e-Punch Card: A Solution for Human Resource Issues

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ABSTRACT

Attendance is one of the most important data that will be tracked and monitored by an organisation. The data will show part of the activities and the availability of the staff in the office. In Malaysia, there are a lot of methods being applied to fulfill that purpose. Some of the methods are attendance sheet, attendance book, punch card system and others. This paper will concentrate on the usage of punch card system in Universiti Teknologi MARA (UiTM) Pahang. The issues discussed are related to the advantages, disadvantages and management of the punch card system. This paper will also identify the current issues and problems on the usage of the punch card system in the context of the staff and the management. Findings from the research show that the management should implement a new system for improvement and implementing an e-Punch Card System is an ultimate solution to resolve the issue. Furthermore, this paper will detail out the advantages of the solution and preparation on the organisation on accepting the solution. The solution for the improvement will give positive impact to the management especially toward becoming a world class university.

Keywords: *Advantages, attendance, data, disadvantages, e-Punch Card System, organization*

Introduction

In today's new economy where organisations face tremendous pressure to deliver and maintain an excellent level of service with the minimum level of cost, efficiency and productivity have inevitably become some of the key performance indicators for every organisation to remain in the forefront. Human cost is one of the largest contributors in an organisation's operating expense. By leveraging on information technology, e-Punch Card solutions will empower organisations to monitor and control every major aspect of this expensive resource. It will also enable organisations to reduce the costs of unwarranted overtime, buddy-punching and unauthorised entry.

What is an e-Punch Card System?

An e-Punch Card System is a web-based system that will do attendance management for Universiti Teknologi MARA (UiTM) Pahang. The e-Punch Card System consists of the web-based system itself, a biometric finger device for authentication process and reporting tools for organization usage. A web-based system is an application that can be accessed through the web by using web browsers such as Internet Explorer and Netscape. There are advantages on choosing a web-based system as a platform for the e-Punch Card System. The advantages of a web-based system are (Shelly 2003):

i. easily scalable and can run on multiple hardware environments,
ii. treats the software application as a service that is less dependent on desktop computing power and resources,
iii. easily accessed and in the context of implementing in UiTM Pahang, any authorised department can access the system,
iv. easily maintained whereby any updating process of the system only needs to be done at the server site without involving updating at the user site.

Together with the system, a biometric finger device is used for authentication process. Staff will use this hardware to register in for work and register out after work. The process of the e-Punch Card System is shown in Figure 1. Biometrics is an automated method of recognising a person based on a physiological or behavioural characteristic. Biometric technologies are becoming the foundation of an extensive array of highly secured identification and personal verification solutions (NIST 2003).

Biometrics is expected to be incorporated in solutions to provide for Homeland Security in the United States

including applications for improving airport security, strengthening our national borders, in travel documents, visas and in preventing ID theft. Now, more than ever, there is a wide range of interest in biometrics across federal, state, and local governments. Congressional offices and a large number of organisations involved in many markets are addressing the important role that biometrics will play in identifying and verifying the identity of individuals and protecting national assets (NIST 2003).

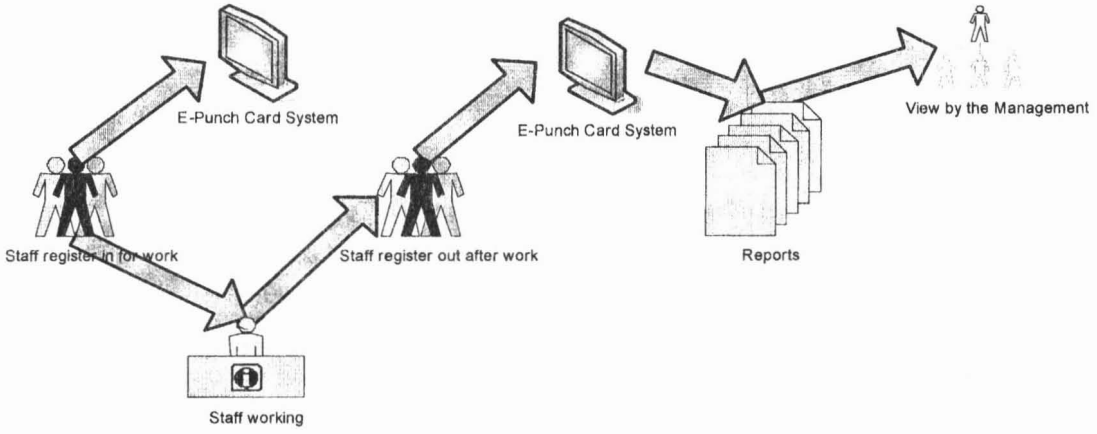

Fig. 1: e-Punch Card System Process

There are many needs for biometrics beyond the Homeland Security. Enterprise-wide network security infrastructures, secure electronic banking, investing and other financial transactions, retail sales, law enforcement, and health and social services are already benefiting from these technologies. A range of new applications can been found in such diverse environments as amusement parks, banks, credit unions, and other financial organisations, enterprise and government networks, passport programs and driver licenses, colleges, physical access to multiple facilities (e.g. nightclubs) and school lunch programs (NIST 2003).

Biometric-based authentication applications include workstation, network, and domain access, single sign-on, application logon, data protection, remote access to resources, transaction security and web security. Trust in these electronic transactions is essential to the healthy growth of the global economy. Utilised alone or integrated with other technologies such as smart cards, encryption keys and digital signatures, biometrics is set to pervade nearly all aspects of the economy and our daily lives. Utilising biometrics for personal authentication is becoming convenient and considerably more accurate than current methods (such as the utilization of passwords or PINs). This is because biometrics links the event to a particular individual (a password or token may be used by someone other than the authorised user), is convenient (nothing to carry or remember), accurate (it provides for positive authentication), can provide an audit trail and is becoming socially acceptable and inexpensive (NIST 2003).

In this case, biometric fingerprint will be used for the recognition process. The actual process being done by the hardware to recognise the person is called 'Fingerprint Recognition'. 'Fingerprint Recognition' is Visual Biometric and it uses the ridges and valleys (minutiae) found on the surface tips of a human finger to identify an individual (NIST 2003).

The third component being applied with the e-Punch Card System is reporting tools. In any information system, reporting tools are important because all data retrieved by the system will be used back as information, where this information is very useful and expensive to the organisation. Reporting tools that are included in the system will allow any department at UiTM Pahang to view information from the system. There are two types of reporting that can be accessed in the system:

i. fix reports,
ii. adhoc reports.

Fix reports are reports that are identified by the users. Rules, type of information, format and calculation are based on user requirement. This report will be included and remain in the system. Most of the reports are critical reports and very useful to the organisation. Adhoc reports are report that can be generated by the users based on their current requirement. The users can choose the type of information that they want to appear in the report. Both types of reports can be viewed through the screen and can be printed if needed.

The three components being used to develop the e-Punch Card System have been explained earlier. Now, let us take a look at the detailed design of the e-Punch Card System itself. The process of the e-Punch Card System is shown in Figure 1, where the basic idea is to replace the current punch card system for staff attendance management.

The main processes still remain where staff members still need to register in for work and register out after work. The difference is the data is no more on the punch card but will be stored directly in the database. This data is very useful and a lot of information can be generated for management use. The important data that need to be in the system is the staff details. This can be explained by referring to the data flow diagram in Figure 2.

The diagram in Figure 2 shows the movement of the data in the e-Punch Card System. The main purpose of this diagram is to identify entities that provide data to the e-Punch Card System and entities that receive information from the system. Data that move into the e-Punch Card System will be processed to become information and will be viewed by required entities. Figure 2 shows that there are two entities providing data for the e-Punch Card System; Staff and Administrator. Figure 2 also shows that all entities will view the information produced by the e-Punch Card System. In addition to that, the Management at UiTM Pahang will also be using the e-Punch Card System to view information that it requires. The Management will include departments such as Hal Ehwal Akademik (HEA), Hal Ehwal Pelajar (HEP), Bursary, Administration and etc.

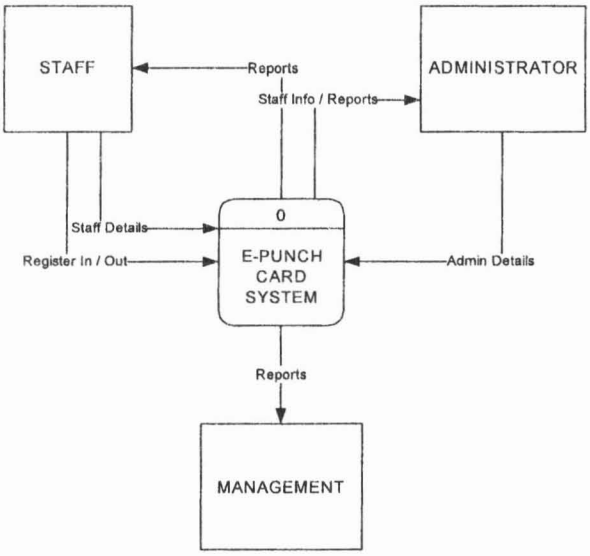

Fig. 2: e-Punch Card System Data Flow Diagram (Context Diagram)

Originally, the study has identified the users of the e-Punch Card System as HEA and the administration department but with the features and flexibility that exist in the e-Punch Card System, the number of users can be more than two departments. This means that if other departments have a requirement to access the system, they can do this by getting the authorisation to access the system. The design of the e-Punch Card System itself shows that the system has capability and enough information for other department to use it. For instance, the Bursary Department can retrieve information from the system to calculate overtime of the staff. Next, let us discuss administration department issues relating to staff attendance.

Administration Current Process and Issues (Attendance)

The process and issues that will be discussed here only concentrate on staff attendance. This discussion needs to be done to prove that implementing the e-Punch Card System is one good solution. Observation has been done to identify the attendance management process and issues that are related to it. UiTM Pahang is currently implementing the conventional punch card system for staff attendance management. This method needs two basic items - punch cards and punch card machines. First, let us look into the process of the Punch Card System. Having a Punch Card System means each staff must be assigned with a punch card. UiTM Pahang (Jengka Campus) has seven departments and eight units. Each of the departments and some of the units need to prepare the punch card for each of the staff under the units or departments. The punch cards need to be collected and replaced at every end of the month. Each department/unit responsible for the punch card also needs to prepare reports at the end of the month. The report provides the information about the staff attendance for the particular month and this report needs to be submitted to the administration department for consolidation. The process is shown in Figure 3. The figure shows that the administration will send related information about attendance such as warning letters to the staff if necessary.

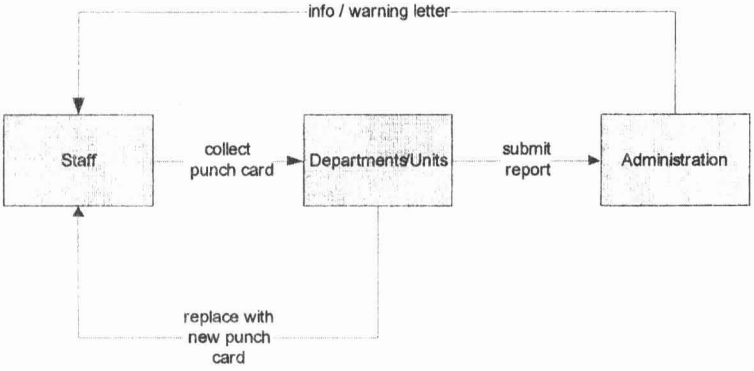

Fig. 3: Punch Card System Process

The conventional Punch Card System process has several disadvantages. From observation and past studies, it is found that there are three major problems associated with the current punch card system. These problems are (Biometrics 2005):

i. buddy clocking,
ii. duplication process,
iii. manual labour.

Buddy clocking is a serious issue in most organisations implementing the punch card system. There are many measures being taken to solve this kind of issue. Warning has also been issued to deter staff from getting involved in buddy clocking. Unfortunately, this kind of activity still happens. Buddy clocking is actually a moral issue and it might have a serious negative impact on the organisation. The quality, productivity and image of the organisation will be affected.

The second downside to the conventional punch card system is duplication process. Figure 3 shows that each department/unit needs to collect the punch cards, replace them with new punch cards and prepare reports for the administration department. Each department/unit needs to assign one staff to handle those activities. UiTM Pahang (Jengka Campus) consists of seven departments and eight units and this means that fifteen employees have to be assigned to be responsible for the same activity. This situation is known as duplication process and an organisation actually wastes the usage of staff.

The third problem is manual labour. A punch card system process needs to be done manually. Staff responsible for those activities need to write or print staff information on the punch card, collect and replace the punch card, prepare the report, consolidate the attendance by checking one by one and lastly submit the report to the administration. At the administration, again, they need to consolidate all reports that they receive to retrieve information that they need. In a manual process, a lot of mistakes can happen. Errors that normally occur are such as typing error on staff information, lost of punch cards, consolidation mistake, mistake in preparing reports and others.

Besides the issues mentioned above, the process on consolidating staff attendance information and preparing the report may take some time because all the process needs to be done manually. Consolidation of the data itself can exceed a period of two months. This situation is not practical for a world-class university. Information is important to support the organisation. Information also will guide the organisation to success. This information that will be used is supposed to be the latest, accurate and can be generated immediately.

Benefits of Implementing the e-Punch Card System

The benefits highlighted here are related to the problems of using the conventional punch card system. As mentioned earlier, there are three major problems that might occur and the e-Punch Card System is a solution to solve those three problems. The e-Punch Card System eliminates buddy clocking as it uses a biometric fingerprint device for the registering process. Each staff needs to put their finger on the biometric fingerprint device to register in or out of work. Hence, the issue of buddy clocking in capturing daily staff attendance is solved.

Duplication processes and the use of manual labour will no longer be major issues because all the processes are taken care of by the system. Probably, only two or three staff will be needed in terms of maintaining the system. The benefits actually can be divided into:

i. service improvement,
ii. better performance,
iii. more information,
iv. stronger controls,
v. cost reduction.

The e-Punch Card System is totally systematic and there is no more manual process. Consolidating staff attendance information is being done automatically by the system. All the data that move into the system can be processed immediately and the result can be viewed without waiting for several months. Punch cards no longer need to be collected and replaced by the responsible staff. Hence, it also reduces labour mistake and any information related can be viewed through the system and the reports can be produced immediately either in softcopy or hardcopy. Anybody can view the information in the system as long as they are authorised to use the system.

The e-Punch Card System gives better performance compared to the conventional punch card system. Consolidating staff attendance information can be done immediately. In addition, accurate information can be generated and can be viewed immediately. The e-Punch Card System is installed and maintained in one centralised server where the client can have direct access. Maintenance can be done easily. Hence, changes and modification will also be done on the server. Once the process finish all client will get the same up-to-date information. This is because the e-Punch Card System uses the Client-Server concept. This concept can be illustrated in Figure 4:

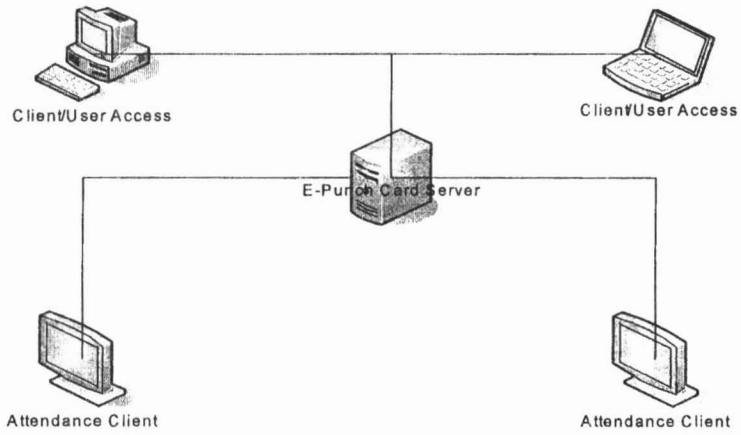

Fig. 4: e-Punch Card System Client-Server Concept

A lot of information also can be retrieved from the e-Punch Card System. The punch card system only prepares daily staff attendance information, but with the e-Punch Card System, more information based on user requirement can be produced. For instance, this system can do attendance statistics for analysis, view staff information by groups of staff, based on specific date or duration of date, based on specific time or duration of time and a lot more.

The e-Punch Card System also has stronger controls especially on the system access portion. Only authorised persons can access the system. High security effort is being controlled on the system. It eliminates buddy clocking as biometric fingerprint devices are being implemented. Users that need access must get an authorised identification from the system administrator. The system also can restrict the level of access that is assigned to the various users.

The last benefit discussed here is reduced cost. Implementing the e-Punch Card System reduces a lot of cost, not only on budget but also in reducing time. The punch card is not used anymore, information can be generated immediately, and no more wasting on staff usage and any decision relating to staff can be decided faster and easier.

Management Preparation on Implementing the e-Punch Card System

Changing the old process or tools to new implementation is not an easy process. Normally, in any organisation, if employees are willing to change, the management needs to give full support to the responsible team. Without support from the management nothing can be done. The e-Punch Card System is a good solution but in order to make it a reality there are few issues that need to be addressed by the management. There are four issues that the management needs to prepare and be aware of. The issues are:

i. management cooperation and support,
ii. preparation on the hardware, software and resources,
iii. staff preparation,
iv. preparation on policies and rules.

Management cooperation and support is vital for the successful development and implementation of the e-Punch Card System. Without cooperation and support from the management the three others issues that require full attention from the management cannot be solved. This is the major preparation that needs to be done by the management. Project accomplishment really depends on this. Support from management shows to the organisation that the management is really serious with the improvement and that it provides full support to ensure the successful implementation of the system.

A system development project needs to have resources to proceed. Resources are being identified by the project manager and will be approved by the management. In this situation, the management needs to play the important role understanding the need of each resource for the development and implementation of the system. The management needs to prepare the budget for that purpose.

Besides the two issues discussed, the existence of the project must be announced to the employees. They need to be aware that there will be changes and improvement that will happen in the organisation. Once they are aware and acknowledge the project, then at least they have time to prepare themselves in accepting new rules in their daily work. This is important because not all employees can accept changes especially when they are already familiar and comfortable with the old system.

Another important preparation that needs to be made is the rules and policies. The management needs to review current policies and rules to make sure that these are compatible or inline with the new system. This is also critical because if the policies and rules are not clear and not supporting the new system, it will become difficult for employees to apply and use the new system.

Conclusion

The paper provides an overview of the e-Punch Card and the functionality of the system. It has highlighted how the e-Punch Card System works, the entities related to the system, the benefits of the system, and preparation of the management in implementing the system. From the study, the researchers have identified a lot of improvement that can be made on the organisation's attendance management process. The implementation of this system also shows that it can reduce a lot of tedious work currently being done by each department or unit. The important asset here is the information. Accurate information can be retrieved from the system and it can be retrieved immediately. The information can also be used many times because all data are being stored in the database.

This paper is the start of the researchers' idea on this issue. A lot of other things need to be done for the successful implementation of this project and the researchers will proceed until at least the prototype of the system can be developed. Even though there is a lot of this kind of technology in the market they are actually too expensive. Besides, the features of those systems also do not really meet our requirements and conditions. With this research it is hoped that the development and implementation of e-Punch Card System will soon be a reality at UiTM Pahang.

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