Use of Satisfaction-Satisfaction Matrix (SSM) to Evaluate Japanese E-Government Services

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Abstract: This paper addresses the issue of Japanese e-government benefits evaluation and stresses the need to develop a new measurement tool to evaluate e-government services from the perspective of the Japanese citizen and government service provider. While research has used SERVQUAL, SERVPERF and Importance-Performance Analysis (IPA) as evaluation tools to measure quality of services, most of these tools are developed to evaluate quality of services from the perspective of the user (citizen) or service provider. In this paper, we propose a new evaluation tool, namely Satisfaction-Satisfaction Matrix (SSM), to gauge both the perceptions of the citizen and service provider concerning the performance of e-government services. The matrix not only acts as a useful tool to identify satisfaction responses, but also serves as a strategic decision making aid in the allocation of resources for improving e-government services.

Keywords: E-Government, E-Government Benefits, Evaluation Models, Satisfaction-Satisfaction Matrix.

1. Introduction

Increasingly governments are harnessing the potential of information technology, particularly web-based systems, to control costs, improve service effectiveness and build a stronger link between citizens and government (Verdegem and Verleye, 2009). This is evidenced by the increased adoption and uptake of e-government initiatives by various countries (Wong et al., 2009, 2011; Norris and Reddick, 2013). One country, which has witnessed increased e-government growth, is Japan (Lee et al., 2005; Evans and Yen, 2006; Kudo, 2008). In 2001, the Japanese government set out a plan (e-Japan Strategy) to leapfrog the country into the information era. More specifically, one of the key goals is to invigorate and enhance the uptake of e-government service delivery in Japan. A major outcome of this program is to allow citizens to have access to a number of e-government services which they did not have access to previously. In response, many government departments have introduced e-government services as a means to enhance service quality and become more responsive to the overall needs of its customers. While research has used SERVQUAL, SERVPERF and Importance-Performance Analysis (IPA) as evaluation tools to measure quality of services, most of these tools are developed to evaluate quality of services from the perspective of either the user (citizen) or service provider. In this paper, we propose the use of Satisfaction-Satisfaction Matrix (SSM) to evaluate the satisfaction of various benefits derived from implementing and using e-government services from the citizen and service provider perspectives together.

2. E-government Assessment Tools

Evaluating and assessing e-government performance has become one of the main priorities for decision makers in many countries as governments are increasingly pressured to deliver better quality online services. For the past decade, there has been an upsurge of government activities to make services available online. The quality of e-government services perceived by service providers and users is important in determining and evaluating the performance of e-government systems. To improve the quality of e-government services, a range of evaluation approaches, methods and tools have been developed and applied to evaluate service quality, service performance and customer satisfaction. Some of the commonly used evaluation methods include practitioner evaluation tools (Sharrard et al., 2000; Crooks et al., 2003; Eggers and Goldsmith, 2004; Agimo, 2006), SERVQUAL (Parasuraman et al., 1985, 1988, 1991), SERVPERF (Cronin and Taylor, 1992, 1994) and Importance Performance Analysis (IPA) (Martilla and James, 1977; Ennew et al., 1993; Go and Zhang, 1997; Nale et al., 2000; Yavas and Shemwell, 2001). Despite SERVQUAL having been used by academics to

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measure service quality in public sectors (Edvardsson et al., 1994; Donnelly et al., 1995; Wisniewski and Donnelly, 1996; Wisniewski, 2001, Hirmukhe, 2013), its use as an evaluation tool has been criticized for not being able to be replicated easily, lacks universality, as well as issues of assigning importance - which can help to identify ranking to each of the measured items (Carman, 1990; Cronin and Taylor, 1994; Blose, Tankersley and Flynn, 2005; Wong et al., 2011). SERVPERF, on the other hand, measures only the performance level of the service quality (Cronin and Taylor, 1992, 1994). While IPA has the ability to plot the importance and performance of each attribute in a matrix, it is often used to measure the performance elements listed as attributes from only one perspective, either the citizen or service provider (Wong et al., 2011, 2012). Furthermore, none of the above mentioned evaluation tools – SERVQUAL, SERVPERF and IPA have been able to address the measurements of performance or satisfaction using the same measured attributes to gauge the perceptions of both the service provider and citizen together (Wong et al., 2013).

In light of these challenges, in this paper, a new evaluation tool, namely Satisfaction-Satisfaction Matrix (SSM), is developed to gauge both the perceptions of the citizen and service provider concerning the performance of e-government services. This measurement tool can only be used if the measured performances of these benefits are realized benefits by both the service provider and citizen.

2.1 Satisfaction-Satisfaction Matrix (SSM)

Collected data is plotted using a two-dimensional matrix, where satisfaction from the perspective of the citizen is depicted along the Y-axis and the perspective of the service provider is shown along the X-axis. Thus, four quadrants are created with each quadrant being labelled as "*Very Important Strategic Focus Area", "Important Strategic Focus Area*" and "*Keep up the Good Work*" (see Figure 1).

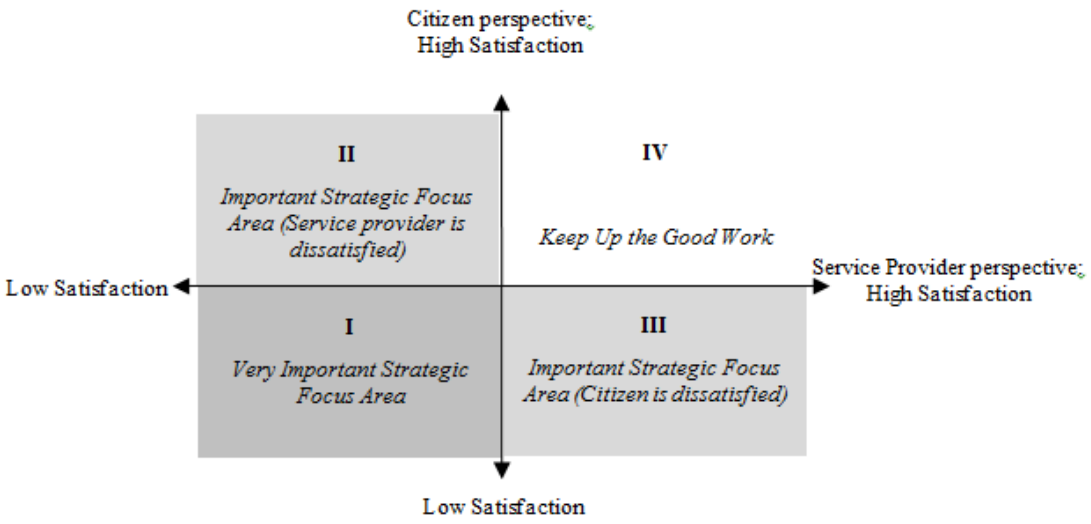

Figure 1: Satisfaction – Satisfaction Matrix (SSM)

In the first quadrant, "Very Important Strategic Focus Area", the measured attributes are below the citizen and service provider satisfaction level. Therefore, the service provider needs to concentrate and improve on all the attributes that fall into this quadrant. The second quadrant, which is labelled "Important Strategic Focus Area", shows attributes that are highly satisfying from the perspective of the citizen, but lowly satisfying from the viewpoint of the service provider. On the other hand, the third quadrant, which is entitled "Important Strategic Focus Area" as well, shows that the measured attributes are highly satisfying from the perspective of the service provider, but lowly satisfying from the side of the citizen. Finally, the last or the fourth quadrant, named "Keep up the Good Work", indicates that both the citizen and service provider are satisfied with the delivery of these benefits. In the matrix, the quadrants gradually fade from a dark (quadrant I) to light color (quadrant IV); a darker color gradient indicates a more important strategic focus area which requires further action to improve both the citizen and service provider satisfaction. This SSM matrix is a useful satisfaction tool to prioritize what's important and what's not and also to study how satisfied or dissatisfied both the citizen

and service provider are in relation to the various measured performance of these benefits, as well as serving as a strategic decision making tool in the allocation of resources for improving e-government services.

3. Evaluation Research and Data Collection Method

Both Rossi (2004) and Babbie (2007) argue that evaluation research is a promising social research method that systematically evaluates whether a social intervention program effectively produces beneficial results. Babbie (2007) argues that evaluation research focuses on research purposes rather than a particular research method. Hence, evaluation research methods do not fall into either quantitative or qualitative categories because they can be a combination of the two research categories. Bennett (2003) asserts that evaluation is a medium to gather information which then leads to better decision making. According to Farbey et al. (1992, 1999), evaluation has four main objectives:

- To be used as part of the process of justification for the invested project;
- Enables the organization to compare the merit (value) of different investment projects competing for the same (limited) resources;
- Provides a set of measures which enable the organization to exert control over the invested projects;
- Evaluation and subsequent control enable a process of organizational learning.

In this research, we used an online survey and applied the Satisfaction-Satisfaction Matrix as an evaluation method to assess citizen and service provider perceptions of e-government services in Japan. Invitational emails were sent out to Japanese government service providers and also Ryukoku University alumni who were e-government users to solicit their input. A survey using a Likert scale was used to measure the performance or satisfaction (1 = very unsatisfied to 5 = very satisfied) attributed to each e-government benefit. Twenty-one e-government benefits were identified from the literature, and empirical data was collected electronically.
E-government benefits are classified as direct (or measurable) and indirect (or immeasurable) benefits. Government agency direct benefits are categorically tangible benefits, for instance, time and cost.

E-Government direct benefits include:

- transactional cost savings;
- processing transactions speedily;
- high speed accessibility;
- reducing customer time spent travelling to government offices;
- decreased customer queuing time;
- decreased face to face interaction;
- petrol cost savings;
- parking cost savings;
- providing faster access to documents and forms;
- having a quicker response time to queries; and
- postage cost savings.

On the other hand, government agency indirect benefits are benefits that are difficult to observe, but nevertheless can be realized. *E-Government indirect benefits* are:

- convenience and availability (i.e., 24 hours a day, 7 days a week);
- keeping customer personal and financial information protected;
- keeping customer data private (privacy);
- giving customer caring and individual attention (i.e., referral to a contact person);
- providing up-to-date information;
- encouraging active participation from citizen (i.e., e-consultation);
- communicating in clear and plain language;
- providing prompt service, and helpful response to customer requests;
- providing dependable and reliable services; and
- being accessible for people with disabilities.

In total, we received 43 responses from Japanese government service providers and 107 responses from the alumni members from Ryukoku University, Kyoto. The collected data was then plotted on the SSM matrix.

4. E-Government in Japan

According to Internet World Stats, as of 30th June 2012, 79.5% of Japan's population are Internet enabled, and they constitute about 9.4% of Asia's total Internet users. In terms of Internet penetration in Asia, South Korea is ranked number one with 82.5%, and is closely followed by Japan with 79.5%. A recent e-government survey study by UNPAN (2012) reveals that the top three countries in East Asia that ranks highly in e-government are South Korea (rank 1), Singapore (rank 10) and Japan (rank 18). A comparative summary of e-government rankings is illustrated in table 1 below. Since the introduction of the e-government survey by UNPAN from 2001 - 2012, these three developed economies have been consistently ranked top three in East Asia. Japan, specifically, has been in third position for most of these years except for year 2008, where it held 2nd position.

Table 1: E-Government Rankings

	2001	2003	2004	2005	2008	2010	2012
Malaysia	59	43	42	43	34	32	40
Japan	27	18	18	14	11	17	18
China	93	74	67	57	65	72	78
South Korea	15	13	5	5	6	1	1
USA	1	1	1	1	4	2	5
UK	7	5	3	4	10	4	3
Singapore	4	12	8	7	23	11	10

Statistically, in 2001, UNPAN revealed that Japan ranked 27th internationally and was one of the top 30 e-government leaders in the world (UNPAN, 2001). The research methodologies that were used to benchmark the global e-government index were twofold: (1) analysis of web content and types of services offered on the national e-government portal; and (2) statistical analysis that compares ICT infrastructure and human capital.
In the same year, the Japanese government launched the Basic Act on the Formation of an Advanced Information and Telecommunication Network Society, where Article 20 of this Act states that appropriate action should be "taken to actively promote IT in administration, such as increased use of the Internet and other advanced information and telecommunications networks in the government of Japan and in local public entities, in order to increase convenience for citizens and to help improve simplicity, efficiency and transparency of administrative operations". In 2003, Japan launched eJapan Strategy II, and as a result, Japan's e-government ranking improved - climbing to 18th position. In 2005, Japan's e-government ranking climbed from 18th to 14th position (UNPAN, 2005). With the "New IT Reform Strategy" launched in 2006, Japan managed to propel e-government further and according to UNPAN (2008), e-government was ranked 11th. Although an IT strategy was launched in 2010 entitled "New Strategy in Information and Communications Technology", it did not help the country leap forward, and Japan's e-government ranking dropped and settled in 17th position (UNPAN, 2010). A more recent e-government survey has shown that Japan's e-government ranking has dropped to 18th position (UNPAN, 2012), and this has prompted the need for research to find the underlying reasons why Japan is lagging behind in terms of its e-government presence. Although Japan is considered a top three e-government leader in East Asia, and top 20 e-government leader in the world, it still needs to continuously improve its ranking by re-organizing e-government services around Japanese citizens and service provider needs.

E-Government literature (Wong et al., 2011) reveals that there is a lack of research on the demand side (perspective of the citizen) about the perception of realized benefits in using e-government services in Japan. Also little research has been done to seek the opinion of the service provider on their perceptions of the realized benefits during the implementation of e-government. Therefore, this research will help to shed light on this matter by introducing the use of Satisfaction-Satisfaction Analysis, as a strategic decision making tool, to bridge the gap analysis of realized benefits from both the citizen and service provider perspectives and also

to identify strategic focus areas that needs allocation of resources to further improve the delivery of e-government services in Japan.

5. Findings

Table 2 shows the 21 e-government benefits that were evaluated from both the citizen and service provider perspective, and the performance or satisfaction of each of the e-government benefits are illustrated. The mean satisfaction from the service provider perspective is 3.28, whereas the mean satisfaction from the citizen perspective is 3.22. These ratings of mean satisfactions were then plotted on the SSM matrix. As a result, government leaders and IT strategists can easily identify areas that need further allocation of resources (See Figure 2).

Table 2: Satisfaction ratings for E-Government benefits from both citizen and service provider perspectives

	E-Government Benefits	**Satisfaction (Service Provider)**	**Satisfaction (Citizen)**	**Quadrant**
B1	Save transaction costs	2.91	3.20	I
B2	Process transactions speedily	3.07	3.36	II
B3	Are accessible at high speed	3.35	3.62	IV
B4	Reduce customer time spent traveling to the government office	3.58	3.60	IV
B5	Decrease customer queuing time	3.42	3.49	IV
B6	Decrease face to face interaction	2.77	2.93	I
B7	Save petrol cost	3.40	3.45	IV
B8	Save parking cost	3.44	3.21	III
B9	Provide faster access to documents and forms	3.42	3.48	IV
B10	Have quicker response time to queries	3.02	3.05	I
B11	Save postage cost	3.44	3.31	IV
B12	Are convenient and available at any time (24 X 7 hours)	3.84	3.74	IV
B13	Keep customer personal and financial information protected (Security)	3.63	3.01	III
B14	Keep customer data private (Privacy)	3.70	3.16	III
B15	Give customer caring and individual attention (i.e., referral to a contact person)	2.95	2.82	I
B16	Provide up-to-date information	3.58	3.47	IV
B17	Encourage active participation from citizen (i.e., e-consultation)	2.88	2.81	I
B18	Website is clear and written in plain language	3.05	2.99	I
B19	Provide prompt service, and helpful response to customer requests	3.21	2.99	I
B20	Provide dependable and reliable services	3.14	2.98	I

	E-Government Benefits	Satisfaction (Service Provider)	Satisfaction (Citizen)	Quadrant
B21	Accessible for people with disabilities	3.07	3.03	I
	Average	**3.28**	**3.22**	

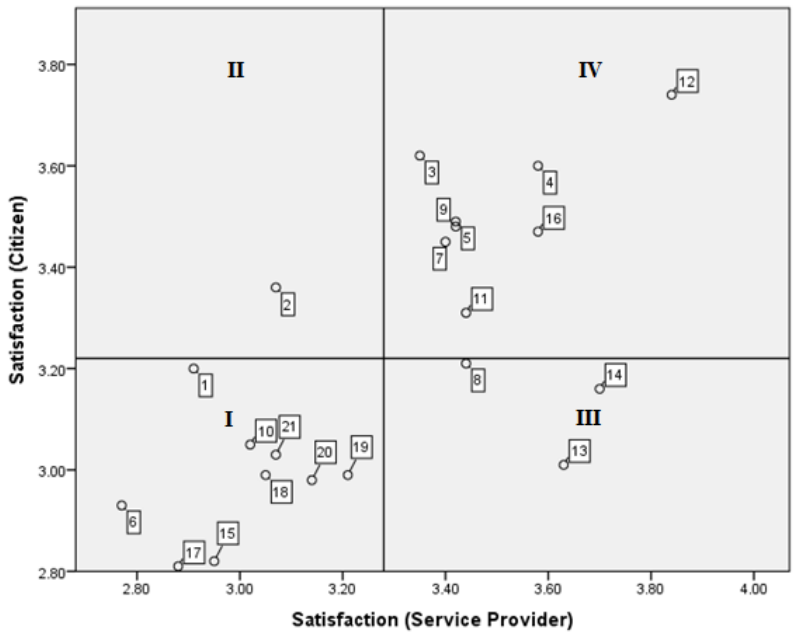

Figure 2: Graphical plotting of e-government benefits on Satisfaction-Satisfaction Matrix (SSM)

Four quadrants are made possible using the intersection made available by the mean level of satisfaction from the perspective of citizen at 3.22 and the mean level of satisfaction from the perspective of the service provider at 3.28. In the first quadrant, "Very Important Strategic Focus Area", both the citizen and service provider perceive performance levels below average and are dissatisfied with the realized benefits. There are nine attributes that fall into this quadrant: save transaction costs (B1), decrease face to face interaction (B6), have quicker response time to queries (B10), give customer caring and individual attention (B15), encourage active participation from citizen (B17), website is clear and written in plain language (B18), provide prompt service, and helpful response to customer requests (B19), provide dependable and reliable services (B20), and accessible for people with disabilities (B21). As a result, policy makers should emphasize on this strategic focus area and allocate resources to improve the performance in this area. Attributes listed in quadrant II, "Important Strategic Focus Area", are perceived to be important because there is a gap level of satisfaction between the citizen and service provider, with citizens showing satisfaction and service provider showing dissatisfaction on the perceived benefits of e-government. One attribute is identified in quadrant II – process transaction speedily (B2). Likewise, quadrant III is also an "Important Strategic Focus Area" because there is a gap level of satisfaction between the citizen and service provider, with the citizen showing dissatisfaction and service provider showing satisfaction on the perceived benefits of e-government. Attributes that are plotted in quadrant III are save parking cost (B8), keep customer personal and financial information protected (B13) and keep customer data private (B14). The IT policy makers will have to find out the reasons as to why there are differing perceptions of satisfaction in realizing these e-government benefits. The last quadrant IV, entitled "Keep up the Good Work", consists of attributes that are perceived to be satisfactory from both the citizen and service provider perspectives. These e-government benefits are: accessible at high speed (B3), reduce customer time spent travelling to government office (B4), decrease customer queuing time (B5), save petrol cost (B7), provide faster access to documents and forms (B9), save postage cost (B11), convenient and available at any time (B12), and provide up to date information (B16). Therefore, any further allocation of resources to support these e-government benefits in quadrant IV would be futile because it is obvious that both the citizen and service provider are content with the results. Initial efforts and resources spent in this

quadrant could have been better allocated elsewhere, especially on activities that can help to increase the realization of e-government benefits that are listed in the "Very Important Strategic Focus Area" quadrant, which needs immediate attention.

6. Conclusions

This research addresses the issue of e-government benefits evaluation, and attempts to gauge both the perceptions of the citizen and service provider concerning the performance of e-government services using the Satisfaction-Satisfaction Matrix (SSM). The SSM matrix can be used as an effective evaluation tool to justify and maximize return on investments and also to help government service providers to identify strategic focus areas, especially attributes that are listed in quadrant I, and to allocate resources to improve both the citizen and service provider satisfaction. Further studies should be conducted not only in Japan but other countries to further test the robustness of the matrix and the findings.[1]

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