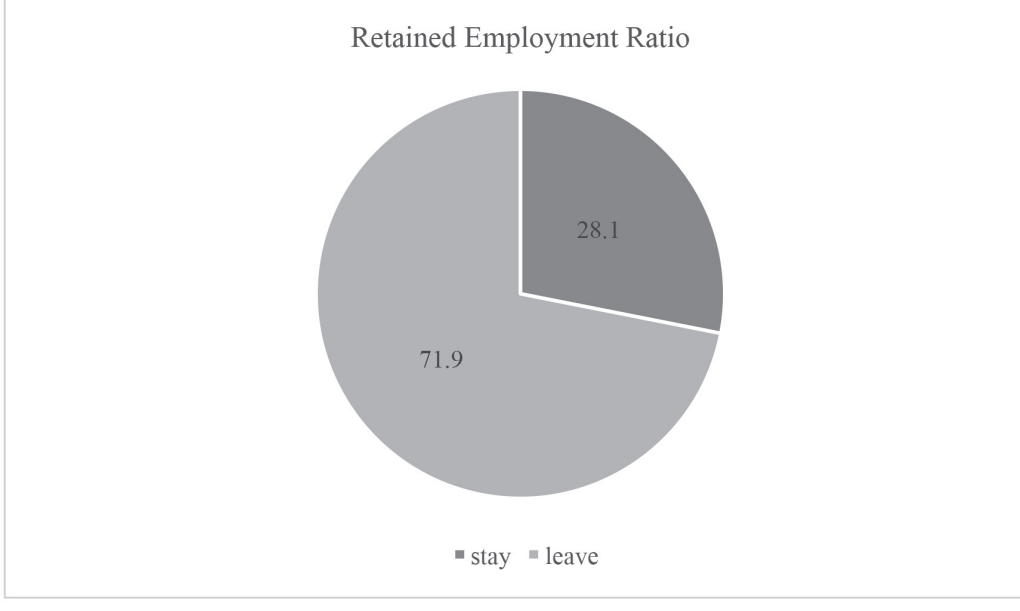

Figure 3: Students' Employment Willingness in Panzhihua College

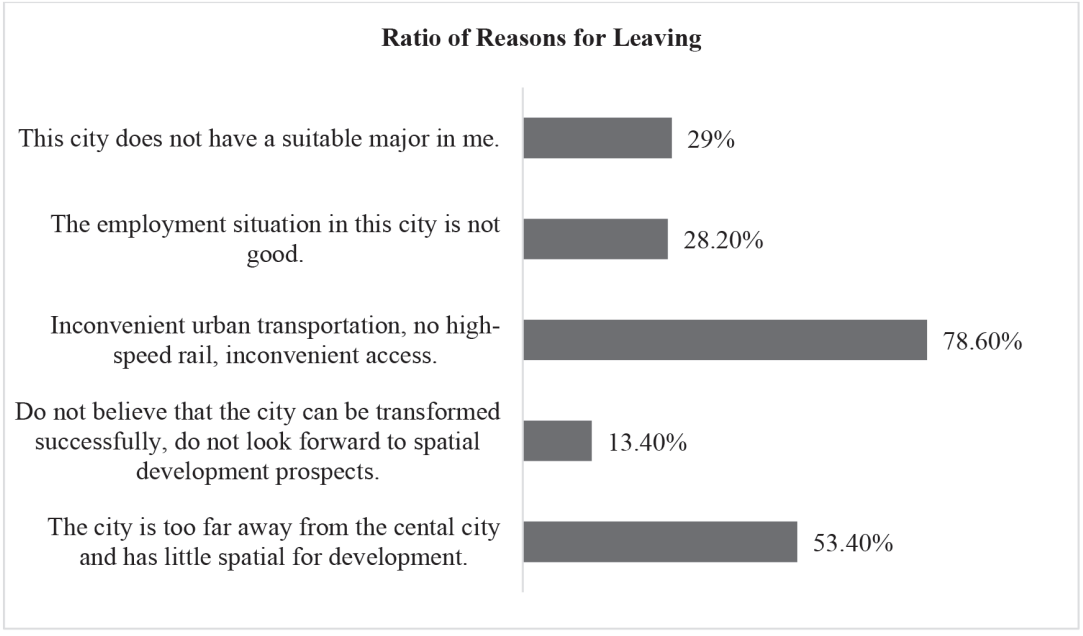

Figure 4: Causes of Students' Employment Intention in Panzhihua College

4. Results of Initial Analysis

From the previous research, it can be concluded that Panzhihua city is facing three difficulties in the process of urban transformation and development.

4.1 Structural Problem I: Location disadvantage caused by layout

During peacetime cities toward the east coast–where the terrain is flat, population plentiful, and transportation infrastructure abundant–have a greater competitive advantage in comparison to cities in the central and western interior–where terrain is steep, population is less dense, and transportation infrastructure is underdeveloped. However, the formation and development of Third-front Resource-based Cities is a result of the positioning mandated by the central government for the purpose of war preparation and following the principle of "relying on mountains, dispersing and concealing." After peaceful development began, the location of Third-front Resource-based Cities made out of the need of war usually falls into the problem of development and transformation due to geographical disadvantage. Therefore, the location disadvantage caused by the layout problem has long troubled the development and transformation of China's Third-front Resource-based Cities in peacetime.

Panzhihua city is exemplifies this structural issue as it is located in the deep mountains, 614 kilometers north of Chengdu city and 273 kilometers south of Kunming city (Panzhihua Statistical Bureau, 2017). There is a large distance between Panzhihua city and the capital city of Beijing. In today's era of globalization with the theme of "peace and development" and information characterized by the rapid transit of information and logistics, the distance barrier has become a major obstacle to "capital investment" and "talent introduction," two "natural barriers" to the development of modern industries.

Because of the location disadvantage, the traffic problem has become a key issue to resolve through better urban planning in order to foster urban transformation and development. However, the current traffic situation in Panzhihua city is very unsatisfactory, as one interviewee pointed out: "From the point of view of expressways, comparing to the eastern areas, we could see the great differences. There is only one expressway in Panzhihua and only three high-speed railways in Sichuan Province. As the southernmost city in Sichuan, Panzhihua has no high-speed rail in the 12th Five-year Plan and 13th Five-year Plan. Obviously, Panzhihua city has been excluded from the high-speed rail industry. As we all know that where the high-speed rail extends, the district of economy develops, the lack of high-speed rail, the development of that area will be limited. When people from outside come over to talk about business, they also check out the level of development of transportation. As the matter of fact, it's very inconvenient for people and goods to enter and exit Panzhihua city."

Meanwhile, according to the results of the questionnaire, 71.9% of the 331 students who participated chose not to stay in Panzhihua city for future employment. When asked about the reasons for not choosing to stay, 78.6% chose "urban traffic is not improved, there is no high-speed rail, inconvenient access" as the top reason. Meanwhile, 53.4% chose "the city is too far away from the central city, and there is little spatial for development." This result shows that the disadvantage of the location and the traffic situation have seriously hindered the economic and social development of Panzhihua city and is the key factor restricting its transformation and development.

4.2 Structural Problem II: Operating disadvantage caused by management

In this era of market economics, the market should be the primary target of concern for business operators. Enterprises should respond to changes in the market, and

management of a company should regulate the organization accordingly. However, many businesses are a third-tier companies born under the planned economy system and due to the long-term impact of the traditional thinking mode of the planned economy, the important role of the market is often ignored. At the same time, the government's macro management and policy supervision of corporate operations also play a very important role in the smooth operations of enterprises. Panzhihua Iron and Steel Company, for example, a Third-front company in Panzhihua city, has a backward management style with a lack of market awareness. This antiquated approach to of management has serious consequences, for example, during the period 2013 to 2015, it was in serious trouble due to major overcapacity in China's steel market and a management that was unable to adjust to the market situation.

Three employees who have worked in Panzhihua Iron and Steel for more than 20 years during the interviews all discussed the latest business problem from 2013 to 2015. "The most difficult time of Panzhihua Iron and Steel Company was about 2013, 2014 and 2015, especially in 2014. The average cost of producing steel per ton was about RMB ¥2200 (approximately US$314.16), while the market selling price of steel per ton was only about RMB ¥1870 (approximately US$267.03) which means that every ton of steel sold lost about RMB ¥300 (approximately US$42.84) to RMB ¥400 yuan (approximately US$57.12)."

When talking about how Panzhihua Iron and Steel resolved this predicament, the respondents thought that "the main reason for Panzhihua Iron and Steel to get out of this predicament was the national policy: first, the state issued policies to subjectively regulate iron and steel production and seriously restrict the problem of excess production capacity. For example, the relevant management departments of the national government have restricted the output of the two largest iron and steel production areas in China, Hebei Iron and Steel Production Area and Shandong Iron and Steel Production Area which has reduced the market output, thus reducing the overall output and alleviating the oversupply in the past. Second, the government strictly prohibits the production of "Inferior Steel." Inferior Steel refers to steel made from ordinary scrap steel or steel slag after simple processing, producing a kind of bar steel normally of poor quality. If using this kind of steel to build a house or a bridge, it will be very dangerous and easily collapse. In Panzhihua city alone, the government has knocked out 50 to 60

Inferior Steel manufacturers. Thirdly, to cope with the problem of excess iron and steel production capacity, the state has issued policies to promote the reduction of steel prices which have promoted a large-scale shuffling of the steel industry, leading to the closure of some enterprises with improper operating conditions. In this round of shuffling, some excellent private enterprises took the lead in getting out of the predicament, and then some state-owned enterprises with huge potential gradually got out of the predicament."

It is not difficult to see from this statement that the main reasons that led to Panzhihua Iron and Steel's current economic difficulties are twofold. First, the government has neglected market management. For example, due to inadequate market supervision, substandard products flooded the market. The situation has also been exacerbated by the overcapacity of the steel industry. Second, the company itself does not pay enough attention to the market, which results in a slow response to changes in the market, which ultimately causes the company to suffer serious operating problems.

Under the traditional planned economic system, the government's role is to make decisions and give instructions, like a lofty, indifferent, and dignified parent. However, in the context of market economy, the government should change its concept, have a strong sense of service, pay close attention to market changes at all times, strive to create a suitable competitive environment for enterprises, maintain normal competition, and crack down on illegal enterprises so that enterprises who abide by the law and have excellent quality can gain a favorable competitive position.

To sum up, the failure of government to fulfill its duty in terms of management leads to disorder and confusion in market competition, leading to "bad currency expelling good currency," generating market problems, and eventually hindering the development of urban transformation.

4.3 Structural Problem III: Market disadvantage caused by institution

The primary purpose of enterprise is to generate a profit. However, this was not case in the construction of Third-front Enterprises, which were constructed for national defense. In 1964, China was confronted with war threats from the four directions: from the east (thread of American military exercises), the south (American Vietnam War),

the west (the Sino-Indian War) and the north (the Soviet nuclear threat), placing mainland China under tremendous national defense pressure (Donglin, 2003: 77-102). All the material and human resources of these enterprises are under the unified control of the national plan. The products of the enterprises are allocated by the central government. Panzhihua Iron and Steel, as the key project of the Third-front Construction, is a state-owned enterprise under the direct leadership of the Central Metallurgical Ministry. Thus, its management need not concern themselves with market problems if they can regularly and quantitatively fulfil the state's mandatory plans. Under this mode of management, numerous managerial problems can arise, such as unclear responsibilities and powers, many management levels, overstaffed organizations, high administrative costs, low production efficiency, low motivation for technological innovation, lack of competitive vitality of enterprises, imbalance between wages, and expenditures of labor force.

After the reform and the opening up of the country in 1978, although state-owned enterprises have gained a certain level of autonomy, the original management structure has remained with its ambiguous allocation of responsibilities and powers. A series of problems still exist such as many levels of management, overstaffed institutions, high administrative costs, low production efficiency, low motivation for technological innovation, lack of competitiveness, and the disproportionate income and expenditure of labor force. These problems make it difficult for many state-owned enterprises to compete with market-oriented private enterprises with clear responsibilities, clear goals, flexibility, and pragmatism. However, local governments share similar features thus also faces the problems of overstaffing, high administrative costs, low administrative efficiency, prevailing bureaucratic style, incompatible income, and labor. The rigid and backward system means it is difficult to adapt the market economic model which prioritizes profit, efficiency, flexibility, and responsive to changeable market conditions. This is a main reason for Third-front Resource-based Cities failing during the period of transformation.

The interviewees describe the management of these enterprises thusly: "As an old central enterprise, there are still some problems in management. We reformed three years ago due to the impact of the market. In order to deal with the predicament, save energy, increase efficiency, the reform has completed and achieved a great result, but it still has some problems," said one interviewee. "In the past, there were too many

managers but now only a few are left. Managers and employees have more opportunities to contact each other and have more harmonious relationships. The number of managers is small but very capable. Almost every manager does several things at once," said another interviewee.

At present, the uppermost level of management has less contradictions because it has common goals. In comparison to the past, the specific work and responsibility of each member is clearer with reduced overlap, and management has become more professional. An interviewee said, "Since the people reformed three years ago, it has a big positive impact on production performance. Employees have become willing to work hard because it is directly linked to their income which means more work will earn more income, so the employees put great effort into their work."

The interviewees employed at Panzhihua Iron and Steel mentioned that the reform of three years ago was a pivotal moment. The result was positive for the company with the management model recreated from the traditional state-owned model with its rigid backwardness to free market model. Overall, the reform has led to the improvement of the enterprises in general, with a great difference in the "spirit" of the enterprises after the reform.

Meanwhile, the management advantages of Third-front Resource-based Cities at the local government level? An interviewee pointed out that in order to encourage the development of vanadium and titanium industry and sunshine health industry in Panzhihua city, a special vanadium and titanium industry development fund and sunshine health industry development fund were established. One interviewee said, "The current problem is how to make these industries more supportive. Despite the existence of these two kinds of funds, there are many regulations and boundaries between them. It is unlikely that they can be taken out directly from the mouth of finance and complex processes such as bank financing that need to be regulated and involved. The financial side is 'more monks and less porridge,' so how to get more financial support is a difficult problem for the development of these two industries." This interview shows that problems remain in the management of Third-front Resource-based Cities, such as cumbersome administrative procedures, inefficiency, and many policies that are difficult to carry out remain in place. In conclusion, overstaffed organization, ambiguous

responsibilities and powers, and inefficient management system are the main barriers to the successful transformation and development of China's Third-front Resource-based Cities.

5. Discussion

In the past, international research on the transformation problem of Resource-based Cities usually included: (1) Resource Locking Trap; (2) Professional Lock-in Trap; (3) Government Subsidy Trap; and (4) Waste Ghost Towns (Li, Chunmei, & Zuo, 2008: 15-22). However, the transformation problems of China's Third-front Resource-based Cities discussed in this study are different to general Resource-based Cities due to a series of special historical and political reasons: (1) Layout; (2) Management; (3) Institutional.

On the surface, firstly, there were differences in the purpose of the Third-front Resource-based Cities and the general Resource-based Cities at the beginning of construction. The former were established out of political considerations and the latter out of economic considerations. Secondly, there are great differences in the operational models of the Third-front Resource-based Cities and the general Resource-based Cities. The former belongs to the planned model of government-enterprise integration, while the latter belongs to the market-oriented model. Third, the problems faced by the Third-front Resource-based Cities is different from the problems faced by the general Resource-based Cities in the process of transformation. The reason for the former's difficulties is often closely related to the "weaning" off from government, while the latter is typically related to resource depletion, overcapacity, lagging capacity, and other market factors.

However, when investigating the factors underpinning these problems, the researchers found that the root causes of China's Third-front Resource-based Cities problems lie in the conflicts between the three major concepts in the process of transformation, namely, the conflict between war and peace, the conflict between ownership and private ownership, and conflict between planned economy and market economy as shown in Figure 5.

5.1 Conflict between the Idea of War and Peace

The locating of an enterprise based on the concept of "war readiness" is entirely different from that based on "peace." The locating of an enterprise based on the concept of "preparedness" usually takes the "security factor" as the primary consideration to prevent enemy bombing or destruction. Therefore, in preparing for the war, the locating of China's Third-front Construction Projects will inevitably follow the principle of "relying on mountains, dispersing, and concealing." During periods of peace, the locating of an enterprise usually is based on the location of raw material, markets and urban centers with convenient transportation to maximize the economic advantage of the enterprise. However, for China's Third-front Enterprises, when the overall international situation changed, the once imminent threat of the war has receded, and "peace and development" have become the theme of the times.

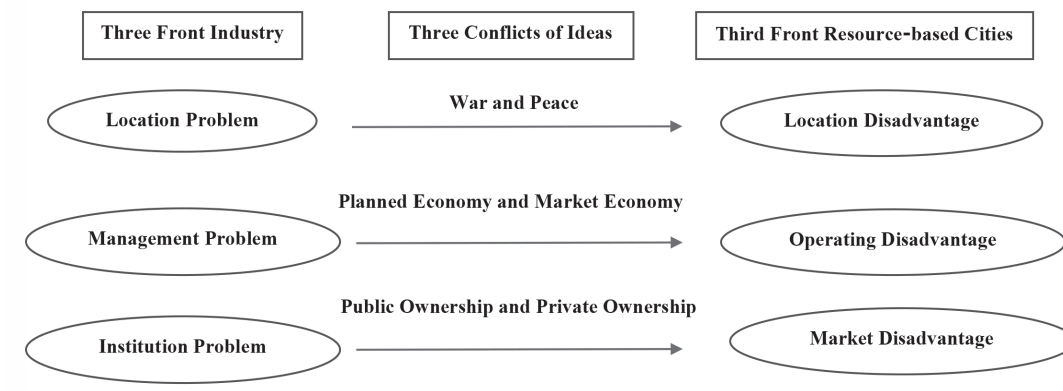

Figure 5: Structural Problems of Industrial Transition in the Third-front Resource-based Cities
Source: Developed by the author

In this new era, Third-front Enterprises find it very difficult to transform themselves because of the original location choices. The principle of "relying on mountains, dispersing, and concealing" resulted in a massive waste of people and material resources. Being far from urban centers also makes it difficult for enterprises to attract investment and talent. Although the government has relocated thousands of these enterprises since the 1980s, many remain deep in the mountains, such as in the case of Panzhihua Iron and Steel. Panzhihua city, established by Panzhihua Iron and Steel, relies on the project and is bound to suffer from the choice of location. Therefore, the conflict between the concept of war

and the concept of peace is the root cause of the barrier to the transformation of Third-front Resource-based Cities.

5.2 Conflict between Planned Economy and Market Economy

Planned economy and market economy are two different forms of social and economic management. It was once believed that a planned economy was the product of public ownership while a market economy was the product of private ownership. However, since rise to Keynesian economics, the difference between them has been blurred. Deng Xiaoping's vision for China has put forward the concept of a market economy under socialist public ownership. However, since the management model of the planned economy was retained, there has been major difficulties in adapting. From raw material supply to organizational production, to product sales, almost all links revolve around the market economic model. The development of a city is often closely related to the overall situation of the enterprises under its jurisdiction. In the context of the market economy, in order to adapt, enterprises should adopt a market-centric business philosophy, actively promote the development of the enterprise, and strive to develop in line with market changes. However, in reality, a certain number of state-owned enterprises retain the management model of the planned economy, ignoring the importance of market factors, leading to a disconnection between the production of the enterprise and the market, and ultimately putting the enterprise in jeopardy. For Panzhihua city, where Panzhihua Iron and Steel is a major enterprise, the choice of a market or planned economic management model will directly determine the operating status of Panzhihua Iron and Steel, and will affect the future city of its success or failure in transformation and development.

If the overall business situation of the enterprise is negative, it will inevitably result in a huge negative impact on the development of the city. As for Panzhihua Iron and Steel, its operation will directly affect the future urban transformation and development of Panzhihua city. Therefore, the conflict between the concept of planned economy and the concept of the market economy is a fundamental reason leading to the management problem and operating disadvantage of Third-front Resource-based Cities.

5.3 Conflict between the Idea of Public Ownership and Private Ownership

Public ownership and private ownership originally belong to two opposite political concepts. In China, public enterprises are also called state-owned enterprises, meaning the state is in charge of management, and output belongs to the state. Unlike state-owned enterprises, the ownership and management of the private enterprises is in the hands of private ownership and output belongs to private owners. During the era of the planned economy, management of Third-front Enterprises were not autonomous. What and how much to produce depended on the national government. This operational model inevitably led to a lack of ability of its leaders to work independently.

When the external situation changed, the state returned autonomy to the management of the enterprises, however, the majority of the leaders were unable to cope, leading to inertia. It has been four decades since the opening up of China and two decades since the state gave managerial autonomy to the Third-front State-owned Enterprises, but the concept of traditional management under public ownership still exists. In fact, in the transition process of third-tier resource-based cities, more vibrant private enterprises have played an important role in the process of urban transformation. However, the actual situation is that private enterprises find it difficult to obtain equal opportunities for competition with state-owned enterprises, and remain at a relative disadvantage.

In Panzhihua city, due to the country's financial and tax preferences, state-owned Panzhihua Iron and Steel remains the city's largest enterprise. Its operating status still fundamentally determines the fate of the entire city's prosperity or otherwise. Meanwhile, in their competition with state-owned enterprises, private enterprises in Panzhihua city are at a disadvantage in terms of national finance and taxation, and have weak influence on the city. Therefore, the conflict between the concept of public ownership and private ownership is a fundamental reason for the systemic problem and institutional disadvantage of Third-front Resource-based Cities.

6. Conclusion

In summary, the researcher believes that the difficulties experienced in the transformation and development of these Third-front Resource-based Cities are on

the surface caused by huge market fluctuations. However, market fluctuations are in fact only external factors that stimulate the outbreak of the problems, and market fluctuations is not the fundamental factor causing the transformation problems of the Third-front Resource-based Cities. Because of the fierce conflict of the three concepts of war and peace, planned economy and market economy, public ownership and private ownership, the development of the Third-front Resource-based Cities in the transitional stage has had enormous troubles which reside in their planning and construction stage in the middle of last century as the Third-front Construction Projects and the concomitant Third-front Resource-based Cities were not established for profit in a free market economy, but for the reason of national defense. Therefore – whether due to the location disadvantage, the management disadvantage or the institutional disadvantage – the transformation challenges are congenital and endogenous, not the result of external factors encountered during development. However, despite the innate and endogenous nature of the difficulties facing them, Third-front Construction Projects and Third-front Resource-based Cities have substantially improved China's industrial situation and strengthened its national defense.

It has been four decade since the beginning of the period of reform and opening-up, and two decades since state-owned enterprises have gained operational autonomy. In these 20 years, state-owned enterprises in the Third-front Resource-based Cities have had to reduce the burden of "enterprises running social problems." In the planned economy, state-owned enterprises oversaw all facets of employees' lives including children's education and employment, health care, pension, housing distribution, and so forth. Moreover, the personnel organization establishment, the employment system, and working concept management model of the planned economy already become stagnated. Thus, Third-front State-owned Enterprises faced serious issues in the period of transformation. At the same time, the government of Third-front Resource-based Cities also faced a series of challenges in their transition from a bureaucratic "command" government to a market "service" government. To promote the successful transformation of these Third-front Resource-based Cities, all the above "pain" and "challenge" must be experienced. To adapt to the tide of the market economy, they must start from the perspective of location, managerial role, and government system to successfully carry out the transformation.

The researcher believes that the shortcomings of this study mainly lie in two aspects. As is typical of case studies, an important question is whether its findings can be extending to a broader context. Furthermore, even though the samples selected in this study are typical, different cities may have their own priorities. Therefore, future researchers can focus on other Third-front Resource-based Cities to compensate for this limitation.

The most obvious beneficiaries of this study, as a paper focusing on the transformation problem of China's Third-front Resource-based Cities, should be China's Third-front Resource-based Cities in the process of transformation, especially Panzhihua city which was the city chosen in this case study. This study is based on empirical interviews and questionnaires, supported by government data. Thus, the results can be used as a resource by policy-makers of Third-front Resource-based Cities in China, especially Panzhihua city.

In the past, both outside and inside China, the research on the transformation of Resource-based Cities have focused on the structural problem and countermeasures of urban transformation from the perspective of the market economy. Few scholars have considered the market competition disadvantage of China's Third-front Resource-based Cities from the historical and political perspectives. Therefore, it is difficult to make a comprehensive and thorough analysis of the structural problems of Third-front Resource-based Cities in the process of transformation. On this premise, it is also difficult suggest effective countermeasures. However, this study hopes to offer a new way of thinking for researchers engaged in the transformation of China's Third-front Resource-based Cities.

In sum, this study of Third-front Resource-based Cities covering the background of international and domestic politics reveals the obstacles to and root causes of their transformation difficulties. It is hoped this study lays the foundation for the government and future researchers to complete systematic, practical, and possible countermeasures to the structural problems found in this study. As Third-front Resource-based Cities each have their own unique weaknesses and advantages, future researchers could select different cities as case studies to investigate their successful and failed urban transformation strategies and thus contribute to a broad corpus that can contribute to the future transformation of Third-front Resource-based Cities.

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Structural Patronage in Thailand: A Decade of Power Struggle and Problematic Issues in Governance with Regards to The Thai Local Administrative Organizations[1]

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Abstract

This paper examines and analyses contemporary problems of power struggle and problematic issues in governance regarding local administrative organizations in Thailand. The study showed that Thai local administrative organizations, although applying a decentralization principle for decades, still encounter a power struggle in general and problematic issues in governance in four

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dimensions. These are: the structural problem of local administrative organizations, power, and public duties in providing public services, local personnel administration, and local public finance. Based on our findings, we argue that structural patronage has, relatively to other factors, caused most of those problems.

Keywords: Local Administrative Organization, Local Ggovernance, Law and Public Administration, Supervision of Local Administration, Decentralization

โครงสร้างอุปถัมภ์ในประเทศไทย: ทศวรรษแห่งการต่อสู้เรื่องอำนาจหน้าที่และปัญหาในการกำกับดูแลองค์กรปกครองส่วนท้องถิ่นไทย[1]

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บทคัดย่อ

บทความนี้เป็นการศึกษาและวิเคราะห์ปัญหาเกี่ยวกับการอำนาจหน้าที่และการกำกับดูแลองค์กรปกครองส่วนท้องถิ่นของไทย จากการศึกษา พบว่า แม้ว่าจะมีการกระจายอำนาจไปยังองค์กรปกครองส่วนท้องถิ่นมานานหลายทศวรรษ แต่ยังคงมีปัญหาอำนาจหน้าที่ขององค์กรปกครองส่วนท้องถิ่นและปัญหาในการกำกับดูแลที่สำคัญใน 4 มิติ ได้แก่ ปัญหาเชิงโครงสร้างขององค์กรปกครองส่วนท้องถิ่น อำนาจหน้าที่ของท้องถิ่นในการจัดทำบริการสาธารณะ การบริหารงานบุคคลของท้องถิ่น และการคลังท้องถิ่น ผลจากการศึกษาในการศึกษาวิจัยนี้ พบว่า ปัญหาทั้งสี่ประการนี้เกิดจากโครงสร้างและปัจจัยอื่น ๆ ซึ่งนำมาซึ่งปัญหาดังกล่าว

คำสำคัญ: องค์กรปกครองส่วนท้องถิ่น การปกครองท้องถิ่น กฎหมายและการบริหารรัฐกิจ การกำกับดูแลองค์กรปกครองส่วนท้องถิ่น การกระจายอำนาจ

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[1] บทความวิจัยนี้เป็นส่วนหนึ่งของโครงการวิจัย เรื่อง “บทบาทและอำนาจหน้าที่ขององค์กรปกครองส่วนท้องถิ่นในทศวรรษหน้ากับความเปลี่ยนแปลงของสังคม เศรษฐกิจ และการเมือง” ได้รับทุนเมธีวิจัยอาวุโส สำนักงานกองทุนสนับสนุนการวิจัย (ศาสตราจารย์ ดร.บรรเจิด สิงคะเนติ)

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The Nature of Problematic Issues Concerning Local Administrative Organizations.

The 4 dimensions of the problems that local administrative organizations face all relate to their roles, powers, and duties. Each of these dimensions can be described as follows.

First Dimension: The Structure of the Local Administration Organizations

Problematic issues with regard to the structure of local administrative organizations consist of these key issues: problems defining overlapping areas within the regional administration, problems concerning the unsuitability of various structures of local public organizations, and administrative issues within a given local administrative organization.

Currently, Thai local administrative organizations have defined areas that overlap with those of regional administrations. That is to say, the provincial administration comprises administrative organizations in the form of the province, district, sub-district, and villages. Meanwhile, there is also a provincial administrative structure, municipalities in the forms of cities, town municipalities, sub-district municipalities, and sub-district administrative organizations, whose powers and duties have been defined identically to those of the regional government, affecting the effective use of public administration resources and the management of the state's budget. In addition, it was discovered that there are public administration problems due to a lack of efficient regional cooperation with the central government and cooperation between individual local administrative organizations.

To address such issues, it has been suggested that local administrative organizations develop mechanisms to facilitate collaboration between the central government, the regional government, and the local government and that these mechanisms clearly define the responsibilities of each party to cost-effectively utilize their resources. This can be accomplished by utilizing the province or provincial cluster's developmental plans for the related administrative bodies-i.e., the central government, regional governments, and local governments-as well as for the other parties involved. Moreover, it has been suggested that there should be a collaborative agreement in work implementation, contractual planning, and collaborative projects and that all parties'

designate indicators to help them monitor and evaluate their operations. In its initial phase, the Royal Decree on the Integrated Provincial and Provincial-Cluster Administrative Act B.E. 2551 (2008) should be revised to provide for integrated cooperation between all sectors in public administration and improve the laws on the sharing of power and authority for greater clarity (The National Reform Council, Report, 2015: 17). Additionally, a Royal Decree on cooperation between the central government, the regional governments, and the local governments should be drafted and assigned to the Office of the Public Sector Development Commission (Ibid., 18).

Second Dimension: Power and Duties of the Local Administrative Organizations in Providing Public Service

There are two important problematic issues that must also be addressed, as follows:

Firstly, Problematic issues concerning the transfer of the duties and missions to the local administrative organizations. Based on the literature review and interviews with experts, the problematic state can be summarized into three categories according to their causes:

(1) Structural issues regarding organizational decentralization and governmental policy (and national politics). It could be stated that the problems under this category are "the source" of problematic issues regarding decentralization and other Thai local administrative issues, besides issues concerning power, duties, and public services. Issues in this category include issues related to government policies that cease to expedite the complete transfer of missions and duties to local administrative organizations according to the decentralization plan. In other words, the enactment of laws has not been expedited clearly enough to define the mission and responsibilities shared between the central ministries, departments and governmental agencies on the one hand, and the regional administration and the local administrative organizations on the other. Furthermore, there have been no laws to modify the responsibilities of the governmental agencies that carried out such responsibilities previously, resulting in the "transferring of personnel without the transfer of finance." In other words, there was a transfer of mission and responsibilities because of the decentralization law and legislative plan, but funds and personnel from the central and provincial governments have not been transferred to local administrative organizations.

(2) Problematic issues arising from the government agency commissioned with the mission. This problem reflects the insincerity of the central government in the transfer of responsibilities, which includes a lack of commitment to the transfer of its mission to meet the administrative action plans by several government agencies that have ceased to implement the processes and procedures set forth in the decentralization plan to devolve power. The distribution of up to 35 percent of state revenue to local administrative organizations, previously planned, has not been realized. Currently, the central government's revenue distribution to local administrative organizations comprises only 25 percent of its total revenue. Moreover, there are issues resulting from methodological failures in decentralization-namely, most missions and responsibilities have been transferred to the lowest level of the local administrative organizations, which are municipalities and sub-district administrative organizations; on the other hand, over 70 percent of municipalities and sub-district administrative organizations are small and limited in capacity and, therefore, are unable to fulfill the mission and responsibilities that have devolved to other governmental agencies.

(3) Problematic issues arising from local administrative organizations, such as the fact that many local administrative organizations lack sufficient funds and are incapable of collecting sufficient revenues to carry out the mission and responsibilities that have devolved to them. The failure to transfer personnel from other government agencies to local administrative organizations has resulted in the lack of personnel required for the local administrative organization to perform the assigned tasks. This is especially true of tasks for which personnel with specialized expertise are required.

Secondly, Problematic issues in the division of power and duties in the provision of public services between the State and local administrative organizations under the Determining Plans and Process of Decentralization Act B.E. 2542 (1999). This study has found that the Determining Plans and Process of Decentralization Act B.E. 2542 (1999) has failed in its statutory requirements in clearly defining the divisions of powers and duties in the provision of public services between the State and the local administrative organizations, and between local administrative organizations themselves, for the following reasons:

(1) There is ambiguity with regard to interpretations of the legal content of the 37 provisions contained in the Determining Plans and Process of Decentralization Act B.E. 2542 (1999), none of which demonstrate any clear divisions with regard to the scope of authority and duties in the provision of public services between the State government and the local administrative organizations.

(2) Ambiguity concerning the regulations involved in the transfer of tasks and duties and the criteria for the determination of further decentralization: No information stipulating the regulations and criteria that the Decentralization Board requires for consideration in the decentralization of the local administrative organizations can be found. Also, no regulations can be found with regard to further decentralizing local administrative organizations.

(3) Issues concerning overlapping powers and responsibilities between the state government and the local administrative organizations and between local administrative organizations themselves. When the Determining Plans and Process of Decentralization Act B.E. 2542 (1999) was enacted, the provincial administrative organizations, the municipalities, the sub-district administrative organizations, Bangkok Metropolitan, and Pattaya all had additional powers and duties in the provision of public services beyond what was stipulated in the laws concerning their category as local administrative organizations. However, this Act has not been able to clearly determine and define the scope of public service administration between the State government and the local administrative organizations or between local administrative organizations themselves, resulting in a redundancy of authority and responsibilities between the three administrative categories.

The Determining Plans and Process of Decentralization Act B.E. 2542 (1999) has specified that the Provincial Administrative Organizations are responsible for broad-scale public services requiring advanced technical knowledge or for activities that benefit the public at large. However, the provisions, as stipulated in the law as well as in the rulings of the provincial governors and the Supreme Administrative Court and the governor, have still failed to clearly identify or standardize that types of operations or missions that qualify the Provincial Administrative Organizations to administer public services in other local administrative organizations or that qualify them to provide financial support to organizations or agencies.

Third Dimension: Problems of Local Personnel Administration

According to the findings of this study, the current Thai local personnel administration system is unable to attract adequate people to work, and moreover, deters professional progress. In other words, the local personnel administration process fails to draw capable individuals with adequate knowledge and expertise to work with the local administrative organizations due to the fact that the processes involved are numerous, complex, and chaotic, causing delays in the recruitment process, testing, registration, appointment, and transfer of funds; further, salaries are not perceived as attractive, and these administrators are regarded as second-class public officers. All these factors result in local administrations' failure to recruit talented and able individuals to work for their localities (Kokphol O. and Chaowna S, 2007: 22)

With respect to the obstruction of professional progress, it has been discovered that qualifications for certain positions-such as the deputy chief of a local administrative organization-requires that one obtain an educational degree only in political science or law, prohibiting other types of professionals from applying and, thus, barring knowledgeable, capable or skillful individuals from other professional fields from securing the position. Moreover, it has been discovered that there are no systems in place to promote capable personnel to the regional or central administration, nor do they have any opportunity to become high-level executives in the position of director-general of the Local Administrative Organizations, despite being well informed and knowledgeable in local administration (Ibid, 23).

Moreover, issues related to the central organization include issues of personnel administrative organizations lacking unity as a result of the personnel administrative structure implementing a three-level committee according to the Local Personnel Administration Act 2542 (1999), which consists of the Office of the Commission on Local Government Personnel Standards, the Central Board, and the Provincial Board. The Provincial Board divides their committees further into the PAO committee, the municipal committees, and the TAO committees. The practical implications of this division are redundancy and the overlap of power and responsibilities, a lack of clarity, and confusion within the local administrative organization. These factors result in varying advantages and disadvantages between the various types of government officials and employees. Furthermore, they complicate and delay the transfer of local employees (Ibid.).

Additionally, there are issues arising from the composition of the Office of the Commission on Local Government Personnel Standards. Namely, there is a requirement that representatives from local administrative organizations be members of the Office of the Commission on Local Government Personnel Standards, but, in practice, it has been discovered, local officers who have been affected by the promulgated resolutions or regulations directly have not been represented on the committee (Apichart Statidniramai:, 2012: 79-80) In addition, the senior members comprising the committee are predominantly retired officials who lack knowledge and understanding about local government organizations and personnel management (Ibid, 24).

Since personnel management is not independent of the Office of the Commission on Local Government Personnel Standards, local governments may be dominated by a central authority. The lack of any real independence in the administration of their work is a result of the structure stipulated for the Office of the Commission on Local Government Personnel Standards, under the Ministry of the Interior, which has a Permanent Secretary of the Ministry of the Interior with the Director-General of Local Administration as commission members and the Head of the Commission as the secretary. Consequently, the Commission is administered by people who come from the Ministry of Interior. This is the cause of local government lacking any real independence in their management of personnel (Ibid).

Fourth Dimension: Problems of Local Finance

Major problems regarding local finance include issues concerning local administrative organizations' revenue structures, laws and regulations, fiscal development capacities, and budget allocations regarding intergovernmental transfers to local administrative organizations. Issues concerning local administrative organizations' revenue structures are significant problems for local fiscal systems due to the following:

(1) The proportion of revenue allocated to the local administrative organizations, which is determined to be 35 percent of net governmental revenues, has not been achieved (Office of the Decentralization to the Local Government Organization Committee, 2017).

(2) Local administrative organizations rely on intergovernmental transfers as their main sources of revenue. Although the proportion of the revenue of local administrative organizations to net governmental revenue has increased annually, this increase is due to subsidies. Local administrative organizations have relied on subsidies as the major source of revenue since 2001.

(3) Imbalances in intergovernmental transfer revenues between general subsidies and specific subsidies persist even though the government has allocated greater amounts of intergovernmental transfers. The increase has been in terms of the proportion applied to that of specific subsidies, though, during this current government administration (of General Prayuth Janocha), the amount has decreased (Office of the Decentralization to the Local Government Organization Committee, 2017).

(4) Thai intergovernmental transfers have fiscal restrictions since most subsidies come with conditions for their use. Thus, subsidies can be divided into specific grants and general grants. The specific subsidies are funds allocated by the government for the implementation of certain governmental objectives or for the implementation of certain governmental policies, whereas the general subsidies are divided into two categories: general subsidies for specified missions or objectives and general subsidies according to their powers and duties. Therefore, local administrative organizations lack the freedom to apply either general or specific subsidies. In the calculation of intergovernmental transfers, it was discovered that conditional subsidies accounted for 70 percent of all intergovernmental-transfer revenues (Department of Local Administration, 2017).

(5) Another major source of revenue for local administrative organizations are revenues from the State. This includes all the taxes that the State has collected and allocated on its behalf. The local administrative organizations' tax revenues collected by the government are estimated at 30 percent, and 20 percent of these revenues are dependent on governmental allocations. For the above reason, the local administrative organizations are dependent upon the State government for approximately 50 percent of its entire revenue, which affects local administrative organizations' fiscal autonomy. Only 10 percent local administrative organizations' total revenues come from their own tax collection.

(6) Lastly, the problem of overlapping revenue structures between local administrative organizations themselves and the fact that local administrative organizations' revenue structures do not currently consider socio-economic differences leads to different public service needs. However, these types of revenue structures do not differ.

Key problematic issues pertaining to expenditures and the budgeting of local administrative organizations are as follows:

(1) Public participation in budgeting is considered necessary, as it greatly increases the expression of public opinion in the communities' decision-making processes. However, in practice, participation by the public is lacking in substantial content. As a result, public contributions to development plans are limited, lack diversity, and occur only in the early stages, when information regarding conditions and requirements is collected from the community.

(2) Issues concerning regulations that determine the proportion of expenditures allocated to local administrative organizations. Local administrative organizations' expenditures can be grouped into two categories: current expenditures and investment expenditures. The law has stipulated that the proportion of expenditures in both categories cannot exceed 40% of the local administrative organizations' current expenditures. However current expenditures exceed legal requirements, and local administrative organizations have little remaining budget for development.

(3) Problematic issues in the financial control and monitoring of local administrative organizations. The inspection of spending by the public sector is carried out with many limitations. There are also problematic issues with regard to financial audits conducted by the Office of the Auditor General of Thailand, whereby audits are not conducted by inspecting local objectives and affairs, but by inspecting regulatory expenditures, which results in considerable problems for local administrative organizations.

Discussion and Analysis of the Problematic Issues

This section attempts to analyze the fundamental aspects of the local administrative organizations and their future directions. The aim is to search for a new conceptual framework to overcome longstanding problematic issues that have ensnared

progress over the past decade. The points of analysis are summarized as follows:

The development and emergence of local administrative organizations and their present state. The Provincial Administrative Organization (PAO), the Municipalities, and the Sub-district Administrative Organization (SAO) (excluding Bangkok and Pattaya, which are special administrative areas) have had a very short development spans: the municipalities were organized under the Municipal Act B.E. 2496 (1953), the sub-district administrative organizations under the Sub-district Council and Sub-district Administrative Organizations Act 2537 (1994) and the provincial administrative organizations under the Provincial Administrative Organizations Act B.E. 2540 (1997). Meanwhile, considering only the sub-district administrative organizations and the provincial administrative organizations, these organizations cover the whole of Thailand, and they overlap in some areas due to their nature. However, these organizations' missions and duties are divided. In terms of experience, SAOs are only 23 years of age while PAOs are only 20 years of age. From a political and administrative perspective, they are the largest political and administrative organs directly related to the public.

Overall, the foundation of the political system has altered tremendously in terms of its organization. Today, all areas in Thailand are under the administration of the local organizations. Originally, only the regional governments had the authority to govern regionally. This change of power in administration across the country has led to a change in the relationship between government officers and the public. Not only was there a relationship between "officials" and "the people" but, in addition, there was another type of organization in overlapping areas. This organization was the local political organization, with "local politician" playing a key role. The relationship between "local politicians" and "the people" is different from the relationship between "officials" and "the people." The latter is the relationship between the regulators and the regulated, while local administrative organizations whose presence overlaps in the region results in a relationship such as that of "the Patron" and "the protégé"

Thus, the emergence of local administrative organizations is of paramount importance in the breakdown of the strong governing relationship, which is a type of vertical relationship, while the local administrative organizations have created horizontal relationships. From a political and governmental perspective, "local administrative

organizations" have contributed significantly to the creation of a unique political and administrative culture. This culture motivates locals to become increasingly aware and to participate in the creation of local administrators in each of the areas. These changes came with the overnight establishment of local administrative organizations within the nation without respite for other developments or contributing factors. These are the positive outcomes of the changes in governance that have occurred in the last two decades.

As mentioned above, "local administrative organizations" are organizations that have emerged in all areas across the nation, exhibiting a horizontal relationship and a dimension of social patronage. On this basis of social patronage, "people of influence" or "big wheels" in various localities can come to be "politicians" in their local communities, further strengthening the patronage system. While the competitiveness of national politics increases, the patronage system in local politics has been linked to national politics and developed into important an basis for national politics, resulting in a tight system of power relations between "local politicians" and "national politicians," especially with regard to budget allocation to local administrative organizations, which is a significant problematic issue leading to discrepancies and inequalities in fiscal distribution among local administrative organizations. This strong relationship between national politics and local politics is, therefore, like a coin with two sides. Whenever there is a national political crisis or a crisis of faith, local politics are also affected, as it is understood that local politics form a basis for national politics.

Yet, the relationship between the "local" and the "central" can be divided into two dimensions. **The first dimension** is the central dimension, in which national politicians share mutual interests with local politicians. Local politicians are aiming to grow into national politicians while national politicians allocate budgets to the local areas to maintain their power base. Therefore, their relationship is mutually dependent. **The second dimension** of the relationship between the "local" and the "central" is that the "central" are "central civil servants" whose duties are to regulate local administrative organizations, primarily the regular career officers. These regular central officers are linked to "regional officials" and the "local officials," which form networks of relationships in terms of organizational development between "the principle of decentralization" or "devolution of power" and "the principle of centralization." Both principles are contradictory, and their contradictions are revealed in terms of their power and duties, their personnel administration, and their budgeting.

The conflicts between the "local" and the "central" in the last decade are rooted in the second dimension. While the relationship between local politicians and national politicians in the first dimension continues in the form of mutual benefits, the fact that local administrative organizations are still under the influence of national politicians is better for them than if local administrative organizations were completely self-reliant, in accordance with the decentralization principle. Therefore, there are many future challenges to the development of "local administrative organizations" that involve both internal factors within the "local administrative organizations" themselves and external factors, especially from the "central authority," including "political bosses" and "regular officials," particularly those "regular officials" who emphasize "national security" and have no faith in "political bosses" either at the national or the local levels. Consequently, the development of "local administrative organizations" would be even more limited. These are the current state and the problematic issues that the local administrative organizations are facing.

In summary, the establishment of sub-district administrative organizations (SAO) and provincial administrative organizations (PAO) throughout the country helps to reduce the vertical relationship between "officials" and the "people" and to develop a horizontal relationship between the "local politicians" and "the people, " resulting in a local patronage political system. The "influential" or "big wheel" locals become "local politicians," developing ties between local politics and national politics. Therefore, the relationship between the local and the central is of two natures. On one hand, there are mutual benefits provided by national politicians; on the other, there are conflicts with the "regular officials." Therefore, this trilateral relationship poses major obstacles to the development of "local administrative organizations" in Thailand. A better solution to the decentralization of the local administrative organizations requires a new conceptual framework in order to help "local organizations" (including local administrative organizations, local officials, the central government, the regional government, community organizations, and civil society) work together with an emphasis on their mission as the appointed area of focus, especially regarding the well-being of the local inhabitants as their primary goal. Such perceptions would allow the recognition that old conceptual framework poses issues in overcoming present challenges. In such cases, therefore,

a modification of the conceptual framework is required in order to achieve the set objectives.

Furthermore, there are many problematic issues related to the structural design of local administrative organizations with many structural issues of various dimensions, such as the promotion of "the district councils" to "the sub-district administrative organizations." While the appropriateness and readiness in various dimensional capacities were lacking, the geospatial information also overlaps in local administrative organizational structure, and the formulation of local administrative organizations' structure with identical formats. These are all fundamental issues in the formulation of a structural design for local administrative organizations. The decision to establish the regulatory policy of The Sub-District Council and Sub-District Administrative Organization Act B.E. 2537 (1994) was a decision that had a significant effect, creating major cultural changes in Thai politics and Thai governance, as noted earlier. However, this has resulted in the formation of an organic relationship between local politics and national politics under the "patronage system." Moreover, local politics reinforces the strength and stability of the "patronage system." This issue has led to the establishment of the Thai "structural patronage" political system, resulting in even greater difficulties resolving problematic issues regarding the patronage system in Thai politics, as it is an issue that not only concerns individuals but also has become significant at the structural level. This system has infiltrated every aspect of the administrative body, resulting in problematic issues of corruption that have been difficult to address.

Elaborating further on the present structural design of the Thai national political institutions, with regards to the House of Representatives and the Senate, the Thai Constitution B.E. 2540 (1997) has stipulated that both the House of Representatives and the Senate must be chosen through public elections in order to provide a democratic solution in both national councils. However, this organizational system led to a political crisis in Thailand and to the promulgation of a new constitution. The 2007 Constitution requires that the House of Representatives come from public election while half of the Senate continues to come from a selection processes and the other half must come from political appointment. However, as the political crisis still lingered, a new constitution was drafted on August 7th, 2016, stipulating that senators must be chosen through appointment by persons who are knowledgeable, with expertise, experienced, and

professional. Moreover, the senators chosen must have characteristics that will be of benefit to one another or have had experience in various fields of work in society. And, importantly, the division must be split in such a way that all eligible individuals can be in one of these groups. The structure of national political institutions in the past 20 years has been designed to acquire senators in three ways: (a) from election, (b) from both election and recruitment and (c) from appointment. What was the reason for 3 new re-designs in the acquisition of Senators? The reason behind this was the "structured patronage system" discussed above, which has resulted in the entire body politic of the national and local political systems being subjugated by the "structured patronage system" which, in turn, leads to political crises in Thai society. The "patronage system" and the "electoral system" contradict one another. Once the "patronage system" is related to the "electoral system," this result in problems with the "representative system," in that the minor opposition parties stand less chance of having national representatives on their side. This issue concerns the quality of democracy, which is linked to the structural design of the political system. In short, local politics play an important role in reinforcing and strengthening the "structured patronage system," which is an important factor in the political crisis of Thai society.

Using democratic principles as an important base for acquiring local administrators and local council members prevents the intervention of the central authority, such as central officials or regional officials, from handpicking representatives as local executives or members of local councils. If this happens, it will cause a limitation or reduction in the quality of local self-reliance. However, the electoral system can also make a concentration of the local patronage system and vote buying. Since there are only small number of candidates and a smaller arena of political competition, those who have a relationship with national politics will have more advantages. This leads national and local politicians to seek more connections that will, eventually, provide benefits to one another in securing the positions of both local and national parties, hence increasing the stability and strength of the "patronage system."

Although there have already been three alterations to the manner by which new senators are acquired in the past 20 years, the patronage system in the small local administrative organizations still works more effectively, as it provides mutual advantages to both parties. Moreover, the family system, or the kinship system,

in the local Thai community has become one of the major factors that supports the patronage system. In this case, there needs to be some adjustment in the design of more appropriate structures for local political institutions according to their sociological factors. To be exact, the Thai local administrative organizations require a new design construct that fits the requirements for each specific sociological factor. In conclusion, the structural design of the local administrative organizations must consider the possibility of recruiting diverse collaborating parties together, rather than excluding them from the local organic system. Most importantly, any approaches to developing the structural design of the local administrative organizations should include the flexibility to vary depending on the specific characteristics of each locality with its differing and diverse dimensions.

However, as necessary it is to adjust the national political structure, it is also necessary to adjust the local political structure according to the socio-political aspects of that locality. Therefore, it is not sufficient to design the structural institutions based merely on the "electoral principle," as this does not help to eradicate the "patronage system," which has evolved into the "structural patronage system." Meanwhile, the basic aim of the national and local political structure is likely to differ in the following fundamental respects:

(1) While the reorganization of national organizations focuses on balancing and monitoring the use of state power, local organization should perhaps focus more on having the consensus of community members.

(2) The reorganization of national organizations focuses on defining or implementing policies and goals for the benefit of the nation, while the local organizations should only focus on fully meeting the needs of community members.

(3) The reorganization of national organizations should focus on establishing secondary organizations to implement policies; however, the reorganization of local organizations, which already collaborates closely and directly with the public, does not require any other agencies to work as intermediaries.

Therefore, to achieve the purpose of establishing a different kind of organization, either different design requirements or a different type of organization is needed. Reducing the intensity of political competition at the local level-by, for example, creating openings for people in the locality (sub-district headman, village headman), regional

personnel (doctors or local teachers), local personnel, and civil society personnel, along with personnel from religious organizations-to provide greater room for a developmental dimension, which, in addition, may partially reduce local political influences. In this respect, the focus should be shifted to the development of the well-being of the local inhabitants in all dimensions, whether in education, healthcare, or social security as well as the local economy. The maintenance of the physical and mental well-being of local habitants requires the organic and unified participation of all parties involved, sharing the same objective, which is to improve the quality of life of the locals. This is, therefore, the conceptual basis for the establishment of the local administrative organizations whose principles and concepts are different from those of a national political structure. Thus, for Thailand, the "electoral principle" alone lacks a basis for the development of decentralization, and it cannot achieve the mission of a local organization. This is the major reason why local organizations require reorganization to deal with their local challenges effectively and enable greater welfare for their local inhabitants.

The division of governance into various types and levels. The division of governance into various types, with each type containing multiple levels, while all the governance is applied in the same locality, but with differing objectives. This is the fundamental issue of decentralization: the separation of government into central government, provincial government, and local government, all of which contained in any particular province. These public administration activities are carried out in the same locality, superimposed on one another even though they may have different objectives. Their budgeting is also different. The central and regional government utilizes the department's bases in calculating its budget (functional base), while the local government utilizes the area to calculate its budget (area base). These issues lead to the calculation of the budget, the allocation of the budget, the monitoring of the budget and the evolution of budget; however, the problem of corruption is embedded into such budgetary practices, not to mention the ambiguous authority and duties between the central, the regional and the local governments. These problems come at a significant cost to the relationship between the central, the regional and the local government, which may result in conflicting relationships between each level, along with conflicts between personnel. These issues all present barriers to improving the quality of the lives of locals.

Local governments in any particular province also contain superimpositions between PAOs, municipalities, and SAOs, with consideration that PAOs are local administrative organizations are at the top part of the structure, while the municipalities and SAOs occupy the lower part of the structure. The problematic issue of the superimposition, and the ambiguous power and duties, of local administrative organizations is one of the fundamental obstacles to adjusting the organization and its many diverse multi-level relationships.

It can be said that governmental administration, in terms of administrative regulations that concern local administrative organizations, contain both verticals issues, which result from the relationship with the central and the provincial government, and horizontal issues, which result from the relationship between local administrative organizations that overlap geospatially and that are, therefore, challenged by problematic issues of ambiguity regarding their power and responsibilities.

The nature of the problem is that, in any province, there are no less than five types of organizations: namely, the central government, the regional government, the PAOs, the Municipality, and the SAOs. The more organizations that there are, the more problems arise in terms of authority, budget, administration, and personnel boundaries. To alleviate these obstacles that hinder local administration, local personnel must primarily be committed to their geospatial mission. This signifies that local development is their primary priority, while responding to the central government is of secondary importance.

Clarifying geospatial authorities in each of these provinces will reduce ambiguity in the power and duty boundaries between local administrative organizations. This issue, therefore, requires a new organizational structure at the provincial level with the development of the provincial budget as its basis, while budgeting on a functional basis should merely be supplemental. This budgeting methodology is opposite to the present method, which budgets on a functional basis while area-based budgeting is supplementary. Modifications to these fundamental concepts, which utilizes the area basis as the objective when carrying out work missions, leads to budgeting methodologies that utilize the province as the basis and that leads to the utilization of the provinces as the assessment basis, which will result in clarity with regard to their own goals, budgeting, personnel, administration, and evaluation of success.

Conclusion

The administrative organization of the Kingdom of Thailand is divided into many levels, and the local government is also split into two levels. This administrative organization poses numerous obstacles to local development, however. Thus, administrative re-organization requires a new conceptual framework that still includes the central government, regional governments, and local governments as a base for provincial budgeting, but where "provinces" are independent administrative entities. Therefore, the central government, the regional government and the local government in any particular province would have to collaborate to determine the provincial budget and, in terms of administration, aim towards the development and welfare of its people as its main objective.

The brief analysis in this paper is not intended to answer questions pertaining to each problematic issue, but to provide an overview analysis of the conceptual framework with regard to decentralization and its effect on the organization of local governments in Thailand for the past two decades. The original models often resulted in conflicts between the central government and the regional and local governments, most particularly between "regular civil servants" and "local officers." The elimination of any party may not be an appropriate solution regarding administration at the local level. These issues, however, require a new conceptual model that overcomes problematic issues at the local level.

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

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