E-SmartBox: A Decent Software and Hardware Tool to Enhance Public Service Efficiency and Sustainability

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Abstract: The Ministry of Labour (MOL) is responsible for labour-related public services. The services include employment promotion, skill development, social security, the worker compensation fund, labour protection and welfare. These various services have been mandated to several departments and divisions under the MOL. Service receivers must know where to access a specific service since each service is provided in a different location. Especially in the countryside this becomes a significant difficulty since people do not know where to access a specific labour service. To enhance labour service accessibility MOL service counters had been established. The counters perform as a single window to access all kinds of labour-related public services. The service procedure starts from the service request, filling out a request form, providing required documents, finishing the service, and a satisfaction survey. This procedure takes averagely 20 - 30 minutes for each service access. Additionally, since more than 130 types of labour-related services have to be delivered, working staff have to be intensively trained to be able to deliver these services. Unfortunately, some working staff do not stay in their jobs long. They tend to quit their jobs for better ones. Training new staff to provide such a wide variety of services becomes an obstacle to delivering continual good services. E-SmartBox is a new concept designed by the MOL to solve the problems. It consists of two parts: a hardware part and a software part. The hardware part is a plastic box with a smartcard reader, a web camera and a key pad inside, and can be procured anywhere at low cost. All Thai people aged from 7 to 70 have citizen ID cards which are electronic smartcards. The software has been designed to retrieve personal data from the ID card, to fill and print request forms automatically and to provide a rapid satisfaction survey via the key pad. This greatly reduces the service procedure to less than five minutes. Additionally the software has been designed to assist the staff by providing the knowledge required. They can search for information from the database of more than three hundred frequently asked questions (FAQ) and more than six hundred knowledge items. Presently more than 50 MOL service counters have been established for provinces around the country. The e-SmartBox has been deployed to all service counters since August 2013. After using this tool, service access time has been shortened greatly and the satisfaction increased to 95 percent. The MOL plans to improve this technique for more services in a pilot project of 37 districts in the southern part of Thailand. As regards sustainability, since only widely procurable standard computer accessories have been used, it is easy to maintain at a total cost of less than 50 US$. The software has been developed using the java web start technique; it is easy to be distributed and deployed. This technique can be expanded to other types of service delivery as well.

Keywords: labour-related public service, smart card, web cam, efficiency, sustainability, service counter, one stop service

1   Introduction

E-Government is the use of information and communication technologies (ICT) such as the Internet, wide area networks and mobile computing by government agencies to ensure better delivery of government services. However, the success rate of such endeavours is still relatively low. In developed economies, the success rate of e-Government projects is in the range of 25% - 45% (Bousvert and Kouzmin, 1995; James, 1997; The Economist, 2000), while in developing economies, only 15% of e-Government initiatives are successful in attaining their major goals (Heeks,2008). Previous research has shown that e-Government has many benefits such as convenience in accessing public services and greater opportunities to participate in the democratic process (Fang,2002). Despite its many benefits, many users, after initial trial of e-Government websites, revert back to traditional ways of acquiring information such as personal visits and telephone enquiries (Andersen and Henriksen, 2006).

This failure to retain the interest of users contributes to the failure of e-Government. In general, e-Government websites aim to transform the service delivery and make it easier and more convenient for citizens and businesses to interact with the government (Srivastava and Teo, 2007). The success of any service delivery depends largely upon its perception in the minds of users (Richard and Allaway, 1993), which in turn determines users' retention and loyalty (Reicheld and Sasser, 1990). Although much research has been conducted on eGovernment supply-side metrics (Helbig et al. 2009; Reddick 2005; Reddick 2006), citizen needs

or perceived values have not been adequately accounted for (Streib et al. 2006). While engaging citizens online in a meaningful way remains difficult (Kolsaker et al. 2008), the goal of wider political participation is becoming a pressing challenge as governments seek the creation of public value (Grimsley et al. 2007a; Helbig et al. 2009).

Current survey evidence from developing/transitional countries is very limited. One overview concludes, "successful examples of computerisation can be found, but frustrating stories of systems which failed to fulfill their initial promise are more frequent" (Avgerou and Walsham, 2000). Failure cases seem to be the norm in Thailand at all governmental levels (Kitiyadisai, 2000). Generally, to enhance public service access by using information technology requires changes. The country's change-ability or change-readiness is likely to be a key determinant of a country's ability to achieve e-Government. The change readiness may be not a significant factor for developed countries. However, that may be the case for developing countries like Thailand. The change readiness ranking of developing countries has been reported which gives a comparative ranking of 60 countries (Stiles et al. 2012). Thailand ranked 32nd overall, 46th in the governance sub-index and 13th in the social sub-index. This indicates that the government is not ready for such changes. Although online services have been deployed in parallel with the traditional ones, effective public services still tend to be a traditional face-to-face styled service not the electronic one. Instead of developing an online self-service, developing ICT to facilitate / ensure the efficiency and sustainability of old fashioned face-to-face style services must be one of the right answers for developing countries.

Previous researches show that technical development alone could not realize benefit from ICT. Instead of focusing on the technical perspective, many researchers attempt to address these issues from the human behaviour perspective (Ward et al., 2007). In this paper we introduce an attempt to develop ICT to facilitate traditional face-to-face public services of the Ministry of Labour, Thailand. In order to minimize changes to an acceptable level and to maximize benefit from the ICT development, a stakeholder participation technique (Tawa et al, 2012) is being used. This technique allows public servants and other stakeholders to participate in the ICT development process. This ensures their acceptance and enables benefit realization.

This paper consists of six sections. In section two, the problems of the service provision are illustrated. In section three, the design and development are introduced. In section four, the implementations are described. The discussion is in section five. The conclusions and future works are in the last section.

2   Problems

Since labour is the most important economic driver, good care has to be taken by the government. The Ministry of Labour (MOL) is responsible for labour-related public services which include employment promotion, skill development, social security, worker compensation fund, labour protection and welfare. These responsibilities have been mandated to several departments and divisions under MOL to provide the services. However, each service delivery unit is in a different location. The service receiver needs to know where to access a specific service. Especially in the countryside this becomes a significant difficulty since people do not know where to access a specific labour-related public service. To enhance labour service accessibility 'MOL service counters' had been established. The counters perform like a single window to access all kinds of labour-related public services. The service procedure starts from the applicant seeing an adviser and requesting a specific service, receiving and completing a request form, providing additional document if required, finishing the service, and lastly answering a service satisfaction questionnaire. This procedure takes averagely 25 - 35 minutes for each service access.

All labour from the poor, illiterate, disabled, elderly, immigrants who should have equal access to labour-related public services are affected by these problems. For example, they may want advice on what benefits they should obtain by law, they may want to find a job if they are unemployed or disabled, they may want to know how their pension should be paid and so on. The MOL service counters mentioned above have been established to cope with such services.

Moreover at the service counter, since more than 130 types of labour-related services have to be delivered, working staff (advisers) have to be intensively trained to be able to deliver these services. Unfortunately in many cases the working staff do not stay in their jobs long. They tend to change their jobs when they get

better ones. Training new staff to provide such a wide variety of services becomes another obstacle to delivering continual good services.

So far, the number of service accessed at the service counters has increased; 299,901 in 2010, 351,077 in 2011 and 488,401 in 2012. However, the degree of service satisfaction has gradually decreased, 92% in 2010, 91% in 2011 and 90% in 2012. A problem analysis indicates two main problems. One is that the paper-based document process is tedious and time-consuming. The other is the low service capability due to the problem of staff turnover.

In 2013, the Ministry of Labour (MOL) proposed the project called 'Enhancing service delivery of MOL service counter'. Its mission is to solve the problems mentioned above to improve the performance of the MOL service counters. Three types of services can be delivered at a service counter; the first type is a consultation service, the second is the complete one-stop service, and the third is a referral service. The first type of service is to provide law, regulation, and knowledge including case-based consultation to people. This type requires staff to understand all available knowledge to advise people. The second type is to provide a service-specific request form and let people to fill it out in order to complete the service. Most of the details are personal information; first name, last name, birth date, address, and so on. This type requires staff' knowledge of all available request forms and how they should be filled in. The third type is the service which cannot be delivered by the counter itself, it has to be referred to a corresponding unit. All types require staff to learn many things in order to raise their capabilities. Additionally, various degrees of staff experiences may cause inequity of service quality or misleading advice.

The main problems for the service provision, which are expected to be supported by ICT, are summarized as followed:
- Shortage of knowledgeable advisers.
- Unstable computer network condition of service place.
- Putting personal information (name and address) into the software system is time-consuming.
- Paper-based request forms have to be completed by hand which is time-consuming.
- The service satisfaction questionnaire needs to be completed by receivers which takes time.
- Photo copies of documents is required in some cases which is time-consuming.
- A personal photo is required in some cases which is time-consuming.
- Hand-writing the service reminder (service receipt) is time-consuming.

3   E-SmartBox: Design and development

The project 'e-SmartBox: Enhancing MOL service delivery' was established. The main supporters of the project include labour experts from all departments and divisions, the consultant team and all employees at the MOL service counters. The most important stakeholders are the people who access the services from MOL service counters around the country.

To solve the problems, a knowledge committee and task-force for MOL service counters has been established to conduct the stakeholder participation. The committee is mandated to formalize basic required knowledge for counter staff. The committee consists of labour-related experts from all departments under the MOL. The committee had been working collaboratively with MOL service counter staffs and finally formalized a set of basic knowledge for service counters. The knowledge becomes formal labour-related information for consistent service quality to all people.

The e-SmartBox is a hardware and software combination designed to handle the knowledge database and to automate request forms generation. The hardware part is a plastic box with a smartcard reader, a web camera and a key pad inside, and it can be procured anywhere at low cost. Figure 2 shows the hardware of E-SmartBox.
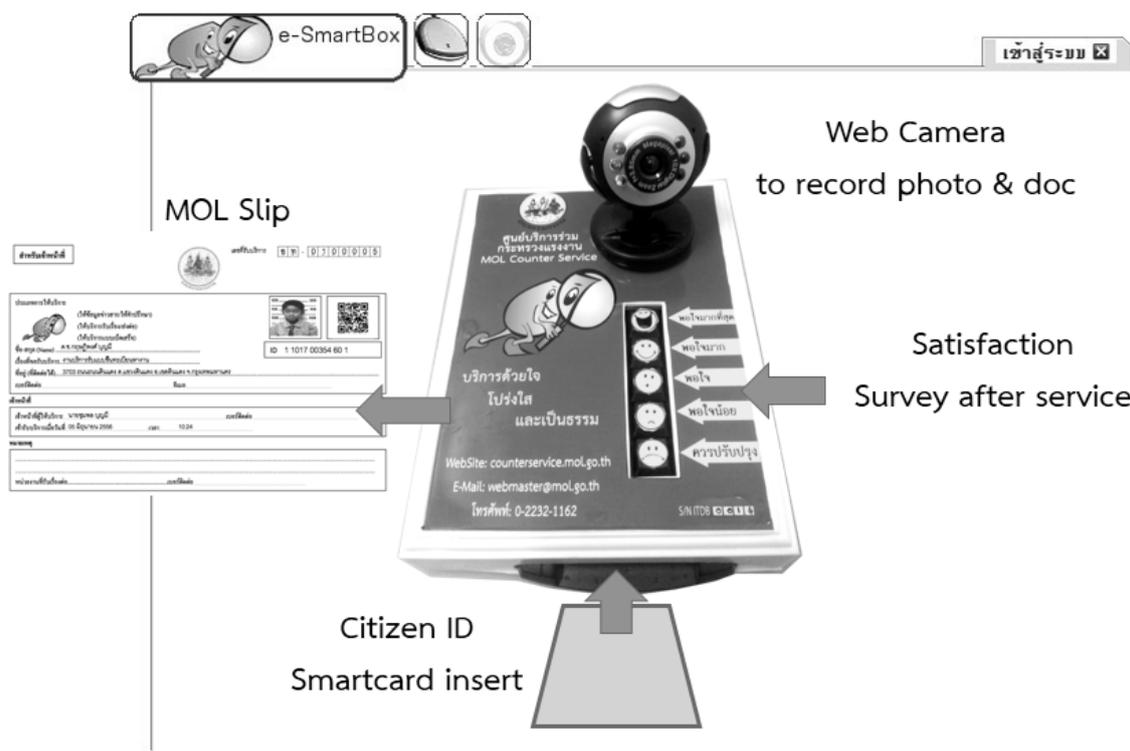
Figure 1: E-SmartBox hardware part

The purposes of designing and developing E-SmartBox include:
- improving efficiency of the public service delivery and response to public requirements;
- improving the capabilities of the service provider staff;
- enhancing service delivery satisfaction.

All Thai citizens aged between 7 to 70 have had citizen ID cards at no cost for years. Personal information is stored electronically in the card and can be retrieved for use. Wide use of the cards has been very limited. The e-Government software developed today tends to be designed in an on-line or stand-alone self-service style. This initiative introduces a unique idea of using the combination of ordinary computer accessories and citizen ID cards to facilitate a human-based service delivery and to enhance its efficiency and quality. The main problems include tedious and time-consuming paper-based documentation and the shortage of knowledgeable staff.

The 'e-SmartBox' initiative solves these problems as follows.
- The paper-based document process. The initiative reduces the time required for filling out various request forms, making a copy of documents and the satisfaction survey by using smartcard reader, web camera and key pad.
- Service quality. Frequently asked questions (FAQ), service provision guideline and corresponding knowledge items have been collected and organized into electronic format (MS excel file) by knowledge committee for MOL counter service. This knowledge is deployed with e-SmartBox to assist counter assistants.

Figure 2 shows a screen shot of E-SmartBox software. Following are steps on how it works.
- First the service receiver inserts his/her citizen ID card. (All Thai people have the card.)
- The personal information is retrieved. No more basic personal information is asked.
- The counter assistant types key words to find the appropriate knowledge database.
- If a request form is required, a partially filled out request form will be printed out via the printer.
- If a photo copy of the document or a person's photo is required, the attached camera is used.
- Finish the service by printing out the MOL service slip for the receiver.
- For the satisfaction survey, the attached key pad is used.
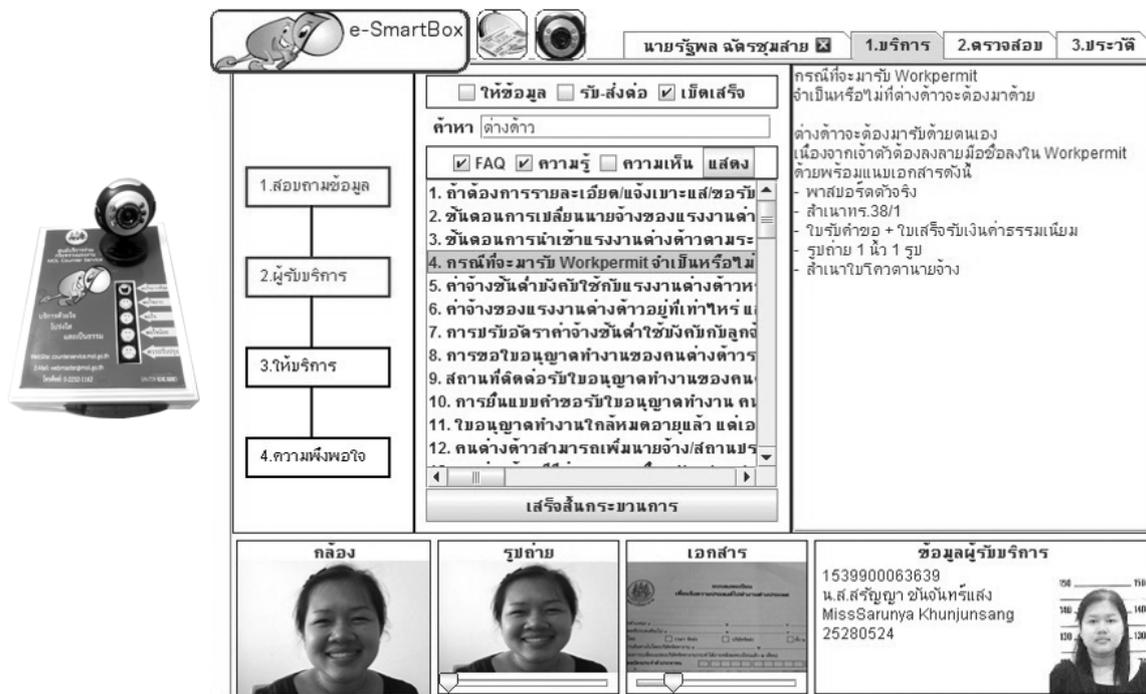
Figure 2: E-SmarBox software part

4   Deployment

All Thai people aged from 7 to 70 have citizen ID cards which are electronic smartcards. The software has been designed to retrieve personal data from the ID card, to fill out and print the request form automatically and to provide a rapid satisfaction survey via key pad. This greatly shortens the service procedure to less than five minutes.

Additionally the software has been designed to assist the staff members by providing the knowledge required. They can search for information from the database of more than three hundred frequently asked questions (FAQ) and more than six hundred knowledge items.

The output of the project includes
▪   The knowledge committee has been established and functions well.
▪   The knowledge items include
▪   *351 items of frequency asked questions (FAQs) to support staff*
▪   *650 items of knowledge to support staff*
▪   *133 types of services which are provided at counter service*
▪   *working processes have been redesigned and developed to conduct service delivery*
▪   *16 types of service request forms can be produced, automatically filled in*
▪   E-SmartBox tools have been developed and deployed in more than 50 service points
▪   More than 100 staff members have been trained for e-SmartBox readiness
▪   Service time has been shortened from 25-35 minutes to less than 5 minutes

Presently more than 50 MOL service counters have been established for provinces around the country. The e-SmartBox has been deployed to all service counters since August 2013. After using this tool, service access time has been shortened greatly and the satisfaction increased to 95 percent.

5   Discussion

Most Thai people aged 7 - 70 years have had citizen ID cards by law at no cost for years. Personal information is stored in the card in electronic format and can be retrieved for use. For the time being the wide use of the cards is very limited. The computer software for public services developed today tends to be designed in an on-line or stand-alone style to serve citizen directly without human involvement. There is very little software

development to facilitate and to enhance personal service delivery. This initiative introduces a unique idea of using the combination of ordinary computer accessories and the citizen ID card to facilitate a human-based service delivery to enhance efficiency and quality.

Law and regulation are also obstacles which can hardly be changed in a short period. With this initiative no hurdle of law and regulation exists since it uses the existing paper request form methods. The E-SmartBox tool is only used to improve efficiency and effectiveness and to free staff from knowledge requirements and leave a few difficult services to the knowledgeable workers. This characteristic makes administration transformation easier.

This initiative includes two components. One is continual collaboration of labour experts from various service providers. This produces a qualified up-to-date knowledge to support service delivery. The other component is e-SmartBox, a hardware and software combination tool. This enables service delivery to be easier and more efficient.

5.1   Financial sustainability

E-SmartBox hardware consists of easily procurable standard computer peripherals at low cost. They include a web camera, smartcard reader and key pad. It costs around 50US$ which is very low. To maintain the facilities low financial support is required. The E-SmartBox can be used with any ordinary personal computer. For the software side, up-to-date knowledge items and request forms can be produced/reproduced easily, using MS excel file without any technical computer programming skill. Therefore the initiative is financially sustainable.

5.2   Social and economic sustainability

Presently Thai people communities are concentrated around big stores/shops/markets. Many people go to big stores/shops/markets to buy food and necessities after work or after school. The transportation is very convenient from/to big stores/shops/markets. Most people do not want to go to government offices just to access public services. At present, on-line public service through the Internet may be too early for Thai people since not all people feel confident to access the Internet. Most MOL service counters are located in big stores/shops/markets and can be accessed with high availability. The e-SmartBox tools have been deployed in all counters and tend to be expanded. This initiative is suited and sustainable to Thailand, both socially and economically.

5.3   Cultural sustainability

Thai people are generally not diligent. They do not like filling out paper-based request forms to access public services. However, they still feel more confident with paper-based services than paperless ones. The E-SmartBox tools free them from writing and bringing documents, while providing them with confidential services. This initiative perfectly matches their culture and is thus culturally sustainable.

5.4   Environmental sustainability

The e-SmartBox hardware consists of standard computer accessories. They can be procured/maintained anywhere by anyone. Materials used in e-SmartBox can be reused and replaced easily. They can be used together with all existing ordinary computers. The reusability is greatly increased. Thus this initiative is also environmentally sustainable.

5.5   Regulatory sustainability

This initiative assists service delivery without any changes of existing laws and regulations. Thus this is sustainable in terms of regulations.

The initiative is also transferable because
- Despite the diversity of knowledge required for service delivery, the e-SmartBox helps staff with up-to-date knowledge. This initiative can be transferred effortlessly to other units.
- The design of e-SmartBox hardware is simple. The materials required for hardware are open-standard and easy to find; web camera, key pad and smartcard reader. The reproduction of the equipment can be performed without difficulty.

- This initiative can be adapted to other types of public services other than labour-related services by replacing or adding more knowledge.

6   Conclusion and future work

This initiative comprises two components. One is continual collaboration of labour experts from various service providers. This produces a qualified up-to-date knowledge to support service delivery. The other is e-SmartBox, the hardware and software combination tool. This enables service delivery to be easier and more efficient.

Labour is confronted by many problems caused by the economic crisis. The problems include unemployment, ignorance of benefits from the social security fund and workers' compensation fund, ignorance of the labour protection law, difficulty in accessing public service and so on. This initiative solves or mitigates these problems. The software system E-SmartBox helps by providing plenty of knowledge for counter staff. It eases the access to public services by shortening the service process and assisting staff with up-to-date knowledge. The overall time taken for one service delivery is shortened from 25-35 minutes to less than 5 minutes by using e-SmartBox. The e-SmartBox tools have been developed and deployed in 51 MOL service counters. This initiative is now planned to be improved to support more than 37 service delivery units next year. So far the service receivers' satisfaction has increased by 95 percent. The e-SmartBox software can be executed both on-line and off-line. This initiative can easily be expanded further at a low cost. The service quality is exactly higher or equal to existing paper request form based services.

The initiative can be extended to more MOL counter services by producing more e-SmartBox tools. It can also be extended to more service providers other than MOL counter services. For example, it can also be performed at municipality and other local government offices to enhance their service capabilities. Knowledge items can be modified to fit to the need of service provider units through electronic files. New knowledge items can be created in MS excel sheet file format (.xls) and imported to the e-SmartBox software directly. New request forms can be added or modified by using Adobe's public document format (.pdf) and can be configured without technical programming skill. The knowledge items and request forms should be reviewed and made up-to-date by correspondent knowledge workers.

MOL plans to improve this technique for more services in a pilot project of 37 districts in the southern part of Thailand. As regards sustainability, since only widely procurable standard computer accessories have been used, it is easy to maintain at the total cost less than 50 US$. The software has been developed using java web start technique, it is easy to be distributed and deployed. This technique can be expanded to other types of service delivery as well.

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