



# **Assessment of Electronic Medical Record Applications: An Overview for Powerful EMR Estimation**

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**ABSTRACT:** An EMR system implementation would significantly reduce clinician workload and medical errors while saving the healthcare system major expense. This article examines EMR system efforts, benefits, and barriers, as well as steps needed to move closer to a nationwide EMR system.

This study aimed to address the needs of clinicians from resource-limited settings without reliable internet access who are considering adopting an open-source EMR.

**KEYWORDS:** EHealth, OpenMRS, Egidio, GHIS, isante, OSCAR, worldVista.

## **I. INTRODUCTION**

Information technology has revolutionized virtually every facet of our lives and it has been changed drastically over the past two decades, particularly in healthcare system. Changes in the healthcare environment produced fundamental shifts in the delivery of healthcare, primary care over specialty care and guidelines-driven care over autonomous decision making.

As a consequence, this factor contributes to the usage of some form of information technology in many countries, predominantly in terms of individual Health Information System (HIS), electronic medical record (EMR). The implementation of HIS varies between one country to another for example in Pacific Region, where it will be driven by factors of an increased expectation from patients and demands from clinicians and changes in disease patterns, from communicable to non-communicable including chronic diseases that requires changes in patterns of care and supporting system [1].

The terminology for EMR is evolving, beginning with the term “computer stored medical records” followed by computerized patient record (CPR), computerized medical record (CMR), computer-based patient record system (CBPR), electronic health record (EHR), and automated medical record (AMR) [2].” Some researchers had agreed to refer EMR as a patient medical record from various sources related to patient treatment, diagnosis, lab test, history, prescription and allergies that can be accessed from various sites within the organization with the protection of security, patient privacy and confidentiality. EMR is available to all healthcare providers delivering care to a patient.

The Electronic Medical Record System (EMR) is one of the important components in Hospital Information System [3]. Many people used the terms electronic medical record and electronic health record interchangeably. However, EMR and EHR are two different concepts; EMR is the hospital and ambulatory legal record of source of data for EHR, whereby EHR represents ability to easily share medical information among stakeholders [4].

In short, researchers refer EMR as a patient medical record from various sources related to patient treatment, diagnosis, lab test, history, prescription and allergies that can be accessed from various sites within the organization with the protection of security, patient privacy and confidentiality.

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## II. DISCUSSION

An EMR system implementation would significantly reduce clinician workload and medical errors while saving the healthcare system major expense. This article examines EMR system efforts, benefits, and barriers, as well as steps needed to move closer to a nationwide EMR system. The analysis includes a blueprint for implementation of EMR, industry comparisons to highlight the differences between successful and non-successful EMR ventures, references to costs and benefit information, and identification of root causes. Implementation will require upfront costs including patient privacy that must be addressed early in the development process.

### 1. Open Source

Recognizing that most of the EMRs use a combination of propriety an non-propriety components e aimed to include only products that are open source as the barrier of standards compatibility and system interoperability is lessened by open source software's [5].

EMR SYSTEMS →	OPEN MRS	EGIDIO	GHIS	iSANTE	WORLD VISTA	OSCAR
<b>Design for what purpose</b>	Primary Care	HIV/AIDS	HIV/AIDS & primary care	HIV/AIDS	Primary Care	Primary Care
<b>Languages</b>	English, Spanish	English, French, Portuguese, Italian	English	English, French	English	English, French, Spanish
<b>Auto Generated Patient ID</b>	✓	✓	✓	✓	✓	✓
<b>Editable Past Medical History</b>	✗	✗	✓	✓	✓	✓
<b>Pharmacy Inventory</b>	✗	✓	✓	✗	✓	✗
<b>Prescription Printing</b>	✗	✗	✓	✗	✓	✓
<b>Able to Search/Retrieve information on various criteria</b>	✓	✗	✓	✓	✓	✓
<b>Report</b>	✓	✓	✓	✓	✓	✓
<b>Operating System Compatible with EMR Server</b>	Linux	Windows	Not Available	Linux, Unix, windows	Not Available	Linux, Unix, Windows, OSX and Solaris
<b>Web servers</b>	Apache, GlassFish	Not Applicable	Not Available	Apache, IIS	Not Available	Apache
<b>Database System</b>	MySQL	MS SQL Server	Not Available	MySQL MS SQL Server	Not Available	MYSQL, ORACLE
<b>Other s/w require for the EMR system functioning</b>	Java 1.6+, JDK 5.3+, PHP	Not Required	Not Available	Java, Perl, LDAP, Cygin(windows only), Jasper Report	Not Available	Java



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<b>System Architecture</b>	Web based, Service Oriented architecture	Open Source	Client/Server	Web Based	Web Base and Client/Server	Web Base and Client/Server
<b>Development Environment Used</b>	Eclipse	Visual Studio	Visual Studio	Not Available	Not Available	Eclipse
<b>Type of License</b>	Open Source	Proprietary	Proprietary	Open Source	Open Source	Open Source
<b>HIPAA Compliance Community</b>	✓	✗	✗	✓	✓	✗

**Table 1: Comparative Result of the Different Open Source Software's**

## 2. Software's we Converse

### A. OPENMRS

OpenMRS uses web-based architecture but does not require internet access. Hardware requirements are minimal. Software platforms and software tools are all open source, and it has an active support community

### B. Dreame Sant Egidio

DreameSant Egidio (SE) [6] relies on Microsoft Windows, MS SQL Server and MS Access. The system provides HIV related health maintenance reminders.

### C. GHIS

GHIS is an open-source clientserver application which runs on MS Windows and MS SQL Server. GHIS is an English language system for both HIV and primary care.

### D. iSante

iSante' uses web-based architecture but does not require internet access. iSante' is an HIV care system available in French and English.

### E. WorlVista

WorldVista is an open source and primary care system.

### F. OSCAR

OSCAR was developed in Canada for primary care. It uses web base architecture.

A concise summary of the clinical functionalities, the full results of the clinician surveys and the technical implementer surveys n is shown in the Table1.

## III. RESULT

The challenge for clinicians working in resource-limited settings is to find an EMR that will provide basic functionality for primary care practice and provide an interoperable base on which to build for the future. In contrast to the optimism evident in many published articles, we found only six open-source EMRs suitable for use in resource-limited settings with unreliable internet access. The development of open-source EMRs for use in resource-limited settings reflects the long-standing tension in public health between vertical and horizontal programmes.<sup>27</sup> Funding agencies have supported the development of open source EMRs for HIV care, which contain most of the functionalities needed by clinicians to ensure efficient workflow but have not supported systems applicable to primary care. Even in the areas with the highest HIV prevalence, primary care remains the highest priority for both HIV-infected and non-infected individuals.



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Given the importance of the EMRs for the future of medical care, we feel it is imperative that an international body directly test these products to determine their clinical functionalities and limitations. Unfortunately, the long-term goal of having primary care data available for local, national and global use in making public health and quality care comparisons is nowhere in sight. Ultimately, a new Millennium Development Goal should include the creation of a universal open-source health informatics platform that will allow the collection, management and delivery of clinical and population data that will guide decision processes at the local, regional and global levels. Until this goal is achieved, care will continue to consume unnecessary resources because of fragmentation, medical errors and poor data utilization.

## IV. CONCLUSION

In today's healthcare practices, information is both a benefit and a challenge for every provider regardless of the healthcare organization types and sizes.

By introducing information technology into healthcare services, it is believed to provide and assist healthcare personnel to serve the best to the people in terms of healthcare services. EMR has been introduced and shown to eliminate the weaknesses of paper-based medical record. The used of information from EMR provides the opportunity for healthcare organizations to improve quality of care and patient safety.

However, some of technical and non-technical issues also must be resolved before powerful EMR systems can become realities in our healthcare system. These include issues of patient privacy and confidentiality, physician acceptance of closer scrutiny by management, regulatory and medico legal standards for electronic medical records and cost-benefit justification for investments in EMR systems.

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