

Chapter 17

A Smart Card Based Software System for Surgery Specialties

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ABSTRACT

This chapter presents a software system based on smart cards technology for recording, monitoring and studying patients of any surgery specialty (General Surgery, Orthopedics, Neurosurgery, etc.). The system is also suitable for the computerization of any surgery specialty clinic and the respective surgical material repositories. Dynamic customization functions adapt the system to the different characteristics of the surgery specialties. Special customization is involved concerning implantable materials. The .NET platform and Java Cards used for the development of the system and the architectural model of the system are designed towards satisfying the basic integration and interoperability issues. The developed system is “doctor-friendly” because it is based on classifications and knowledge grouping used in every day clinical practice provided from medical experts on the field but is not intended to be a complete Electronic Medical Record (EMR). The major scope of this effort is the development of a system that offers a fast and easy installable, low cost solution in health environments still immature in adopting solutions based exclusively on Informatics and is designed to be installed in small Private Medical Consulting Rooms to Community Clinics, Health Centers, Hospital Surgery Departments till Central Health Organizations.

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INTRODUCTION

Software systems are broadly used in healthcare, usually under the terms of Electronic Health Record (EHR), Electronic Patient Record (EPR) or Electronic Medical Record (EMR). These terms are often used interchangeably, although differences between them can be defined. An EMR is a patient record that mostly contains clinical data, is created in Hospitals and can be used as a source for the EHR (Habib, 2010), (Kierkegaard, 2011). An EHR is a superset of the EMR containing administrative, financial and clinical data, offering facilities to patients, physicians and other health care providers, employers and payers or insurers.

Smart cards are used in many fields as a reliable and proven solution for that are now making their mark on healthcare. A portable mini-computer that can be programmed for specific services is a basic description of a smart card. In order healthcare to become a more digital area, smart cards technology is embraced. Smart cards are generally used for authentication and access purposes as well as data repositories.

Their added values, more analytically, are: (Grogan, 2007)

1. Fast access to accurate information.
2. Acting as a portable data repository.
3. Speeding manual processes such as hospital admissions.
4. Reducing fraud.
5. Streamlining administrative procedures.
6. Decreasing expenses from patient verification to insurance confirmation.
7. Facilitation of electronic claims submissions.
8. Acting as a payment source.
9. Linking disparate data sources in a secure fashion.

This paper presents a smart card based Software System for Surgery Specialties (SCS⁴) suitable for any surgery specialty patient (General Surgery, Orthopedics, Neurosurgery, etc) and any surgery department. Minor medical history and health information are not recorded therefore SCS⁴ is not intended to be a complete Electronic Medical Record (EMR). SCS⁴ is designed to offer a fast and easy installable, low cost solution in health environments still immature in adopting solutions based exclusively on informatics, as a first step towards controlling and computerizing major issues of a health system. SCS⁴ is designed to be installed in Small Private Medical Consulting Rooms, Community Clinics and Health Centers to Hospital Surgery Departments, Private Surgery Clinics, till Central Health Organizations like the Ministry of Health and Country Region Health Offices. "Doctor friendliness" and adaptability to all surgery specialties, are major benefits of the system. SCS⁴ is installed in a pilot mode in two Orthopedics Clinics in two different Hospitals and a third installation on a General Hospital Orthopedic Clinic is pending.

The remainder of the paper is organized as follows. In section 2, we introduce related work concerning smart cards usage in healthcare. Section 3 describes the proposed system and reveals his advantages and disadvantages comparing the functionality of the national health system as it works nowadays with the functionality of the national health system if it is based on scs⁴. In section 4, the case studies in two general hospitals are presented. In section 5, we discuss the results and finally in section 6 the conclusions are presented.

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