

Mobile Learning Practice –A Preliminary Study on a Mobile System of Customs Cargo Inspection

Jung-Tsung Yang¹, Rong-Jyue Fang², Chien-Chng Lin³, Li-Ling Hsu⁴, Ming-Zong Huang⁵

²Chair Professor, Department of Information Management, Southern Taiwan University of Technology, Taiwan

³Professor, Business Administration & Management, Meiho Institute of Technology, Taiwan

^{1,4,5}Graduate student, Department of Industrial Technology Education, National Kaohsiung Normal University, Taiwan

No.65, Jhennan St., Fongshan City, Kaohsiung County 830, Taiwan

Abstract: - M-learning is growing very fast and many universities and companies are already supporting in some way an m-learning solution. The domain of m-learning can include a wide variety of applications and new teaching and learning techniques. Mobile devices can facilitate human interaction and access to information resources anytime and anywhere, such as cell phones and personal digital assistants (PDAs) are widely used in daily life for various purposes.

The development of economic globalization causes the rapid increase on the business of customs import and export clearance. To enhance the competitiveness of industry, the government has been promoting to expedite clearance and simplify the standard operation procedure. Therefore, the anti-smuggling operation should be more flexible and active to control the information of customs clearance. To achieve this aim, a PDA online query system was suggested for the staff in quay and container yard. They can search for the newest information with PDA, such as dynamic materials of the container, procedure of Customs clearance of the container, and the name of the container, when they leave the office and find any suspicious container number, to advance the ability and performance of anti-smuggling operation.

Key-Words: - Mobile learning (M-learning); PDA; Anti-smuggling operation; Evolutionary Development Model; GPRS

1 Introduction

The internationalization and liberalization of trade advance the development of import and export trade. To enhance the country and industry's competitiveness, the Executive Yuan promoted the automation of cargo Customs clearance and constructed its information network to make Customs clearance convenient for its rapidly growing amount. After the automation was implemented, paper work has been gradually replaced by computer to expedite clearance. A flexible and active strategy of anti-smuggling operation should be adopted to control the process of Customs clearance.

The learning methods are diverse due to the advancement of communication technology. Mobile learning thus comes into existence combined with electronic training and mobile communication technology. With the development of mobile phone, PDA (Personal Digital Assistant) and broadband, a PDA online query system was designed to make inspection more active. Its convenience makes the inspection staff control the dynamic information

without limitation of space and time.

2 M-learning

A survey on US mobile industry found that mobile device sales grew by 40% between 2002 and 2003, and predicted that PDA/mobile phone sales will outstrip PC sales by 2005 with the majority of companies switching to wireless networks by 2008 [1]. M-learning is e-learning through mobile computational devices: Palms, Windows CE machines, even your digital cell phone [5]. M-learning is often defined as e-learning through mobile computational devices. In general by mobile device we mean PDAs and digital cell phone, but more generally we might think of any device that is small, autonomous and unobtrusive enough to accompany us in every moment in our every-day life, and that can be used for some form of learning [7]. M-learning has the potential to further expand where, how, and when we learn and perform in all the aspects of our life. One of the key benefits of

m-learning is its potential for increasing productivity by making learning available anywhere and anytime, allowing learners to participate in educational activities without the restrictions of time and place [6].

Mobile technologies enrich learning possibilities even more and take it further. Mobile devices have the power to make learning even more widely available and accessible. Imagine the power of learning that is truly 'just-in-time', where you could actually access training at the precise place and time on the job that you need it [4].

M-learning provides more mobility, flexibility and convenience. There are several benefits in m-learning implementations. One of most significant benefits is reduces the cost of training. In addition to cost benefits, organizations prefer m-learning for its promises to: rapidly develop, deploy and update course; provide effective training, available anytime and anywhere; boost worker productivity; broaden training opportunities; stay competitive.

3 Systems development

PDA on-line query system adapted Evolutionary Development Model. The development Model sees Fig.1.

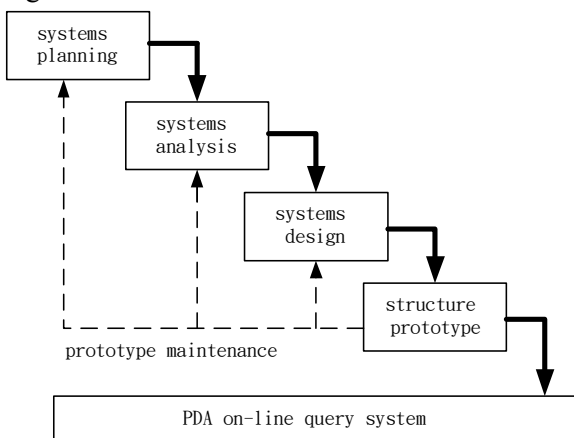


Fig.1 systems development model

3.1 Systems planning

Systems' planning is the first phase of the systems development. During the systems planning phase, the information systems department examines the systems request and conducts a preliminary investigation to determine whether further development is justified [2]. In order to cooperate with user's demand effectively, the system often uses documents analysis, observation, interview, questionnaire, meeting and developing jointly. These methods can be applied alone, or blended. PDA on-line query system

adopted documents analysis, observation, interview and meeting to understand user's demand.

3.2 Systems analysis

Systems analysis is to learn exactly how the current system operates, to determine and document what the system should do, and to recommend alternative solutions [2]. PDA on-line query system used documents to define the systematic function in detail after understanding the system planning.

3.3 Systems design and structure prototype

The purpose of the systems design is to develop an information system design that satisfies all documented requirements, whether the system is being developed in-house or purchased as a package. During systems design, you make a logical determination of what the system must do, not how it will be done. You must identify all necessary outputs, files, application programs, and manual procedures [2]. The point of setting up the system prototype is to transform the defined software specification in the paperwork into the useful and practical software, and to transplant such software into user's working environment.

4 Data transmission structure of PDA on-line query system

Each PDA has a specific IP for security during data transmission via Internet. Data will be transmitted through GPRS service (General Packet Radio Service) from a PDA to its local access point before entering the communication machine room. Data are fully protected because of being encrypted (including compressed and verified) by the router from VPN (virtual private network) before being transmitted. The PDA query server needs to obstruct any hacker's invasion with the firewall and gateway when connecting with the database

The data transmission structure is on Fig.2.

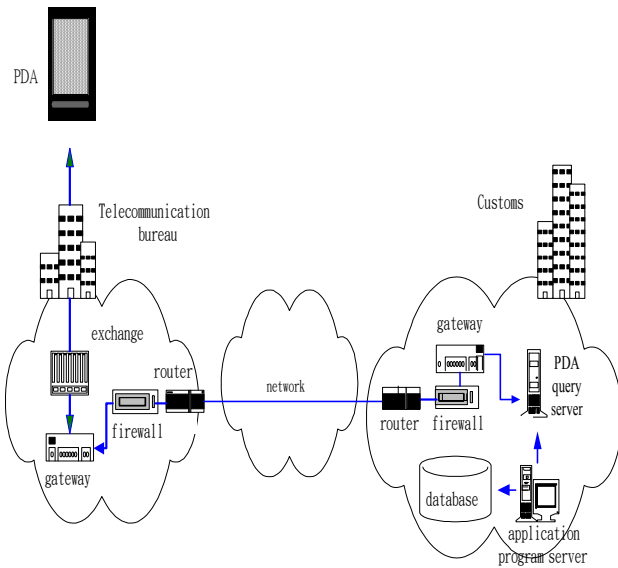


Fig. 2 The data transmission structure of PDA on-line query system

5 The content and function of the system

The content and function of PDA on-line query system see Fig. 3 and explain as follows.

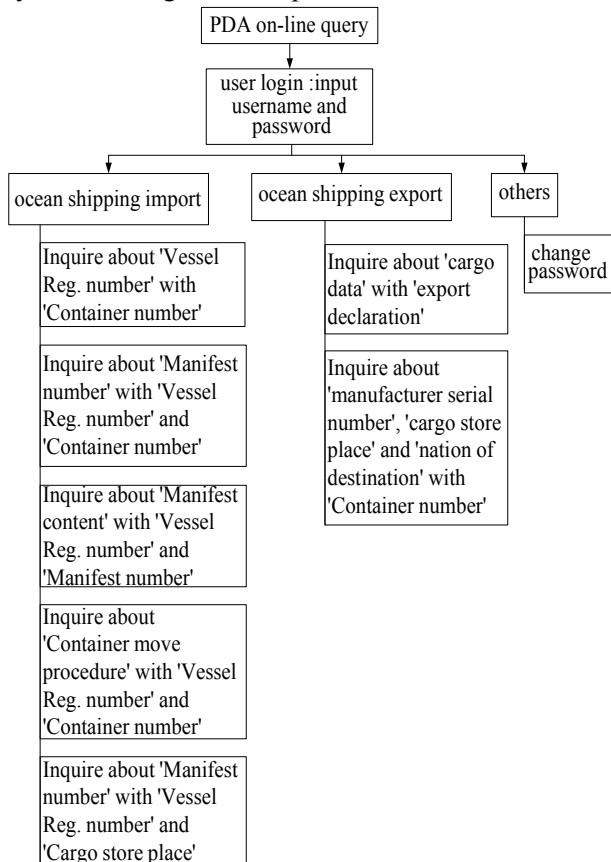


Fig.3 The content and function of the system

5.1 Ocean shipping import

5.1.1 Inquire about 'Vessel Reg. number' with 'Container number'

Customs officer input 'Container number', then show 'Vessel REG.', 'VOY No', 'arrive date' and 'shipping company'.

Container NO.

Container NO.

Vessel REG.	VOY NO.	arrive date	shipping company

5.1.2 Inquire about 'Manifest number' with 'Vessel Reg. number' and 'Container number'

Customs officer input 'Vessel Reg. number' and 'Container number', then show 'Manifest number'.

Vessel Reg. NO.

Container NO.

Vessel Reg. NO.
Container NO.

Manifest NO.	Manifest NO.

5.1.3 Inquire about 'Manifest content' with 'Vessel Reg. number' and 'Manifest number'

Customs officer input 'Vessel Reg. number', 'Manifest number', then show 'Cargo store place', 'Number', 'Gross Weight', 'Description of goods', 'Consignee's' and 'Import declaration number'.

Vessel Reg. NO.

Manifest NO.

Vessel Reg. NO.

Manifest NO.

Number	Gross Weight	Cargo store place
Description of goods		
Consignee's		
<u>Import declaration NO.</u>		

Click 'Import declaration number' then show 'Customs clearance procedure' promptly.

declaration		examine type
shipping company		
procedure		
NO	process date	procedure
1		
2		
3		
4		
5		

5.1.4 Inquire about 'Container move procedure' with 'Vessel Reg. number' and 'Container number'

Customs officer input 'Vessel Reg. number' and 'Container number', then show 'Container move procedure'.

Vessel Reg. NO.

Container NO.

Vessel Reg. NO.

Container NO.

date	time	move procedure	move procedure description	seal

5.1.5 Inquire about 'Manifest number' with 'Vessel Reg. number' and 'Cargo store place'

Customs officer input 'Vessel Reg. number' and 'Cargo store place', then show 'Manifest number'.

Vessel Reg. NO.

Cargo store place

Vessel Reg. NO.

Cargo store place

Manifest NO.	Manifest NO.

Click 'Manifest number' then show 'Cargo store place', 'Number', 'Gross Weight', 'description of goods', 'Consignee's' and 'Import declaration number' promptly.

Vessel Reg. NO.

Manifest NO.

Number	Gross Weight	Cargo store place
Description of goods		
Consignee's		
<u>Import declaration NO.</u>		

Click 'Import declaration number' then show 'Customs clearance procedure' promptly.

declaration		examine type
shipping company		
procedure		
NO	process date	procedure
1		
2		
3		
4		
5		

5.2 Ocean shipping export

5.2.1 Inquire about ‘cargo data’ with ‘export declaration’

Customs officer input ‘export declaration’, then show ‘customs broker box’, ‘manufacturer serial number’, ‘cargo store place’, ‘Gross Weight’, ‘Number’, ‘container number’, ‘description of goods’ and ‘Customs clearance procedure’.

Export declaration NO.

Export declaration NO.

customs broker box	manufacturer serial number
store place	nation of destination
number	Gross Weight

Export declaration NO.

	description of goods
1	
2	

declaration	examine type	
shipping company		
procedure		
NO	process date	procedure
1		
2		
3		
4		
5		

5.2.2 Inquire about ‘manufacturer serial number’, ‘cargo store place’ and ‘nation of destination’ with ‘Container number’

Customs officer input ‘Container number’, then show ‘manufacturer serial number’, ‘cargo store place’ and ‘nation of destination’.

Container NO.

Container NO.

export declaration	manufacturer serial number	store place	nation of destination

6 Implement the effect and conclusion

6.1 Implement the effect of PDA on-line query system

PDA online query system is developed using the Evolutionary Development Model. Document analysis, observation, interview, and discussion are used to discover users’ demands. The query system includes ocean shipping export and import, and other operating procedures that are designed according to the demands for inspection. For example, it can be queried with the container number, the name of the cargo, the registered ship, the cargo storage, the cargo Customs clearance procedure, and the Customs clearance procedure, etc. to enhance the efficiency and performance of anti-smuggling operation.

After half year of the trial period, the online query staff thought positively that the system can control the inspection information, and one of its advantages is maneuverability, compared with the traditional inspection. The traditional inspection needs an office or a place with network to search for suspicious information and print it out to the dock to do inspection on the spot. If the related information cannot be obtained in time when there is a suspicious situation, the opportunity for inspection could be lost. Furthermore, cargo Customs clearance has maneuverability that the procedure has been changed in a short time from the office to the dock. Therefore, the traditional inspection procedure is out of date now. If a PDA online query system is used for inspection, the above disadvantages of the traditional inspection will be avoided to control the procedure of cargo Customs clearance anytime.

6.2 Mobile learning of PDA on-line query system

Mobile learning is a future learning style with wireless network without limitation of space and time. It establishes a learning environment with proper teaching and work models to make learners obtain many advantages, such as knowledge, work support, Internet resources, and interpersonal relationship, etc. In the initial stages after the PDA online query system was build, there were trainings for the staff and they found it is convenient to operate and have active learning in the training process. It is simple and an auxiliary tool for work.

6.3 Conclusion

As the coming of economic globalization causes the increase of the business of Customs import and export clearance, the automation of Customs clearance is government's aim to advance the competitiveness of industry. This study aims at developing a PDA online query system to enhance the service and make the staff be able to query the dynamic information and the inspection work will be more active. The developing process emphasizes user friendliness to explore real demand and technology support, and think of the possibility of problem solving. The result shows that the PDA online query system makes the inspection work maneuverable and very efficient.

References:

- [1] Ellis, K., Moving into m-learning, *Training*, 2003, 40(10), pp.12-15.
- [2] Gary B. Shelly, Thomas J. Cashman, Harry J. Rosenblatt, *Systems Analysis and Design*, USA, Course Technology, 1998
- [3] Green, K.C., *Technology and instruction: compelling, competing, and complementary visions for the instructional role of technology in higher education*, 2000, Available from <http://www.campuscomputing.net>
- [4] Kossen, J S., *When e-learning becomes m-learning*, E-learning 2001(6), Mobile e-learning Section. PalmPower Enterprise Edition. (<http://www.palmpowerenterprise.com/issues/issues200106/elearning001.html>)
- [5] Quinn, C., *mLearning: Mobile, Wireless, In-Your-Pocket Learning*, 2001, LiNE Zine, Fall 2002. (<http://www.linezine.com/2.1/features/cqmmwiy>

- ([p.htm](#))
- [6] Tom H Brown, *The role of m-learning in the future of e-learning in Africa*, 2003, Presentation at the 21st ICDE World Conference, June 2003, Hong Kong.
- [7] Trifonova, A. , Ronchetti, M., *A general architecture for m-learning*, 2003. (<http://eprints.biblio.unitn.it/archive/00000493>)