

Parameters Influencing Citizens' Levels of Satisfaction: Soft Indicators of 'Good Governance'

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Abstract

Previous studies highlighted the importance of soft indicators (e.g., quantitative sociological survey) influencing citizen satisfaction towards municipal service quality. Citizen satisfaction assessments have raised concerns over numerous independent parameters such as gender, age, and education on satisfaction levels toward administrative performance. It is also crucial to underline that the application of sociological survey for improving service quality is not well understood by municipal officers or scholars. To obtain substantial combined multiple indicators of service quality, it seems rationale to reconnoitre numerous parameters of citizen satisfaction and quantitatively investigate impacts of independent variables (e.g., gender, age, education) on corresponding satisfaction levels by using some advanced statistical tools. In this sociological assessment, a targeted population was constructed of Bangkok Metropolitan administration (BMA) stakeholders ($n = 38,500$), which are as follows:

- Bangkok residents in 50 districts under the governance of BMA
- Board committee, executive directors and general staff of 27 BMA offices

This multiple dimensional analysis sociological survey data indicates that gender, age, and education play some important roles in governing municipal citizen satisfaction levels. Overall, the knowledge of relationship between citizen satisfaction levels and independent parameters can enhance the service quality of municipal administration.

Keywords: Bangkok Metropolitan Administration (BMA), Citizen Satisfaction, t-Test, Analysis of Variance (ANOVA), Good Governance (GG), Soft Indicators

1. Introduction

Governance consists of numerous dimensional elements in a state, a market, a network (e.g. family, tribe, formal or informal organization) and thereby affect and announce measures and decision related with public life and socio-economic development (Bevir, 2012; Ehler, 2003). Governance can also be executed by the municipality and/or metropolitan administration, as well as the private sector and civil society (Ehler, 2003). With relation to civil service management (CSM) under the context of metropolitan administration, governance can be ascribed to the frameworks and operations used to control service quality, both 50 BMA districts and 27 BMA offices, in the BMA area and the resources and activities it contains. In order to evaluate the performance of public administration, there are generally two types of indicators namely 'soft indicators' (e.g. satisfaction level) and 'hard indicators' (e.g. resources and outputs) (Bouckaert & Van de Walle, 2003). For Information Technology (IT) industry, hard and soft sides can be referred as 'contract' and 'trust', respectively (Barthélemy, 2003). Although the hard and soft sides are frequently employed individually, both of them play an important role for success based on the assessment of 50 IT outsourcing efforts (Barthélemy, 2003). Empirical data, which were drawn from 370 Greek companies employing the sociological survey measure, indicated that quality improvement and the consolidation of the company's market position are significantly affected by using "soft" and "hard" total quality management (TQM) elements (Fotopoulos & Psomas, 2009).

In order to assess the quality of life, a soft indicator was further developed by using sociological survey based on four dimensions (i.e. environment, socio-culture, economy and governance), which are deeply connected with good governance (GG) (Grieve et al., 2011). In numerous policy descriptions, the topic of GG has been widely discussed and related with the following aspects (Grieve et al., 2011):

- transparency
- participation
- horizontal and vertical integration
- legitimacy
- subsidiarity
- high quality of communication and conflict management
- high quality of learning mechanisms

In spite of numerous interpretations of GG, there are several studies focusing on quantitative analysis by using five-point Likert's scale to evaluate the effectiveness of GG (Kalsi et al., 2009). For instance, both quantitative and qualitative analysis were employed for assessing the effectiveness of Participatory Health Councils (PHC) and their GG in healthy democracy in Brazil (Kohler & Martinez, 2015). A further attempt to test the hypothesis that GG leads to poverty reduction based on the principle of Millennium Development Goals (MDGs) was examined through an empirical panel-data estimation using Worldwide Governance Indicators (WGI) and the poverty headcount ratio in 98 countries (Kwon & Kim, 2014). Unfortunately, the finding did not support the hypothesis that GG leads to poverty reduction, and underlining the immediate requirement to address structural inequality in developing countries (Kwon & Kim, 2014).

A five-point Likert's scale, as a part of quantitative sociological surveys, has also been used in the determinants of patient satisfaction in postmastectomy breast reconstruction (Alderman et al., 2000), the evaluation of customer loyalty associated with optometric businesses (Vuuren et al., 2012), the study of nurses' job satisfaction (Mahmoud, 2008), and the sexual satisfaction on psychological well-being in people with physical disability (Taleporos & McCabe, 2002). Over the past few decades, a five-point Likert's scale has also been applied for a gender analysis of job satisfaction, job satisfier/dissatisfier factors (Cano & Miller, 1992), an investigation of motivational factors of gender, income and age on selecting a bottle of wine (Barber et al., 2006), and a study on the impact of gender on the turnover intentions of highly educated employees (Blomme et al., 2010).

The impacts of independent sociodemographic parameters such as age, ethnicity, gender, socioeconomic status, marital status, and family size were carefully investigated by using a meta-analysis based on data obtained from a quantitative sociological survey (Hall & Dorman, 1990). A meta-analysis highlights that no overall relationship was detected for ethnicity, gender, income, or family size (Hall & Dorman, 1990). A similar meta-analysis was conducted by using a self-completion questionnaire to investigate the job satisfaction and relevant features among 172 health care service employees (i.e. clinic doctors, medico-technical workers and public health workers) in Anhui and Xinjiang provinces of China (Liu et al., 2010). Statistical analysis shows moderate job satisfactions of health care service employees in poor areas, which can be further evaluated by improving their working conditions and reward (Liu et al., 2010).

To understand human behavior in social research, demographic data of study subjects play importance data to categorize human in to variations in categorization. In Psychological study, taxometric methods approach analyzes whether males' and females' psychological attributes differ in categorical ways or dimensional ways (Hyde, 2014). A study in health science in western countries identified both age and gender are associated with health behaviors and beliefs (Deeks, Lombard, Michelmore, & Teede, 2009) but it reported to difference consumer behavior in some Asian Countries e.g. Thailand and Singapore. Men are almost less satisfied with health care service compared to women same as the married and employment status (Djordjevic & Vasiljevic, 2018). In western countries saving and investing behavior found to be influenced by the gender factor in a sense of risk taking where higher in male than female in investing and bigger gap when discussed about saving behavior (Bajtelmit & Bernasek, 1997). Job satisfaction difference between gender paradox was confirmed for the UK, whereas little has been done to test this hypothesis on a cross-national basis (Kaiser, 2007).

In Education study, significant difference in the overall satisfaction of student's opinions towards higher-education service quality was found in term of genders while age, family income are no differences (Palli & Mamilla, 2012). Customer products and service quality satisfaction are intense studies in marketing research in order to understand customer needs and expectation. In order to understand each group of product and

service's customer, marketing researcher adopted variation of customers' demographic data both primary categories such as race, gender, ethnicity, nationality, sexual orientation, physical abilities, social class, age and secondary dimension like educational background, geographic location, income, marital status, military experience, parental status, religious beliefs and work experience to explain customer satisfaction and behavior in specific groups. Thai customers' service quality satisfaction found to be had significant difference among various demographic data such as age, income, occupation, education level. In airline service study indicate that the higher income group is trend to expect higher service quality compared to the lower income group and male customers trend to look at performance matrix of the service more female customers (Cheosakul, 2007). Thai female trend to required more service quality from chain restaurants in term of tangible, reliable and assurance, and elder group were likely to perceived service quality than the younger group. Customer income is a character of customer used in order to do segmentation of target market. In a few studies reports earning or income of customer factor affecting service quality expectation. In a study on expectation in medical tourists found the differ between income groups for the reliability and assurance service quality dimensions (Moreno, 2014). Airline customers earning more than 30,000 THB per month trend to be required less service quality in aspects of reliability, responsiveness and empathy than low income-level group (Kssuvan & Aknit, 2014)

A studied was done in Canada adopting customer service quality satisfaction to discovered government and e-government service analyzed from businesses across Canada to determine their use of e-government and their perceived satisfaction with this technology for public service delivery (Reddick & Roy, 2013). The government service satisfaction from citizen was done in Canada in 1989 and the finding mentioned the demographic variables are found to be significantly different across satisfied and dissatisfied respondents within each service (Roth & Bozinoff, 1989). In 2004, City of Perth local government service satisfaction was studied. The finding reveals the most significant linkage between level of government service satisfaction and demographic data such as gender, age group, specific ethnic and socioeconomic groups (Cripps, Ewing, & McMahon, 2004). As the local government is always 'there' for a range of local needs by the perception of individual and communities, yet it is less clear how citizens identify with this crucial level of government the studies of local government service' users is important to understand in order to fulfill the needs and expectation of its users.

According to the Bangkok Metropolitan Administration (BMA) Act (BE 2528 (1985)), "the administrative area of Bangkok Metropolis shall be divided into districts and subdistricts with territorial jurisdiction belonging to them on the date on which the Act comes into effect. The establishment, dissolution or modification of territorial jurisdiction of a district shall result from an announcement of the Ministry of Interior and must be published in the Government Gazette. If necessary, the administrative areas of a district may be divided into subdistricts. The establishment, dissolution or modification of territorial jurisdiction of a subdistrict shall be in accordance with an announcement of Bangkok Metropolis and must also be published in the Government Gazette" (Book, 2013). The major objective of the BMA is developing and implementing npolicies associated with environmental management, urban planning, security services, household registration, public transport bus services, and public health services. However, in the past few decades, a large number of projects have been conducted in the domain of Sustainable Development Goals (SDGs) (11 SDGs: sustainable cities and communities), an environmental quality assessment (13 SDGs: climate action), the gender-specific composition in asset ownership (5 SDGs: gender equality), and an estimation the number of HIV-infected injection drug users (3 SDGs: good health and well-being) (For more details of the projects, please see Appendix A).

Although there are many projects connected with the principles of SDGs, no studies exist that compare numerous sociodemographic variables on citizen satisfaction (CS) as soft indicators of GG of BMA. Moreover, the impacts of independent parameters of stakeholders (e.g., age, gender, education level, occupations) on CS towards numerous aspects related to SDGs remain unclear. Overall, the main principles of this study can be described as follows:

- (i) To conduct sociological survey for assessing CS of stakeholders on the performance of BMA staff by adopting the five-point Likert scale questionnaire (n = 38,500);
- (ii) To apply some advanced statistical techniques, such as t-tests, an Analysis of Variance (ANOVA), Pearson Correlation Analysis (PCA), and Multiple Linear Regression Analysis (MLRA) to numerically interpret the relationship between independent parameters of stakeholders and their CS on the performance of BMA staff;
- (iii) To introduce the most effective measures for improving satisfactory levels of BMA stakeholders based on a quantitative sociological survey.

2. Research Methodology

2.1 Determination of Sample Size & Sample Design

The main principle of sample design is to carefully chose a set of members from a population that explains of those members precisely describe the key elements of the population from which they were deliberately chosen. Another main aim of sample design is to achieve the highest precision per unit cost (Dattalo, 2008). It is well known that “probability sampling” allow predicts of sampling error to be computed and thus widely used in the field of social sciences (Harter et al., 2010; Özdemir et al., 2011). Four types of probability sampling strategies namely simple random, systematic, stratified and cluster sampling have been used for quantitative sociological surveys over the past few decades (Dattalo, 2008; Harter et al., 2010; Özdemir et al., 2011). In this study, a "two-stage" cluster sampling plan was conducted when the total population was divided into these 77 clusters (i.e., 50 BMA districts and 27 offices) and a simple random sample of the 77 groups is carefully chosen. In the case of considering an adequate sample size for simple linear regression analysis and multiple linear regression analysis, it is crucial to estimate a relationship between independent parameters and a continuous dependent parameter. A previous study shows that this type of estimation can apply the 20:1 rule which indicates that the binary ratio of the sample size to the number of variables in a regression analysis model should theoretically be at least 20 to 1 (Burmeister & Aitken, 2012). Previous studies have been widely used this rule for dichotomous logistic regression, survival analysis and simple linear regression analysis with continuous outcome variable (Burmeister & Aitken, 2012). The number of variables to be included for the sample size computation should involve the number of categories for each parameter. For instance, to find the predictors of CS (i.e., dependent variable) with predictors involving age group (6 categories), gender (2 categories), education level group (7 categories), and occupation group (10 categories) the following would apply:

$$n = ((6 + 2 + 7 + 10) - 1) \times 20 \tag{1}$$

Equation (1) = 480 participants required in the study.

Another protocol of sample size computation for linear regression analysis has been proposed by Green as (Green, 1991):

$$N \geq 50 + 8p \tag{2}$$

Equation (2)

Where p is the number of predictors. Applying the number of predictors mentioned above and Greens method a sample of $\geq 50 + 8 \times 25 = 250$ participants, therefore a sample of 38,500 should be more than sufficient.

2.2 Sociological Sampling Locations

2.2.1 BMA Districts (n = 50)

In this quantitative sociological assessment, a simple random sampling (SRS) method was carefully chosen to obtain precise and comprehensive data from the targeted group by interviewing the stakeholders who received customer services in 50 BMA districts. More details of 50 BMA districts were written in Appendix B.

2.2.2 BMA Offices (n = 27)

BMA offices was deliberately chosen for quantitative sociological analysis. The majority of questionnaire respondents were BMA government officers, private sector employees, and local residents (see Table 1B). More details of 27 BMA offices were briefly described in Appendix C.

Table 1B. A t-test applied in examining gender differences in average level of satisfaction in 18 questions conducted at 27 BMA units.

Male																		
Questions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Aver	5.422	5.453	5.525	5.497	5.480	5.511	5.370	5.314	5.320	5.429	5.491	5.428	5.307	5.321	5.381	5.351	5.342	5.365
Stdev	0.744	0.722	0.668	0.688	0.684	0.680	0.740	0.799	0.799	0.755	0.700	0.754	0.802	0.793	0.775	0.766	0.791	0.791
Count	5540	5539	5522	5541	5539	5502	5520	5397	5382	5537	5537	5538	5441	5430	5448	5471	5442	5477
Female																		
Questions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Aver	5.394	5.435	5.509	5.481	5.474	5.498	5.348	5.298	5.311	5.429	5.483	5.422	5.314	5.322	5.366	5.349	5.338	5.367
Stdev	0.758	0.735	0.683	0.703	0.694	0.680	0.737	0.792	0.789	0.731	0.685	0.737	0.786	0.781	0.765	0.760	0.771	0.770
Count	6738	6737	6721	6738	6738	6699	6687	6550	6533	6732	6732	6734	6612	6591	6607	6645	6614	6642
S	0.014	0.013	0.012	0.013	0.013	0.012	0.013	0.015	0.015	0.013	0.013	0.014	0.015	0.014	0.014	0.014	0.014	0.014
t	2.017	1.381	1.330	1.231	0.462	1.100	1.652	1.091	0.667	0.036	0.585	0.445	0.470	0.056	1.129	0.136	0.320	0.148
S	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Critical t (1.960, p<0.05) t-Test D

2.3 Questionnaire Design

2.3.1 Construction of Sociological Questionnaire

Probably one of the most crucial part of the sociological assessment process is the generation of questions that precisely evaluate the perceptions, attitudes and opinions of the stakeholders. For instance, a questionnaire design in the context of clinical practice should theoretically include well planned protocols to obtain credibility and validity. One should bear in mind that failure to properly draft a questionnaire may inevitably lead to problematic elucidating results and this may influence upon clinical or educational practice (Rattray & Jones, 2007). It is also crucial to underline that the imagination, surveying skill, and experience of the researcher also play a major role in developing an effective questionnaire. The concept of work design often refers to the investigation, generation, and application of the configuration, details, arrangement of tasks and responsibilities and the background in which they are conducted (Borges-Andrade et al., 2019).

The conceptualization process in drafting sociological questionnaires is an academic craft that needs some well trained and experienced specialists. An ideal sociological survey should principally be practical, apprehensible, accurate, non-biased, capable of handling with all tough feedbacks, sufficiently encapsulated, authorized and ethical. The most crucial steps for critical achievement in designing a sociological questionnaire are to decide what data you need, select components for involvement, describe particular requests, compose the questionnaires, characterize the layout, explain the details, manage the pre-test and post-test, and perform the sociological survey.

The sociological questionnaire is composed of three parts, which are:

Part 1: Opinions about the satisfaction level of interviewees and/or questionnaire respondents towards the quality-of-service procedures, speed of services, first-come-first-served basis, politeness of staff, quality of facilities, problem management, and the department's development.

Part 2: Specific opinions about the satisfaction level of interviewees and/or questionnaire respondents towards the quality of projects, development, improvement, supportive efforts, and works in harmony and synchronization with other BMA's departments.

Part 3: General information such as questionnaire respondent's gender, age, education, occupation, place of residency, place of work, and length of employment.

All satisfaction levels can be categorized as follows:

- Extremely satisfied (6 points)
- Very satisfied (5 points)
- OK (4 points)
- Neither satisfied nor dissatisfied (3 points)
- Dissatisfied (2 points)
- Extremely dissatisfied (1 point)

In addition, the scores of answers can be classified as follows:

High (80-100%) Medium (70-79%) Low (0-69%)

2.3.2 Questions in Sociological Survey

In this sociological survey, 23 questions were carefully designed for assessing levels of satisfaction on service quality delivered by BMA staff. Focus is on independent parameters which can potentially impact the level of satisfaction (i.e., age, education level, gender). All details of 23 questions can be described as follows;

Q1. Service procedures are clear and concise

Q2. Services are fast and convenient

Q3. Services are given according to the first-come-first-served basis

Q4. Officials are polite, considerate, and service-minded

Q5. Officials are knowledgeable, informative, and able to answer your inquiries

Q6. Officials are honest and honourable

Q7. Utilizing technologies to increase efficiency of the services

Q8. Contents displayed on social media (such as Facebook pages or LINE) are clear and up-to-date

- Q9. District Office's website is conveniently accessible, easy to use, with data clearly displayed and up-to-date
- Q10. District Office provides convenient and comfortable space for visitors
- Q11. District Office is clean and well-organized
- Q12. District Office provides enough facilities for good services
- Q13. Various channels are provided to receive problems, reports, and/or suggestions
- Q14. Problems reported or suggestions are quickly responded
- Q15. District Office is reliable and dependable when problems arise
- Q16. District Office supports and helps improve Bangkokian's Quality of Life (QOL)
- Q17. Activities organized by District Office involved public participation
- Q18. District Office oversees and improves environmental conditions to make Bangkok one of best-live cities
- Q19. District Office best manages waste in its area of responsibility
- Q20. District Office best manages environmental conditions and pollutions in its area of responsibility
- Q21. District Office best cares for streets, sidewalks, and other infrastructures in its area of responsibility
- Q22. District Office best cares for order and public safety in its area of responsibility
- Q23. District Office best supports and promotes better quality of life for residents in its area of responsibility

2.4 Statistical Analysis

In this sociological assessment, numerous inferential statistics such as t-Test and Analysis of Variance (ANOVA) have been applied for test significant differences between two groups (e.g., gender), more than three groups (e.g. age, educational level and occupation), examine correlations between independent parameters (e.g. age, educational level and income) vs. dependent parameters (e.g. satisfactory levels), and feature extraction of both independent and dependent parameters, respectively. As a part of inferential statistics, t-Test has been widely used for evaluating some significant differences between the averages of two populations, which may be connected in certain features. For instance, t-Test was used to test some significant differences between male and female associated with their satisfactory levels toward the service quality of National Housing Authority of Thailand (NHAT) staff (Pongpiachan, 2018b). A similar study has been conducted to determine the factors affecting stakeholder's levels of satisfaction with Community Partnership Association (CPA) in Rayong Province, Thailand (Pongpiachan, 2018a). ANOVA was employed to assess some significant differences on satisfactory levels of stakeholders toward the service quality of CPA staff with different ages (Pongpiachan, 2018a). In this study, all inferential statistics have been conducted using the Statistical Package for Social Sciences (SPSS) Version 13. In addition, the schematic diagram of research process was clearly illustrated in Figure 1.

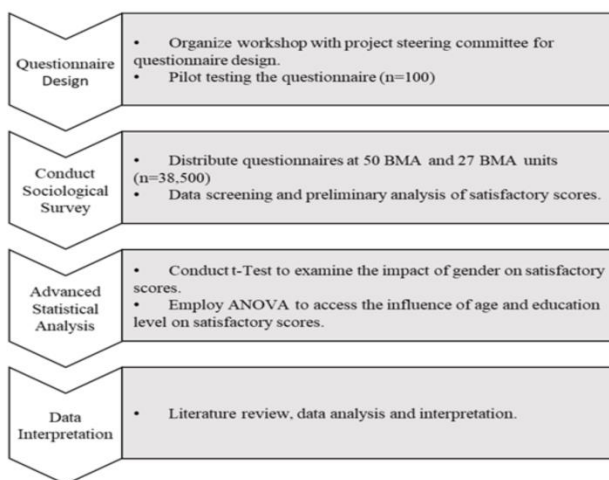


Figure 1. Schematic diagram of the research process.

3. Results & Discussion

3.1 Gender Inequality in Satisfactory Level

A t-Test was applied to investigate some significant differences associated with gender of questionnaire

respondent’s satisfactory levels based on a comparatively large population size of 38,500. As illustrated in Table 1A, it is worth mentioning that gender differences were only observed in questions associated with service procedures are clear and concise. The average satisfactory level of female (i.e., 5.394±0.758) is significantly less than those of male (i.e., 5.422±0.744). This can be explained by several reasons. Previous studies highlight that female apply communication as a means to increase social affiliations and establish relationships (Leaper, 1991; Maltz & Borker, 1982; Wood, 1996). While female are tend to be more expressive, tentative, and polite in verbal communication, male are more confident and ambitious (Basow & Rubenfield, 2003). These different interpretations for a common communication may lead to some dissatisfactions towards daily services of BMA employee. It is also crucial to highlight that earlier studies investigate the intersection of gender and influence tactics (e.g. inspirational appeal, rational persuasion, consultation, ingratiation, personal appeals, exchange, coalition tactics, legitimating tactics, pressure) have led in mixed results (Carli, 1999; Carothers & Allen, 1999; DuBrin, 1991; Lamude, 1993; White, 1988; Yukl & Chavez, 2002). For instance, male appear to employ influence approaches such as personal appeal, consultation, and assertiveness, while female apply strategies such as consultation, inspirational appeal, and ingratiation more with other women and exchange tactics with male (Carli, 1999; Carothers & Allen, 1999; Dubrin, 1991; Lamude, 1993; White, 1998). These gender dissimilarities associated with some influence tactics might have been responsible for a significant difference average satisfactory level towards service procedures conducted by BMA employee.

Table 1A. A t-test applied in examining gender differences in average level of satisfaction in 18 questions conducted in 50 BMA districts.

Male																		
Questions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Aver	5.422	5.453	5.525	5.497	5.480	5.511	5.370	5.314	5.320	5.429	5.491	5.428	5.307	5.321	5.381	5.351	5.342	5.365
Stdev	0.744	0.722	0.668	0.688	0.684	0.680	0.740	0.799	0.799	0.755	0.700	0.754	0.802	0.793	0.775	0.766	0.791	0.791
Count	5540	5539	5522	5541	5539	5502	5520	5397	5382	5537	5537	5538	5441	5430	5448	5471	5442	5477
Female																		
Questions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Aver	5.394	5.435	5.509	5.481	5.474	5.498	5.348	5.298	5.311	5.429	5.483	5.422	5.314	5.322	5.366	5.349	5.338	5.367
Stdev	0.758	0.735	0.683	0.703	0.694	0.680	0.737	0.792	0.789	0.731	0.685	0.737	0.786	0.781	0.765	0.760	0.771	0.770
Count	6738	6737	6721	6738	6738	6699	6687	6550	6533	6732	6732	6734	6612	6591	6607	6645	6614	6642
S	0.014	0.013	0.012	0.013	0.013	0.012	0.013	0.015	0.015	0.013	0.013	0.014	0.015	0.014	0.014	0.014	0.014	0.014
t	2.017	1.381	1.330	1.231	0.462	1.100	1.652	1.091	0.667	0.036	0.585	0.445	0.470	0.056	1.129	0.136	0.320	0.148
S	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Critical t (1.960, p<0.05) t-Test D

3.2 Impacts of Age Towards Satisfactory Level

Previous studies have employed ANOVA to assess the impacts of age towards satisfactory level of numerous stakeholders in social sciences (Pongpiachan, 2018a,b; Pongpiachan & Hashmi, 2020). Over the past few decades, the impacts of age towards different types of satisfactory levels have been intensively studied in different academic disciplines (Hopwood et al., 2007; Johnson-Hillery et al., 1997; Roy & Sarker, 2016). A social survey, which adopted person perception theory to evaluate how retail sales personnel’s perceptions associated with elderly consumers’ satisfaction, suggests that elderly consumers perceived older sales personnel more positively than they viewed younger sales personnel (Johnson-Hillery et al., 1997). A quantitative sociological survey was conducted to investigate the impact of early marriage on female’s health and their satisfactory level in Bangladesh (Roy & Sarker, 2016). In this study, it is found that the early marriage can create detrimental impacts of both female’s physical and mental health. The impact of age and clinical factors on quality of life (QOL) in early breast cancer was carefully investigated by interviewing 2,208 female (mean age 56.9, range 26-87) entering a UK randomized trial of adjuvant radiotherapy (START) (Hopwood et al., 2007). Age had significant impacts on QOL with younger and older subgroups estimating lower QOL for various domains. For instance, female <50 years had poor QOL in respect of anxiety, body image and breast symptoms (Hopwood et al., 2007).

In this section, the impacts of age towards satisfactory level was carefully studied by using ANOVA (p<0.01). No significant differences were found for Q13 (Various channels are provided to receive problems, reports, or suggestions), Q19 (District Office best manages waste in its area of responsibility), Q20 (District Office best manages environmental conditions and pollutions in its area of responsibility), Q22 (District Office best cares for order and public safety in its area of responsibility), and Q23 (District Office best supports and promotes better quality of life for residents in its area of responsibility). A generation gap appears to play a minor role in governing satisfactory level associated with complaint hearings, solid waste and environmental management, public safety and promotions of better quality of life for BMA residents. In spite of these insignificant

differences, there are some concerns related with age. For instance, the elderly group (i.e. 70-89 years) exhibited the highest satisfactory levels connected with Q1 (Service procedures are clear and concise), Q3 (Services are given according to the first-come-first-served basis), Q5 (Officials are knowledgeable, informative, and able to answer your inquiries), Q6 (Officials are honest and honourable), Q7 (Utilizing technologies to increase efficiency of the services), Q12 (District Office provides enough facilities for good services), Q15 (District Office is reliable and dependable when problems arise), and Q17 (Activities organized by District Office involved public participation). These findings can be explained by Thai culture which has its own unique way of honouring elders, and expressing respect towards elderly customers.

Interestingly, the middle age group (i.e. 40-49 years) display the highest satisfactory levels connected with Q2 (Services are fast and convenient), Q9 (District Office's Website is conveniently accessible, easy to use, with data clearly displayed and up-to-date), Q10 (District Office provides convenient and comfortable space for visitors), Q11 (District Office is clean and well-organized), Q14 (Problems reported or suggestions are quickly responded or attended), Q16 (District Office supports and helps improve Bangkokian's Quality of Life) and Q18 (District Office oversees and improves environmental conditions to make Bangkok one of best-live cities). This group (i.e., 40-49 years) can be considered as Generation X (Gen-X) which generally refers to people born during the early to mid-1960s through 1980. It is also well known that common Gen-X characteristics have "work hard, play hard" mentality, strong entrepreneurial spirit, responsibility and try to overcome obstacles on their own. Since Gen-X grew up during the transition from analogue to digital technology, they are relatively flexible to adapt with numerous technological devices such as PC, tablets and smartphones. These explanations were supported by the highest scores detected in Q9 which directly connected with the satisfaction towards IT services. The comparatively high adaptability and flexibility can be found in the highest satisfactory scores observed in Q2, Q10, and Q14.

3.3 Analysis of Variance (ANOVA): The Satisfaction Scores in Relation to Education Level

Previous studies have shown that the education level of questionnaire respondents plays an important role in governing the satisfactory scores (Klein & Maher, 1966; Vila & Garc ía-Mora, 2005). According to the sociological survey conducted in an electronic manufacturing company, the college-educated seem to less satisfied with his/her pay than the non-college group (Klein & Maher, 1966). The impact of education level on job satisfaction was investigated by employing a representative sample of Spanish workers (Vila & Garc ía-Mora, 2005). It was found that the influences of education level on job satisfaction vary in both size and direction based on the perceptions of the job (Vila & Garc ía-Mora, 2005). Alder (2010) explored a relationship between marital satisfaction and the independent parameters of age, education level, and courtship length as well described in her Master's thesis, Pacific University. Although the findings underline that there was not a statistically significant relationship between marital satisfaction, age, education level, and courtship length, there was a negative correlation between post-engagement courtship and dyadic adjustment, emphasizing that, as period of engagement enhances, marital adjustment descends (Alder, 2010). It is also crucial to note that the number of respondents was only 60 ($n = 60$), which can be considered as a relatively small population.

This section classifies the questionnaire respondents into seven groups based on their education levels, as described in Table 3. ANOVA was employed to compare the average satisfaction levels of 23 questions with seven different education levels from the 27 BMA units. Some significant highest satisfactory scores were detected from questionnaire respondents with primary education level. For instance, the average scores of Q1, Q2, Q3, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q21, Q22, and Q23 were 5.46, 5.49, 5.56, 5.45, 5.41, 5.41, 5.53, 5.56, 5.54, 5.39, 5.41, 5.46, 5.46, 5.45, 5.47, 5.43, 5.41, 5.41, 5.46, and 5.50, respectively (see Table 3). On the contrary, the questionnaire respondents with master and/or doctorate degree showed the highest satisfactory scores of Q4, Q5, and Q6. It is also interesting to note that all lowest satisfactory scores were observed from questionnaire respondents with higher secondary education.

These findings are to some extent consistent with previous studies conducted in various countries (Al-Sakkak et al., 2008; Derman and Serbest, 1993). Factors affecting patient satisfactory scores with primary health care (PHC) services were carefully investigated by using a cross-sectional surveyed in three PHC centers, affiliated to Riyadh Military Hospital, Riyadh, Kingdom of Saudi Arabia, over two months period in 2006 (Al-Sakkak et al., 2008). Although there was no relation observed between patient's satisfactory level and their independent parameters (e.g., marital status, gender, income, occupation), patients with lower education level were more satisfied with PHC services than those with higher education level ($p < 0.001$). This result was in good agreement with the fact that the questionnaire respondents with primary education level showed the highest satisfactory scores for most of questions as previously mentioned.

It is also crucial to underline that cancer patients' awareness of disease and satisfaction with services was carefully investigated by using 45 cancer patients interviewed by six attending physicians of the clinic (Derman and Serbest, 1993). It was found that cancer patients with higher education showed the willingness to ask more questions of the physicians and thus receive more direct information from them than those of lower education ($p < 0.0001$). Since the questionnaire respondents with master and/or doctorate degree showed the highest satisfactory scores associated with Q3, Q4, Q5, and Q6, it appears reasonable to conclude that the satisfaction towards the willingness to ask more questions was positively correlated with the communication skill of BMA staff. For instance, the questionnaire respondents with master and/or doctorate degree showed the highest satisfactory scores related with Q5 (i.e., Officials are knowledgeable, informative, and able to answer your inquiries) supporting this explanation. Furthermore, the highly educated questionnaire respondents exhibited the highest satisfaction connected with Q4 (i.e., Officials are polite, considerate, and service-minded) and Q6 (i.e., Officials are honest and honorable). These findings are in accordance with a previous study underlining that the higher education level cancer patients tend to ask more questions of the physicians and thus receiving more information associated with politeness, service attitude, honesty and prestige.

4. Conclusions

According to the sociological survey of the stakeholders related with 50 BMA districts and 27 BMA units ($n=38,500$), the satisfaction of female questionnaire respondents is significantly less than those of male under the topic of service procedures. This can be explained by gender differences in the perceptions of a common communication which may subsequently lead to some discontent towards routine services of BMA staff. Although no age differences were detected under the topics of complaint channels (Q13), environmental and waste management capabilities (Q19-Q20), public safety (Q22), and promotions of quality of life (Q23), the elderly group tends to be satisfied with the quality-of-service procedures, particularly the first-come-first-serve basis. The fact that Thai culture has its own extremely specific way of offering some privileges to elderly people may support these findings. While the primary education questionnaire respondents exhibited the highest satisfactory scores of the majority of questions, the comparatively well-educated group tends to gratify with communication skill of BMA staff.

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Appendix A BMA projects related with SDGs

Title of BMA projects associated with SDGs
(i) Bus Rapid Transit (BRT) has been introduced as a powerful urban transit system in many developing Asian cities as a result of its cost-effective and flexible implementation (Satiennam et al., 2006);
(ii) Several projects have been conducted to monitor the levels of PM2.5, polycyclic aromatic hydrocarbons (PAHs), carbonaceous particles, and heavy metals in the ambient air of the Bangkok Metropolitan Region (BMR) and other major cities in Thailand (ChooChuay et al., 2020a,b,c; Pongpiachan, 2013; Pongpiachan et al., 2016, 2017a,b);
(iii) The gender-specific composition in asset ownership was investigated among low-income, urban households in Bangkok, Thailand in 2002 (Antonopoulos and Floro, 2005);
(iv) Public health services for drug users infected with the human immunodeficiency virus (HIV) were carefully planned based on the estimation of 36,600 opiate users in Bangkok (Mastro et al., 1994).

Appendix B Geographical cluster sampling locations of 50 BMA districts

Abbreviations of geographical cluster sampling locations
Khlong San District Office (D1), Khlong Sam Wa District Office (D2), Khan Na Yao District Office (D3), Chatuchak District Office (D4), Chom Thong District Office (D5), Donmuang District Office (D6), Din Daeng District Office (D7), Dusit District Office (D8), Taling Chan District Office (D9), Thawi Watthana District Office (D10), Thung Khru District Office (D11), Thon Buri District Office (D12), Bangkok Noi District Office (D13), Bangkok Yai District Office (D14), Bang Kapi District Office (D15), Bang Khun Thian District Office (D16), Bang Khen District Office (D17), Bang Kho Laem District Office (D18), Bang Khae District Office (D19), Bang Sue District Office (D20), Bang Na District Office (D21), Bang Bon District Office (D22), Bang Phlat District Office (D23), Bang Rak District Office (D24), Bueng Kum District Office (D25), Pathum Wan District Office (D26), Prawet District Office (D27), Pom Prap Sattru Phai District Office (D28), Phaya Thai District Office (D29), Phra Khanong District Office (D30), Pha Nakhon District Office (D31), Phasi Charoen District Office (D32), Min Buri District Office (D33), Yan Nawa District Office (D34), Ratchathewi District Office (D35), Rat Burana District Office (D36), Lat Krabang District Office (D37), Lat Phrao District Office (D38), Wang Thonglang District Office (D39), Vadhana District Office (D40), Suan Luang District Office (D41), Saphan Sung District Office (D42), Samphanthawong District Office (D43), Sathon District Office (D44), Sai Mai District Office (D45), Nong Khaem District Office (D46), Nong Chok District Office (D47), Lak Si District Office (D48), Huai Khwang District Office (D49), and Khlong Toei District Office (D50)

Appendix C Geographical cluster sampling locations of 27 BMA offices**Abbreviations of geographical cluster sampling locations**

Finance Department (U1), BMA Budget Department (U2), Strategy and Evaluation Department (U3), Office of the BMA Civil Service Commission (U4), The Secretariat of Bangkok Metropolitan Council (U5), The Governor of Bangkok Secretariat (U6), BMA Training and Development Institute (U7), BMA Law and Litigation Department (U8), Administration and Registration Office (U9), Internal Audit Office (U10), Personnel Office (U11), International Affairs Office (U12), Public Relations Division (U13), Inspector General Division (U14), Office of the Permanent Secretary for the BMA (U15), Education Department (U16), Traffic and Transportation Department (U17), Public Works Department (U18), Department of Drainage and Sewerage (U19), City Law Enforcement Department (U20), Fire and Rescue Department (U21), City Planning Department (U22), Social Development Department (U23), Environment Department (U24), Medical Service Department (U25), Culture Sports and Tourism Department (U26), and Health Department (U27)

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