

Electronic Signature at Electronic Document Management Systems

Ali Evren Göksungur*

* Department Of Computer Engineering, Faculty of Engineering and Architecture, Nişantaşı University, 34406, Istanbul, Turkey

(alievren.goksungur@nisantasi.edu.tr)

Received: 22.09.2017 Accepted:27.12.2017

Abstract- This manuscript is about electronic signature and its usage methods at electronic document management systems (EDMS). EMDS is the most efficient way to manage that documents in electronic format. EMDS helps to receive documents, transfer, store and send them. Electronic signature is data that is logically associated with another data and which is used by the signatory to sign. Electronic signature has same legal standing with handwritten signature as long as it follows the rules that it was created under. Electronic signature and EMDS works side by side to securely store documents and create a trustworthy document management system.

Keywords- e-signature, document management, electronic data.

1. Introduction

Today most of the documents are created at the digital platforms. Digital documents created at electronic platforms and send, receive, keep at these platforms. High efficiency, easy usage and data transfer, minimum physical space requirements are the advantages of electronic documents. There is a waste amount of digital document traffic in a system. Managing these documents, storing them under specific rules makes these systems useful. To improve the management that amount of document efficiently EDMS (Electronic Document Management Systems) applies technological methods to these documents[1]. With improvements at the file related technologies such as file read-write and store technologies, electronic document management systems are also improved [2]. With these improvements electronic document management systems are became one of the most important part of the most systems. E-government systems also highly dependent to EDMS (Electronic Document Management Systems) because of their need of organization at the high amount of documents [3]. Documents that created at EDMS needs to be signed by authorized people. Without electronic signature these documents needs to be printed and signed with handwrite. These process is against the purpose of EDMS system that keeps documents at electronic platform. Electronic signature has the same legal validity with the handwritten signature and the signer can be recognized from anyone

with e-signature reading softwares from anywhere. E-signature completes the EDMS with signing documents at the electronic platform. E-signatures most important quality is undeniability [4]. E-signature and EDMS are used at many areas that highly dependent to documents. One of them is healthcare industry, which has waste amount of document that needs to be organized, stored and signed securely [5]. The healthcare industry starts to transforms to e-healthcare which is transferring information with internet to related stakeholders and uses e-signature for signing and securing information [6]. E-signature is also important part of security of e-commerce systems and there are some researches to improve security of e-signature[7]. E-signature is base for digital citizen that will help government and other organizations to detect persons securely and efficiently at the digital world. There are some researches to create e-identity that is improved version of e-signature. [8] One of the most important advantages of e-signature is decrease cost and improve security at the electronic transactions. At 30 June 2000 a US law grants e-signature to legal validity equal to handwritten signature, that shows the important of the e-signature [9]. Also with huge growth of electronic commerce business at the china, government declared a new e-signature law at 2007 to organize and help improve e-commerce which is based on e-signature [10]

2. E-signature Methods

2.1. E-signature at Browser

Electronic document management systems mostly work under browser based systems. These systems contains a server and client application that communicates with network protocols. Users interact with application through internet browsers and interface that client application works in it. E-signature applications needs to read data from e-signature usb dongle.

user can sign documents from browser. When user visits the page which they will sign document , browser downloads the java applet application .Java applet code gets the related document which will be sign and listens the hardware change at usb ports. When user plugins their usb dongle, java applet code detects the dongle and reads the data in it. Java applet code asks user to enter the pass code for e-signature via user interface. After correct password entered, java applet code signs the document with e-signature and sends the document to server for saving. With this signing procedure is complete.

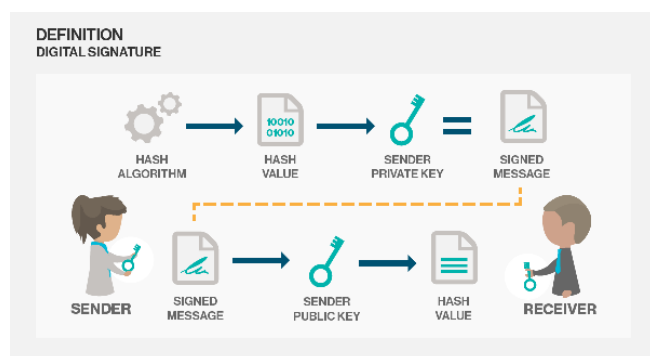


Fig 1. Digital Signature Definition.

Each person have its own unique usb dongle. To read that data client application needs to have ability to access hardware but client applications have access to hardware as long as browser have the same access and allows to application. Most of the browsers don't have access to read data from computer hardware, to solve this problem third party applications are used that runs at browser such as java applets.

2.2. E-signature at Desktop

There are some cases that running java applet at browser is not permitted or not in the best practice scenario. Signing document with java applet is fast and easy way to sign a document which is accessible with browser interface but popular browsers are dropping support for NPAPI plugins which is required to run java applets. Java applets are useful but giving access to browser to reach your hardware, local documents are is a security issue. At solving this problem desktop applications are comes handy in this situation. Down side of desktop application by comparison to java applets that run at browser is every computer needs to install that application to their computer and when every time there is a new version of the application comes out, installation process needs to happen again. On the other side, desktop application has more reliability then java applets and more stable.

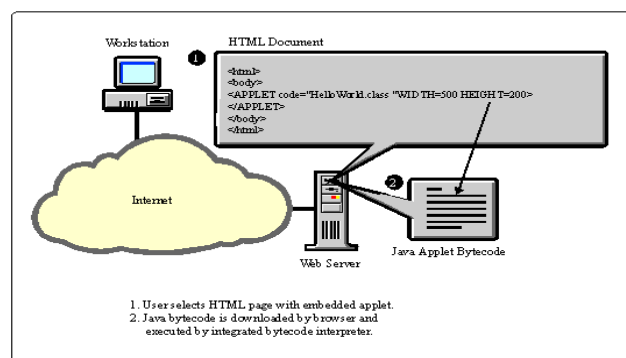


Fig 2. Java Applet workflow.

A Java applet is a small application which is written in Java or another programming language that compiles to Java bytecode and delivered to users in the form of that bytecode. The user launches the Java applet from a web page, and the applet is then executed within a Java Virtual Machine (JVM) in a process separate from the web browser itself. A Java applet can appear in a frame of the web page, a new application window, Sun's AppletViewer, or a stand-alone tool for testing applets. With java applets

When desktop application starts, user signs in with username/password or e-signature options. After authorization is complete, application gets data from server and shows user to documents that are waiting to sign. User select document and application waits user to insert its usb dongle to usb port. When user inserts the dongle to usb port application reads the data from usb and shows the user to its data and user interface to enter password. After user successfully inserts the password application code signs the document with e-signature and creates the e-signed document and sends the document to server. Desktop application also validate e-signed documents and read the data in it which contains who is signed this document and when it signed if there is a time stamp in it. Time stamp is included in the signing process and improves the validity of the e-signature.

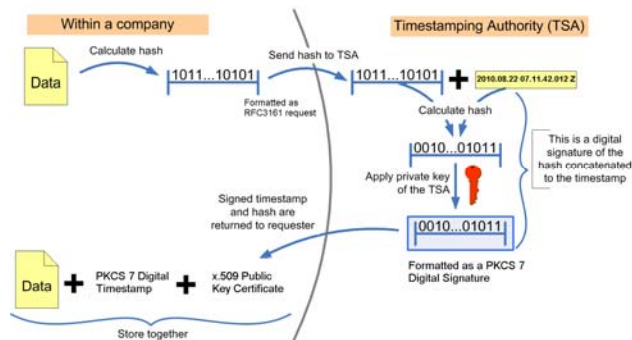


Fig 3. E-signature timestamp.

3. Conclusion

The electronic document management systems are perfect tools to manage and organize electronic document and electronic signature is the most important part of this systems to be complete. Creating document at electronic platform is not just easy also it is safe , secure and fast . Signing these documents with e-signature that has undeniability secures the document and helps the digitally created document to stay at digital platform. Validating e-signature is also highly easier than handwritten signature and it is more secure then it.

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