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The Smart City - A City for All: Improving Migrant Workers' Perception of Smart Governance through Inclusion

สมาร์ทซิตี้ - เมืองสำหรับทุกคน: การพัฒนาการรับรู้ของแรงงานข้ามชาติเกี่ยวกับธรรมาภิบาลอัจฉริยะผ่านการรวมกลุ่ม

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บทคัดย่อ

In 2018, Chiang Mai will initiate its Smart City program, which will attempt to transform the population of Chiang Mai into a digital society under Thailand's 4.0 economic model. Cheaper smartphones and data prices place internet connectivity in the grasp of lower socioeconomic groups in Thailand, including migrant workers from Myanmar. Despite the majority of Myanmar migrant workers owning a smartphone, the key to the Smart City, they face barriers that prevent them from accessing important government information. This research describes migrant workers' perception of the relationship with government service-

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providing agencies in Chiang Mai in order to provide a benchmark score for Chiang Mai Smart City's Smart Governance effort in order to improve the government services and the overall effectiveness of Chiang Mai Smart City.

คำสำคัญ Smart City, Migrant Workers, Smart Governance, Inclusion

Abstract

ในปีพุทธศักราช 2561 จังหวัดเชียงใหม่ได้ริเริ่มโครงการสมาร์ทซิตี้ ซึ่งเป็นความพยายามในการเปลี่ยนโฉมประชากรในเชียงใหม่ไปสู่การเป็นสังคมดิจิทัลภายใต้กรอบนโยบายเศรษฐกิจไทยแลนด์ 4.0 และด้วยราคาของโทรศัพท์มือถือแบบสมาร์ทโฟน และราคาการเข้าถึงอินเทอร์เน็ตที่ถูกลงได้เอื้ออำนวยให้เกิดการเชื่อมต่อเครือข่ายของกลุ่มเศรษฐกิจสังคมระดับล่างของประเทศไทยที่รวมถึงแรงงานข้ามจากประเทศเมียนมา แม้ว่าชาวเมียนมาส่วนใหญ่ที่เป็นเจ้าของสมาร์ทโฟนจะเป็นกุญแจสำคัญในการก้าวสู่ความเป็นสมาร์ทซิตี้ แต่ก็ต้องเผชิญกับอุปสรรคที่ทำให้พวกเขาไม่สามารถเข้าถึงข้อมูลสำคัญของรัฐบาลได้ การวิจัยในครั้งนี้จึงเป็นการอธิบายความรู้ความเข้าใจของแรงงานข้ามชาติที่เกี่ยวเนื่องกับความสัมพันธ์กับหน่วยงานบริการจากภาครัฐในจังหวัดเชียงใหม่ ภายใต้แนวคิดในการสร้างหลักเกณฑ์มาตรฐานเพื่อการเป็นธรรมาภิบาลอัจฉริยะของโครงการเชียงใหม่สมาร์ทซิตี้ที่มุ่งมั่นจะปรับปรุงการบริการของภาครัฐและประสิทธิผลโดยรวมของเมืองเชียงใหม่สมาร์ทซิตี้

Keywords สมาร์ทซิตี้, แรงงานข้ามชาติ, ธรรมาภิบาลอัจฉริยะ, การรวมกลุ่ม

1. Introduction

In the last three decades, Thailand experienced fertility decline resulting in a fertility rate of 1.5 in 2015, which will lead to an 11% or 8.5 million working-age person decrease by the year 2040 (The World Bank, 2016). If not resolved, this dramatic shift in population will likely result in decreased investments and manufacturing of goods and services, which threaten to reverse the advantages received from exploiting its short-lived demographic dividend (Chamratrithirong & Punpuing, 2017). As of December 2015, regular and irregular migrants totaled 3.5 million people countrywide, which accounts for nearly 10% of the Thai national labor force (Chamratrithirong & Punpuing, 2017). If the birth rate trend

continues, more aggressive immigration will be a necessary consideration for Thailand. Despite Thailand's large population of migrant workers and potential demographic necessity, the Thai Government's formal inclusion efforts for migrant workers are minimal, which results in migrants turning to irregular immigration and experiencing inequality, discrimination, and exploitation.

According to Chiang Mai Labor Office data, the province officially has 81,395 'regular' or legal and documented Myanmar migrant workers, which comprises 7.87% of the Province's total work force (1,034,891 workers) (Chiang Mai Labour Office, n.d., p. 10). This number of course does not include the vast number of 'irregular' or illegal and undocumented migrants. While economic opportunity and employment is a factor, migrants from the Kachin, Shan, Kayah, and Mon States of Myanmar come to Northern Thailand to escape Myanmar's persistent armed conflict, which led to the destruction of villages, deaths, and other abuses. Under the Thai Government's economic model *Thailand 4.0*, the Digital Economy Promotion Agency (DEPA) allocated 36.5 million baht for Chiang Mai to become a Smart City, an urban design concept that is theoretically rooted in efficiency, transparency, and equality for all residents, which is thrusted forward by maximum resident participation (Leesa-Nguansuk, 2017). As Chiang Mai nurtures this concept and becomes a 'Digital Content Industry Cluster', the Chiang Mai Provincial Government and Chiang Mai City Municipal Government must determine how they can include the disenfranchised migrant worker population. There are arguments, both economic and social, for the inclusion of migrant workers. From an economic perspective, Smart City Chiang Mai must include and develop all of its residents in order to maximize creativity and innovation, which are the cornerstone concepts of Thailand 4.0. If migrant workers are not included, Chiang Mai potentially loses 7.87% or greater of its potential creativity and knowledge capacity. Under this value-based and innovation-driven economy, maximum realized profits will depend on the city's ability to harness the brain power of all of its people. Another key argument for integrating migrants into the Smart City is that the Smart City concept purports to increase social inclusivity and equity. In fact, DEPA's Digital Economy Strategy 3 is, "Create a knowledge-driven society by building

participation, ensuring inclusivity, and equal usage." (Pooparadai, 2017, p. 10). To this end, a knowledge-driven economy and Smart City requires the participation of all its residents, which increase social equality and, in turn, increases the effectiveness of the Smart City. Essentially, Chiang Mai Smart City (CMSC) must focus on inclusion of all residents in order to maximize the effectiveness of the Smart City programs and consequently maximize the return on investment of 36.5 million baht from the Digital Economy Promotion Agency.

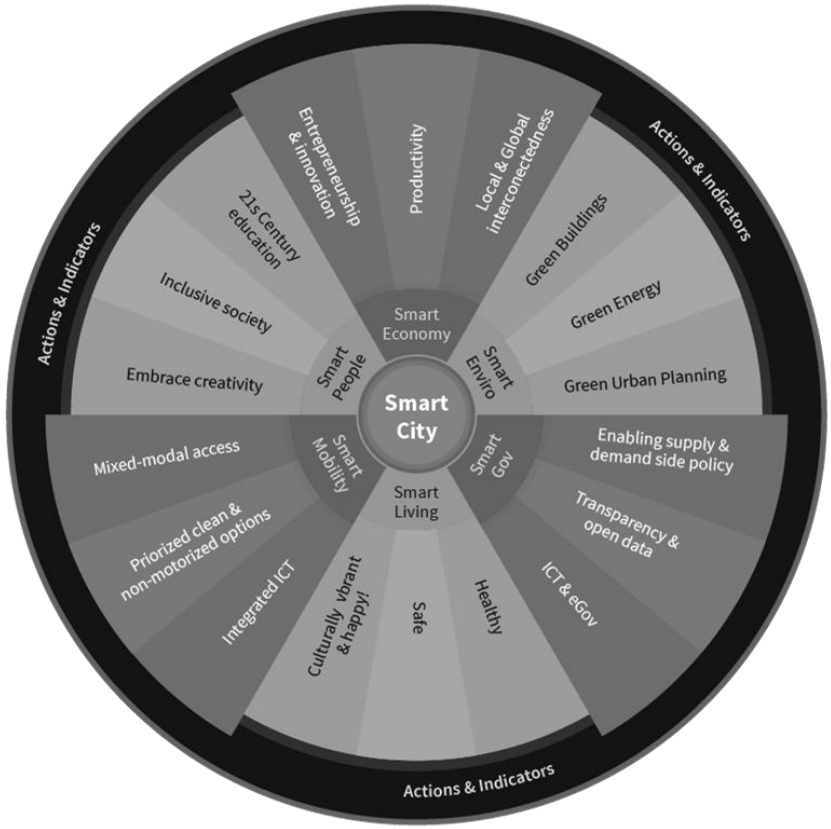
Due to CMSC's recent inception, Chiang Mai faces large information gaps about how CMSC can address the existing governance problems faced by minority groups, especially migrant workers. In the case of migrant workers, there is little academic research that describes the specific problems that migrants face from government service-providing agencies. Hence, this study will describe the relationship using an evaluation framework adapted from the Boyd Cohen's Smart City (2014) studies in order to determine if government service-providing agencies adequately serve migrant workers.

Urban planners, journal publications, and news articles ubiquitously use the term "Smart City". However, the understanding of the term is often ambiguous because the term does not have an accepted definition in any academic field. Part of the reason for the discord over the definition comes from the varying purposes for which the concept has been adopted by cities. As practitioners and stakeholders in the term Smart City, cities that have developed Smart City programs use some or all of the Smart City's theoretical concepts to redefine their own meaning of the Smart City.

Therefore rather than define the term first, it is more logical to define the purposes of the Smart City, the components, and the problems that the concept purports to solve in order to extrapolate possible definitions. The Smart City has three fundamental components and their relationship defines each city's program: the government, the people/users, and technology/ infrastructure. The balance between the three components varies based on their established purposes, which range from increased economic benefit, community interconnectedness, resource sustainability, quality of life, more

efficient government services, and increased governance participation and inclusion. Cohen (2014), a renowned urban strategist, developed a model called the Boyd Cohen Smart City Wheel (BCSCW) to help us think about Smart Cities and allowed him to benchmark Smart Cities across the world, including the Asian Pacific region. His classifications give us six dimensions of Smart Cities and 18 working areas, seen in the figure below.

Figure 1 Boyd Cohen Smart City Wheel



Source: Cohen (2014)

Therefore depending on the purpose of a Smart City program, it could involve all or some of the components from the model and explicates the deviation in Smart City definitions. For example, Smart City Hong Kong uses

the Boyd Cohen Smart City Wheel as an inspiration for its Smart City Plan by focusing on all six of the dimensions (Innovation and Technology Bureau, 2017, p. 2). While some cities do not specifically use the BCSCW as inspiration for their plan, cities in Europe, North America, and South America voluntarily evaluated their city functions using the BCSCW in order to compete in Smart City rankings (Cohen, 2014). To date, Boyd Cohen's methodology is the most extensively used benchmark criteria and is therefore an appropriate tool to evaluate Chiang Mai Smart City.

While cities have contributed definitions as practitioners, researchers and urban planners have also provided definitions of the Smart City. Giffinger, Fertner, Kramar, Kalasek, Pichler-Milanovic, & Meijers (2007) contributed a popular definition by describing the Smart City as, "A city well performing in a forward-looking way in economy, people, governance, mobility, environment, and living built on the smart combination of endowments and activities of self-decisive, independent, and aware citizens." In addition to defining the Smart City, Giffinger, et al. (2007) were the first research team to create a methodology for evaluating Smart Cities. Harrison (2013) more concisely described it as "Cities that seek to make the best use of knowledge and intelligent citizens, administrators, and service providers to improve the design, construction, and operation of the city in various ways." Later, Marsal-Llacuna, Colomer-Llinàs, & Meléndez-Frigola (2015) spoke about citizen services when they defined Smart Cities as,

> *"Smart City initiatives try to improve urban performance by using data, information and information technologies to provide more efficient services to citizens, to monitor and optimize existing infrastructure, to increase collaboration among different economic actors, and to encourage innovative business models in both the private and public sectors."* (Marsal-Llacuna et al., 2015, p. 618)

The Boyd Cohen Smart City Wheel (BCSCW) (Figure 1) is a useful model when developing a new Smart City program or assessing an existing Smart City.

As seen above, his model contains six dimensions: Smart Government (ธรรมาภิบาลอัจฉริยะ), Smart People (พลเมืองที่ชาญฉลาด), Smart Living (การดำรงชีวิตอัจฉริยะ), Smart Mobility (การเคลื่อนย้ายอัจฉริยะ), Smart Environment (สิ่งแวดล้อมอัจฉริยะ), and Smart Economy (เศรษฐกิจอัจฉริยะ).

Within the each of the six dimensions, Boyd Cohen assigns three 'working areas' per dimension. For example, Smart Governance includes Online Services, Infrastructure, and Open Government working areas. In addition to the BCSCW, he also designed the Smart City Index Master (SCIM), which is a tool that provides indicators and descriptions in order to establish evaluation criteria to analyze a Smart City's performance (Cohen, 2014). Cohen's analysis provided him with scores, which he used to compare and rank smart cities across Europe. While the indicators and descriptions are useful, not all of them apply to the context and systems in Chiang Mai. Therefore, for the purposes of this study, the Smart City Index Master has been adapted to fit the context of Chiang Mai.

Table 1 Adaptation from the Boyd Cohen Smart City Index Master (SCIM)

Classification	Working Area	Indicator	Description
Smart Governance	Online Services	Website Accessibility	Number of government agency websites in Chiang Mai which are related to migrant workers that translates information into Burmese or Shan
		Website Clarity	Accuracy and usability of government websites.
	Open Government	Open Data	1) Percent of the population that thinks that government information is open and easy to access.

Classification	Working Area	Indicator	Description
			2) Does the government provide the information that migrant workers want the government to disclose?
		Open Apps	1) Number of government smartphone apps available 2) Number of smartphone apps that offer Burmese or Shan language
		Privacy	Percentage of the population feeling comfortable about providing private information

Source: Cohen (2014)

Over the last decade the Thai Government continued forward rapidly with some major initiatives in fourth generation wireless internet, which allowed Thailand to continually improve its rank in the ICT Development Index (International Telecommunication Union, 2017, p. 31). A 2014 Fletcher School study names Thailand as a "break-out" country and the third largest ranking change between 2008 and 2013 (Chakravorti, Tunnard, & Chaturvedi, 2014, p. 17). Although in 2015, the Smart City Chiang Mai announcement claimed "the city would receive 36.5 million THB, the former ICT Ministry, now Ministry of Digital Economy and Society, plans to spend 200 million baht over the course of three years (Leesa-Nguansuk, 2016). This top-down strategy is intended to propel Chiang Mai as the country's hub for tech services and software development by creating "a knowledge-driven digital society through participation, ensuring inclusivity, and equal usage." (Pooparadai, 2017, p. 10).

Though the theoretical definitions from urban planning scholars are similar, each definition uniquely describes the convergence of technology, governance, and services. Returning to the idea that cities are practitioners that

can also define the Smart City, it is necessary to describe the inputs that shape how Chiang Mai has defined the Smart City up to this point. After the official announcement of the project in 2015, professors from the faculties of Social Science, and Engineering, and the School of Public Policy led the discussion in small forums and larger conferences such as the 13th International Conference on Thai Studies and Chiang Mai Design Week 2016. In August 2016, The Chiang Mai Creative City Development Committee began discussing the idea of the Smart City as an extension of the provincial government's Creative City concept. Since then, academic conferences, government meetings, and independent seminars contributed to the discussion of the Smart City. The funding of Chiang Mai Smart City links directly to Thailand 4.0, in which the government envisions Chiang Mai as a Digital Content Industry Cluster. Hence, the national government's intent for the program is economic in nature. However, aside from Smart Economy, many Chiang Mai academics spoke about the necessity of Smart Governance and Smart People functions. Almost universally, smart cities include Smart Governance in their smart city plans, which likely occurs due to the "top-down" initiation strategies from the government and the appropriations process.

Currently, Chiang Mai faces an extraordinarily complicated governance challenge due to the substantial migrant worker population. Large quantity of laborers are illegal, face social barriers, experience discrimination, and receive substandard pay. The term migrant is difficult to define in the context of Myanmar and Northern Thailand. According to UN Convention of the Rights of Migrants,

> "The term 'migrant' in article 1.1 (a) should be understood as covering all cases where the decision to migrate is taken freely by the individual concerned, for reasons of 'personal convenience' and without intervention of an external compelling force." (United Nations Educational, Scientific and Cultural Organization, n.d.).

In some cases in Thailand, some people clearly migrated from Myanmar to Thailand specifically to receive shelter from violence and are therefore

refugees. However in many situations, because of the length of the Myanmar conflict and the poor state of employment in Myanmar, reasons cannot be clearly delineated. For the purposes of this research, if the person from Myanmar migrated for employment opportunities over the threat of violence, the person shall be considered a migrant worker rather than a refugee. Nonetheless, the migrant worker population, which is comprised of legal and illegal immigrants, is difficult to quantify due to the fact that both legal and illegal migrants often live on the fringes of society. Although the figure is mercurial, with some interviewed migrant worker-focused NGOs suggesting that 200,000 legal and illegal migrants live in Chiang Mai, migrants from Myanmar indisputably make up a significant percentage of the residents in Chiang Mai.

Making matter more complicated, the national government has different immigration processes for migrants from Myanmar, Laos, and Cambodia than so-called “highly-qualified or high-skill” immigrants from other countries. Additionally, many migrant workers consider the immigration process as the most important government service rendered to migrant workers. Migrants from these three countries recently conducted the process of verification and registration during March 2018. The verification and registration included a complicated two-part process to certify previously documented and undocumented workers, which resulted in a new 2-year visa and work permit colloquially called “the red passport”. Previously documented migrants possessed one of two types of visa and work permit authorizations colloquially called “purple passports” and “pink cards”. These two authorizations had different expiration dates but the Thai government changed both authorizations to the new “red passport” before the end of April 2018. The first step in the process included verification at the Embassy of the Union of Myanmar in Bangkok, which consisted of (1) submitting personal identification information such as birth certificates and household information and (2) an interview. Migrants were required to submit the documents in person. After a couple of weeks of processing, the migrant could return to the Myanmar Embassy in Bangkok to collect the paperwork and begin registration. Alternatively, the process could be completed at facilities in

Myanmar. Registration also consisted of two parts: (1) a medical examination (2) paperwork submission and processing. The paperwork submitted at either the One-Stop-Service (OSS) or the Airport Immigration Facility, consisted of a copy of the front page of the previous visa and expiration date, the medical examination results, and the employer data sheet with a copy of the employer's identification card. In 2011, the International Organization for Migration reported similar problems with regularization of migrants included: (a) An inability to develop efficient systems... (b) the absence of one-stop services, (c) lack of information from employers about processes (d) high cost from unregulated brokers and (e) fear among minorities from Myanmar that authorities could misuse personal data (Huguet & Chamratrithirong, 2011, p. 21). Two gaps in information emerge from the factors above: 1) "Do one-stop services (OSS) provide better services?" (2) "How high are the costs of broker services?". In 2017, journalists reported that broker fees cost approximately 7,500 baht throughout the country (Htwe, 2017). However, no journalists or academics have reported data to corroborate the cost of broker services in Chiang Mai. These data gaps combined with the data from Huguet above will necessarily provide context to the overall migrant worker perception about governance in Chiang Mai.

In order to be an effective Smart City and achieve the return on investment, Chiang Mai needs greater understanding of the migrant worker experience with governance systems. The first form of governance that migrant workers experience includes the immigration and work permit processes. Greater services rendered during these processes, without the assistance of oppressive extortion from private brokerage companies, can lead to a greater sense of community and inclusion. Chiang Mai Smart City, like other smart cities, can achieve greater efficacy by leveraging technology and smart systems. However, the linchpin in the success of government agencies is their ability to collect data, process the data into useful information, and change their actions and procedures accordingly.

2. Data and Methods

In order to serve as a catalyst for the Smart City success, this paper aims at understanding how migrant workers view their relationship with government agencies. Based on the literature above, the primary hypothesis that will be tested is as follows: Migrant workers perceive that applicable government agencies in Chiang Mai do not provide adequate services for migrant workers. To systematically test the hypothesis, we adapted the Boyd Cohen Smart City Index Master (reference Table 2) to provide us with indicators and descriptions relevant to Smart Governance in Chiang Mai. Data contributing to the indicators was gathered in three phases, which included both quantitative and qualitative data collection methods of a sample population of 136 migrant workers, which doubled the calculated sample population size of 68 people. This calculation was based on an estimated proportion of the population of 50%, a 90% confidence level, and a significance level of 0.1.

Figure 2 Population Sample Size Calculation

$$n_0 = \frac{Z^2 * p * (1-p)}{e^2}$$

$n_0 =$ Sample Population
$Z =$ Level of confidence according to standard distribution
$p =$ Estimated proportion of the population
$q = 1 - p$
$e =$ Margin of error

$n_0 = \frac{(1.65^2)(.5)(.5)}{(.01)^2}$ $n_0 = 68$ People (*minimum*)

Source: Cochran (1977)

Phase 1 of the research consisted of a preliminary research project about Chiang Mai Smart City and the opportunity for digital acculturation of migrant

workers. This phase included only qualitative research through six interviews and two three-person focus groups. The purpose of this phase was to gather initial data to assist in the creation of the questionnaire instrument used during phase 2. The data in phase 1 was analyzed using the coding analysis technique, in which data was arranged by categories and categorical relationships were explored. During phase 1, two important data points emerged that significantly contributed to the next research phase. First, there is surprisingly a very high smartphone penetration rate among migrants from Myanmar. Second, migrants used the smartphone to create digital social space in which they established support networks, communicated both locally and internationally, and shared important information about government services such as immigration.

Phase 2 of research included a questionnaire, which was distributed to 77 randomly selected migrant workers during March 2018. The questionnaires contained 47 questions about the topics of smartphone use, governance, and inclusion. The questionnaire instrument was written in Thai, English, and Burmese. Although, none of the participants claimed that the questionnaire was difficult to understand, in hindsight, the tool could have included Shan language also. Miscommunications with Shan-only speakers were avoided by assigning a translator assistant to groups of questionnaire participants. During this phase, qualitative data received from interviews provided context to the quantitative data from the questionnaires. The quantitative data obtained from questionnaires was analyzed using descriptive statistics. During Phase 2, six migrant workers participated in individual interviews. Two groups consisting of six and seven migrant workers respectively participated in focus groups. Although not included in the interviews and focus groups, qualitative data from group discussions with directors and staffs of migrant workers NGOs and NPOs, such as the MAP Foundation, BEAM Foundation, and the Baan Dek Foundation provided important context about migrant worker problems. The qualitative data was again analyzed through coding to determine information categories. To conduct analysis of the government agency websites, we tested

the language translation, looked for open data, user-friendliness determined by cluttered website design, and general errors.

The relationships developed during Phase 2, enabled us to partner with the Chiang Mai School of Public Policy to conduct the Chiang Mai Smart City Migrant Worker Design Seminar (MWDS) in Phase 3. The MWDS enabled the collection of more qualitative data, validation of existing quantitative and qualitative data obtained during previous research phases, and the development of policy recommendations through participatory planning. The 28 MWDS participants included six migrant workers, the director of Chiang Mai Smart City, four directors of migrant-focused NGOs, three NGO staff, two medical doctors from the CMU School of Public Health, a health geographer, a political scientist, an urban planner, CMU School of Public Policy staff, and six teachers. During session one, the participants were divided into three groups that discussed the data about perceived migrant worker problems from previous phases of and developed policy recommendations for Chiang Mai Smart City. Session 2 of the MWDS was a large group discussion of newly identified migrant worker problems and the proposed policy recommendations.

The final step of Phase 3 included observations from March 25-28, 2018 at the One-Stop-Service Facility (OSS) and Chiang Mai Immigration Office near the Chiang Mai International Airport during the 2018 Migrant Worker Visa Transition. The purpose of this research was to observe the process and requirements to receive a new visa, observe government services, and collect qualitative data about the treatment of migrant workers at these government agencies. The observation data received during Phase 3 was added to the existing codes from Phase 1 and 2 and aggregated for analysis.

3. Results

The primary working-areas of Smart Governance that this study focused on was Online Services and Open Governance (Reference Table 1). Online services are an important feature for migrant workers because 93.5% of

questionnaire respondents reported owning a Smartphone with access to the internet. Despite a high smartphone penetration rate, online government services in Chiang Mai are limited. For example, the municipal government, provincial government, and the CMSC website all provide information. However, the communication is only one direction: from the government to the user. Consequently, the evaluated agency websites do not have any features of service delivery automation (SDA) for residents to access services via online.

During phase 2 of the research, five applicable government agency websites were analyzed including: (1) the Chiang Mai Municipality Website, (2) the Chiang Mai Provincial Government website, (3) the Immigration Bureau Division 5 website, (4) the Chiang Mai Provincial Labor Office website, (5) the Chiang Mai Smart City website.[7]

From phase one, we discovered that migrant workers believe that language barriers are one of the root causes for their governance problems in Chiang Mai. From the interviews both during phase 1 and 2, migrant workers claimed that many migrants they know cannot read Thai or English. The website analysis during phase 2 confirmed these perceptions of language barriers in terms of online government services. None of the five websites offer website or document translation into Burmese or Shan, the two critical languages for migrant workers. All of the websites featured an English translation button. However, the website translation accuracy varied between all of the sites. For example, the CMSC website provided accurate translation of 100% of the content. However, websites such as Chiang Mai Municipality and Chiang Mai Provincial Government translated only a small portion of the content or provided completely different information altogether. Although translation into English may provide an alternate language, Thailand has a low English language proficiency level, ranked 64 of 88 countries. (Education First, 2018, p. 7).

[7] During the research period of March 2018, none of the five websites were under construction or repair.

When asked about their perception of the CMSC website, two migrant workers answered by saying,

> *"Why [are] there only three language translations [English, Thai, and Chinese]? You know migrant workers cannot read these languages. The website must be translated into Shan and Burmese."* (trilingual male, clothing shop workers, focus group, March 10, 2018).

Both the Chiang Mai Provincial Government and Municipality Government websites provided reports written in Thai such as the Municipal Operational Plan 2561 and notes from provincial meetings. The Immigration Bureau Division 5 website provides immigration documents and user guides. However, the only immigration forms listed in its database are intended for high-skilled workers and are not the proper forms for migrant workers. Additionally, the high-skilled immigration forms are written in English and Thai only. The Chiang Mai Provincial Labor Office provides the best example of open data with its yearly labor reports. Although the vast majority of information in the report would not be particularly useful for migrant workers since it contains labor population statistics and some migration statistics. Despite the yearly labor reports containing useful information for research purposes, the labor office only provides reports in Thai.

Aside from language translation and open data, website user-friendliness and operability is important to government agency online government services. Four of the five agency websites contained an excessive amount of content on each page, specifically the homepage. Excessive content makes it difficult for the user to find important information. For example, the Chiang Mai Provincial Government website's homepage includes 81 buttons and links with 10 drop-down menus that render additional links. When describing the Chiang Mai Provincial Government website, one migrant said, "The Chiang Mai Provincial website has too many buttons, changing photographs, moving words [news tickers and changing text displays], and banners [photograph carousels]." (trilingual female, food service worker, focus group, March 10, 2018). The Chiang Mai Smart City website is the best example of organized information. A focus group that was asked to describe the CMSC

website said that they liked the eight buttons on the homepage because they included a picture that assisted them with understanding the link. For example, the transportation link features the Chiang Mai bus station. One migrant worker said that the CMSC website is “clean”, while another said, “You can find information.” (trilingual male, tailor shop worker, focus group, March 10, 2018). Furthermore, website errors affect the user-friendliness of the agency websites. Other than translation buttons that did not properly translate the website, the Chiang Mai Provincial Labor Office website produced errors when loading various pages. For example, the Download, Blank Job, Labor Info, Labor Situation, Labor Statistics, and the Contact Us pages all registered errors or did not include any information at all.

Although some of the government agency websites did have documents that constitute as open data, many of the websites do not include a repository of open data reports. Nonetheless, when migrant worker questionnaire respondents were asked about whether the though government information was free and easy to access, 10.4% of respondents Agreed and 20.9% of respondents Strongly Agreed. This may indicate that either people are pleased with the increase in open data produced by government agencies or that Thailand provides a greater level of open data compared to Myanmar.

During interviews in phase 1 and 2, as well as conversations with NGOs, migrant workers are most concerned about obtaining legal immigration and legal work statuses. The quantitative data from the questionnaire supports the qualitative data from the interviews. When asked “What type information would you like the government to disclose?”, 50.6% of migrant workers respondents wanted information about immigration. Meanwhile, 49.4% of respondents said that they wanted information about job opportunities.

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Table 2 Types of information that migrant workers want government agencies to disclose

Responses	Frequency	Percent	Percent of Cases
IInnigration	39	32.8	50.6
Healthcare	16	13.4	20.8
Education	12	10.1	15.6
Job Opportunities	38	31.9	49.4
Transportation	2	1.7	2.6
Community Information	5	4.2	6.5
Housing Information	7	5.9	9.1
Total	119	100.0	154.5

Smart Cities can provide government services and information through government applications. The e-Government Agency, an office under the Thailand Ministry of Digital Economy and Society, created a database of free government applications. Currently, the government created 500 and 336 government applications available for Android and iOS respectively, which is located on the Government Application Center (GAC) website. The GAC organizes the applications in various categories such as Health and Public Health, Education, and Labor. All of the applications are offered in Thai, with some applications containing English settings. However, none of the applications have Burmese or Shan language settings. When asked “How many government smartphone applications do you use?”, 35% of respondents said that they do not use any government applications. Despite possible language barriers, 18.4% of respondents reported using one application and 25% of respondents reported using 5 or more government applications.

Table 3 Number of Government Smartphone Applications Used

Question: "How many government smartphone applications do you use?"					
0 apps	**1 apps**	**2 apps**	**3 apps**	**4 apps**	**5 or more apps**
35.1%	18.4%	7.9	7.9	5.3	25.0%

The last indicator of Open Governance is privacy, which a commonly discussed topic involving the Smart City. Smart City residents around the world are concerned with the invasion of privacy as governments use technology to collect more information about its residents. Smart cities purport using obtained data to make better-informed policy decisions, which will benefit residents with more efficient services. However, in order for this relationship between residents and governments to work, the residents must trust that the government has their interests in mind. When asked how much they agreed with the statement, "I feel comfortable giving personal information to the government", more than a third of respondents disagreed.

Table 4 Perceptions of Privacy

Question: How much do you agree with the following statement: "I feel comfortable giving personal information to the government"?				
Strongly Agree	**Agree**	**Neither Agree, Nor Disagree**	**Disagree**	**Strongly Disagree**
9.1%	10.6	47%	19.7%	13.6%

Part of the reason for the scarcity of trust in the government comes from the exclusion, discrimination, and extortion experienced by migrant workers. Language is perhaps one the greatest exclusionary factors, which has already been discussed. However deeper than language, some migrant workers experience social exclusion. During an interview, one Lahu woman reported that discrimination based on skin color started early in school by saying, *"When I was in school, even at an early age, the children in my class and even my Thai*

friends called me "สีดำ" [si dam or black]. I tried not to show emotion, but it hurt." (bilingual female, unemployed, personal communication, March 6, 2018). Another Kachin woman reported exclusion at community events by saying,

> *"One time at a festival, when they [A group of Thai people] asked us where we were from, we answered "Burma". When you say that you are from Burma, the person's face will change. Their face turns gray. Our country [Myanmar] is not popular in a good way. They think we are not civilized."* (trilingual female, student, personal communication, March 7, 2018).

Beyond schools and community events, migrant workers experience discrimination at government offices. Women in a focus group said, "It is easy to say we face discrimination. We feel it. If you are white, the official will treat you different. But if you look like a Thai [skin color] and then speak poor Thai, they treat you worse. They will scrutinize the paperwork because you are Burmese." (bilingual female, food service workers, focus group, March 6, 2018). Another woman added, "Thai officials at the government offices yell and shout at Burmese [people] in front of people and it makes us feel really sad [embarrassed]. They look down on us." (bilingual female, unemployed, focus group, March 6, 2018). These quotes about discrimination support the questionnaire data in which 9% of respondents Agreed and 23.9% of respondents Strongly Agreed with the following statement: "I avoid local community events because I feel discriminated against by local authorities." Finally, all of the interviewed migrant workers said that various forms of discrimination were commonplace.

The findings above support the observations at the Migrant Worker Visa Transition at the OSS and Airport Immigration Facility. The governance problems observed at these facilities could be organized in four main problems: (1) language barriers (2) changing or unclear standards (3) an exploitative system and (4) insufficient immigration facilities during crisis management.

As explained above with websites, the immigration information and procedures for migrant workers the visa transition was complicated. For many migrant workers, the immigration process includes confusing and unclear procedures. An interviewed migrant worker, who speaks English and Thai fluently, said,

> *"They [migrant workers] do not know the steps of the process. For example, you have to go to medical [medical examination] at a government hospital before you can apply for your visa. How do they know where to go? They learn from each other [they receive information by word-of-mouth]"* (quadrilingual male, tailor, personal communication, March 17, 2018)

In addition, migrant worker related NGOs and migrants themselves do not understand the quickly changing standards. The migrant worker above continued, "I am a migrant worker…I can speak English and Thai. Even though it is like my job to help them with the process [I volunteer assisting other migrant workers], I still do not know the changes to the process this time." (Migrant Worker Visa Transition, personal communication, March 17, 2018).

Because migrant workers cannot find, read about, nor understand the procedural changes, many migrant workers must resort to the use of a "broker". Brokers are private Thai businesses that assist migrant workers with their visa and work permit paperwork. The brokers usually perform up to three functions, which determines their price. First, they help migrant workers fill in the immigration and worker permit forms. Second, brokers assist with the employer information. When done correctly, the migrant worker's employer must acknowledge the employment status of the worker by submitting the employer's information and address. Since this is a requirement and not all migrant workers are currently employed, they hire brokers to arrange for a 'fake' employer. Finally, the broker assists the migrant workers with the processing of the paperwork by interacting with the immigration or labor officials. As of March 20, 2018, brokers charged between 7,500-12,500 THB

(235-290 USD) per person, depending on services. The average migrant worker questionnaire respondent earned 168 THB (5.25 USD) per day, which is 45.5% lower daily wages than the required minimum wage of 308 THB (9.5 USD) per day in Chiang Mai. For most migrant workers, the cost for broker services represent up to three months income based on the number of family members they have. This exploitative practice could be mostly avoided by ensuring that migrants can read the documents and understand the visa and work permit procedures.

Finally, the facility and staffing capacity was inadequate for the volume of migrant workers required to transition their visa and work permit during the 2018 Migrant Worker Visa Transition. For example, the OSS, a building designed for about 250 applicants had thousands of applicants each day during the observation period. Due to the lengthy queues, families slept on the ground in the parking lot for up to five days waiting on their visas. The applicants that were in the visa and work permit processing lines stayed in line for 12-18 hours at a time. Finally, the restroom facilities were insufficient, which resulted in many people urinating and defecating in the tree-line around the property and posing health risks to others.

Figure 2 One Stop Service in Chiang Mai

Source: Ling (March 25, 2018)

When Boyd Cohen ranked smart cities throughout the world, he asked 120 Smart Cities to evaluate themselves based on his Smart City Index Master (SCIM) (Cohen, 2014). Each working area was assigned a maximum of 5 points based on how well they addressed the indicators in each working area within the working area. To this end, using the modified SCIM (reference Table 5) Chiang Mai scored a total of 3.75 out 10 points for Smart Governance.

Table 5 Chiang Mai Smart City Index Master: Smart Governance Score

Dimension	Working Area	Indicator	Description	Score per Indicator	Score per W/A
Smart Governance (***Max of 10 Points***)	Online Services (**Max of 5 Points; 1.66 Points per Indicator**)	Website Accessibility **(1.66/5 Points)**	Number of government agency websites in Chiang Mai which are related to migrant workers that translates information into Burmese or Shan	**0% (0/1.66 points)**	**1.5/5 points**
		Website Clarity **(1.66/5 Points)**	Accuracy and usability of government websites.	**50% (0.83/1.66 points)**	
		Open Data **(1.66/5 Points)**	1) Percent of the population that thinks that government information is open and easy to access. 2) Does the government provide the information that migrant workers want the government to disclose?	**40% (0.664/1.66 points)**	

Dimension	Working Area	Indicator	Description	Score per Indicator	Score per W/A
	Open Government (**Max of 5 Points; 2.5 Points per Indicator**)	Open Government Apps **(2.5/5 Points)**	1) Number of government smartphone apps available 2) Number of smartphone apps that offer Burmese or Shan language	**50% (1.25/2.5 points)**	**2.25/5**
		Privacy **(2.5/5 Points)**	Percentage of the population feeling comfortable with providing private information	**40% (1/2.5 points)**	
					3.75/10

Source: Cohen (2014)

While the score is subjective, points were assigned based on the degree to which the descriptions were answered. Higher scores reflected more positive indications. For example, the Website Accessibility Indicator has a maximum score of 1.66 points because it is one of three indicators in the Online Services Working Area. However, no points were awarded to the Website Accessibility Indicator because none of the five websites evaluated translated information into either Burmese or Shan languages. Similarly, 1.25 points were awarded to the Open Government Apps Indicator description 1: *Number of government smartphone applications available* because the Thai government has a large quantity of government applications. Meanwhile, zero points were awarded to description 2: *Number of smartphone applications that offer Burmese or Shan language* because no government applications offer these languages. Therefore, the combined score for the Open Government Apps Indicator is 1.25 out of 2.5 points.

Chiang Mai Smart City scored 3.75/10 points in the two working areas, Online Services and Open Government. The results of the study indicate that more than a third of migrant workers think that government information is easy to access. Just under 65% of the population already uses at least one government application. This data indicates some success for CMSC and provincial government agencies. However, the study also found that CMSC and the government agencies do not translate any government information into either Burmese or Shan languages, which limits the sense of inclusion in the city.

The Smart City Index Master is a tool that provides Chiang Mai Smart City a foundational benchmark score by which the city can measure the Smart Governance. Furthermore, the benchmark score can be used to identify capability gaps so that the city can prioritize resources and personnel to correct the deficiencies. Additionally, the tool can be used in cyclical evaluations to determine the effectiveness of long-term city planning. If cyclical evaluations determine areas of ineffectiveness, government officials and government agencies will have greater understanding of which areas to modify policy and procedures. Consequently, Chiang Mai Smart City should distribute the results from this study to respective government agencies.

4. Discussion

This study found there are four main factors that preclude migrant workers from accessing government services or feeling included in the Smart City: (1) language barriers (2) government agency website design (3) exploitative system practices and (4) exclusionary practices and discrimination. Language barriers are pervasive across all government systems including reading government service information on websites, completing immigration or work permit documents, or communicating with officials at the OSS. Continuing with language barriers, government agency websites often do not offer more language translations outside of Thai and English. Even the English translations often result in missing information or errors on the websites

themselves. Translation software or trained translators appear to be a capability gap for CMSC which the city could prioritize resources to correct.

Migrant workers regularly feel mistreated or discriminated against at government agency offices. Moreover, the government services system informally contains exploitative practices such as the brokerage system. When faced with the choice of obtaining legal status through the assistance of brokers or deportation and fines, many migrant workers choose to hire brokers to ensure they receive legal status. However, this system allows private companies to prey upon migrant workers in one of their most vulnerable situations and charge steep prices, which may significantly limit the quality of life of many migrant workers.

Further research is necessary both about Chiang Mai Smart City's Smart Governance working area, as well as other working areas of the city including Smart People, Smart Living, and Smart Transportation. As Chiang Mai Smart City is in its infancy, there are no other preceding studies, especially about the relationship of CMSC with migrant workers. For this reason, Chiang Mai Smart City must establish cyclical research evaluations to benchmark and analyze its progress in each of the working areas. Boyd Cohen's SCIM provides an excellent tool to evaluate all of the working areas. From a national and provincial perspective, the relationships between migrant workers and government agencies constantly evolve as the national government changes policies. Hence, to adequately inform the Chiang Mai Smart City plan researchers must continually assess these relationships. As seen in the BCSCW (reference Figure 1), more research must be done to determine the relationship between migrant workers and other working areas of the Smart City. During interviews, several migrant workers said that education and healthcare are also immediate concerns in which smart solutions may assist. As Chiang Mai develops its transportation network over the next five years, Chiang Mai Smart City must determine whether Smart Transportation meets the needs of migrant workers or becomes another area in which they are excluded due to barriers. Finally, case study comparisons between other

developing smart cities within the region could provide insight and recommendations into other cities' successful programs and problem areas.

5. Conclusion

This study provides various government agencies in Chiang Mai with objective and foundational evaluation of migrant workers perceptions of their service. In many cases the services rendered by the government agencies, especially immigration and labor services, impact migrant workers' sense of inclusion in Smart City Chiang Mai. Although the observed government agencies adopted some Smart Governance procedures, indicators such as website accessibility and clarity, open data and government applications, and trust in the government highlight gaps in services that deeply impact migrant workers. As the government agencies focus on closing these gaps, Chiang Mai's Smart Governance and the Smart City will be strengthened to provide more effective services to the entire population of Chiang Mai. For example, this article identifies more online government services such as Service Delivery Automation (SDA) as a key gap in Smart Governance. Service Delivery Automation can reduce some of the social and language barriers for migrant workers, provide more opportunities for inclusion, and increase the efficiency and quality of services rendered to all residents of Chiang Mai. As government officials identify capability gaps and potential policy and technological solutions, they can use big data and results from independent studies to prioritize resources and make more effective decisions. The focus on understanding through data collection and analysis, improvement through problem solving, and judicious use of resources to provide services to residents distinguishes the difference between cities and Smart Cities.

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