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### Analysis of Open-Source Electronic Medical Record Software Using WASPAS Method

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#### Abstract

This study is from resource-limited settings like ours it It aims to address the needs of physicians. Through unfrosted internet access Outpatient treatment point Options for adopting an EMR They are investigating, and they have fewer funds and there are human resources. EMR availability, cost, Ease of installation and maintenance, clinical activity and monitoring and our emphasis is on quality improvement reports. Open Source Software (OSS) such as enterprise tools and databases Server operating systems it has gained wide acceptance in many domains. The State of Open Source in Healthcare We review and In North America Around widespread adoption of health IT To address some of these challenges We discuss the potential of open source. MCTM applied Approaches to decision making and fuzzy collections new development are considered approaches. The findings of this study, Trainers and Educators like adopt new MCDM application techniques; they also help provide insight into the literature. Developer 1, Developer 2, Developer 3, Developer 4 and Developer 5. Evaluation parameter is Functionality and Features, Security, Developer support and ease of installation. In this type of analysis, WASPAS methods determine for the best solution to the negative Short distance and very long distance to settlement, but Comparison of these distances doesn't underestimate the importance. As a result, Developer 4 is first rank, and Developer 2 is lowest rank.

**Keywords-** Medical Record System, CEN, MCDM

#### 1. Introduction

EMR database Composed of various Multivariate data sources, derived from EMR database Data are heterogeneous, incomplete and redundant; this greatly affects the final mining result. Therefore, EMR data is accurate, complete and constant and protected privacy EMR data must be preprocessed. IT development And HIS (Hospital Information System), EMR have also been popularized. EMR or EHR, medical staff text, Codes, charts, graphics, data and other digital information Medical records used for registration created, stored, managed, transmitted and efficiently reproduced by HIS. As EMR adoption has grown exponentially, the availability of medical information of various sources (population, history of diagnosis, Medications, lab test results and including vital signs) for large-scale analysis Installed EMR as a treasure. The WASPAS method was proposed and developed is an MCDM method. This method has many decision problems and applied and extended to contexts. For selecting the best construction site for deep sea port one based on the WASPAS system Using COPRAS, TOPSIS and WASPAS methods Day lighting in a renovated local building and MCDM approach to deal with the classical continuity problem. Using WASPAS methods to solve the shopping mall location problem a approach. WASPAS and MOORA methods were studied to verify robustness. WASPAS method for rating the facades of some public and commercial buildings.

#### 2. OS-EMR Software

An OS-EMR system for customization and use of the platform "Open Source Medical Record System (MRS)" To support this large epidemiologic study. The steps involved in developing and modifying an open source MRS for this study, Used the computer for two years we also describe our experience. There were open source electronic health record systems then evaluated against the criteria. In all systems analyzed, Handles accesses control in emergency situations No part of the system. Most EMRs recognizing that they Proprietary and non-proprietary Use a combination of components, Considered Trusted Open Source We aim to include products only. Too among the community of developers and users Development costs are shared, Product if a proprietary software vendor disappears Reduces the threat of disruption. Prescribing safe medications the main function of EMRs is to Also for drug coding Lack of international standards is a challenge. Used by commercial EMRs in the United States There is a National Pharmacopoeia Directory<sup>29</sup>. WHO has developed an International Pharmacopoeia? <sup>30</sup> American systems Use. These EMRs can be used Potential users should proceed with caution, if possible. Preferred language and Install and use the application in a clinical setting communicate directly with others. There are many different OSS licenses. Many are fully functional and functional, suitable for primary care the information the efforts of other pioneers have already developed Society should recognize and appreciate open source EMRs. Open EHR Consortium EHR's open and A detailed specification have been developed. It has been adopted by many countries. European Committee for Standardization, A standard EHR recommended for European countries, CEN has adopted several constructions of EN 13606. Melo and

Carlton18, Use of EMRs in Education, Navigating the EMR and Ability to document their medical care Helped students feel confident. Like other basic skills, Students in this study gain experience about electronic documents EMR should be used repeatedly to generate positive feedback. On average, in this study Students more than 4 times have used an EMR, But with a large SD (1.63), We know there is variation in student EMR use, The results of the study highlight the need for additional training with EMR indicates that the students felt Also, the number of instances in which students use the EMR, Their perceptions of EMR tools are excellent 5 or more than students who used the EMR less than 5 times Students who used it more often had positive feelings. Innovations with high utility they also suggested a strong sense of academic EMR reality. As participants reach a number of applications of 5 or more, security, client requirements and they felt they had learned more about the documents. Lucas6 announced EMR activities 4 weeks prior to students' first clinical experiences.

### 3. WASPAS

WASPAS was relatively innovative and a straightforward MCGDM method, it is in various theories widely expanded. In addition to its simplicity, WASPAS uses the well-known Weighted Sum Model (WSM) and by incorporating. The ranking and Uses a more precise concept. It is widely used in many practical problems. Used WASPAS to assess the work of consultants in the transportation of hazardous materials. WASPAS method was used for plot selection. Based on integration operators under for ranking items in MCGDM problems The UPLTS context method is Uncertain Probabilistic Linguistics Called WASPAS (UPL-WASPAS). Weighted Gross Product Rating (WASPAS) is a new utility theory one of the approaches is called a priori weighted aggregate product estimation (WASPAS). WASPAS methodology helps to evaluate and rank alternatives with high reliability. This approach underlies various fuzzy theories Extended to many decision problems. The value intuition Extended with vague information. WASPAS in an ambiguous environment and of AHP (Analytic Hierarchy Process) provided the combination and Used. Break type-2 In terms of fuzzy set operators. Two new MCDM applications methods with recent fuzzy improvements and provided a systematic review of applications, this includes SWARA and WASPAS and discussed in recent years this includes ambiguous extensions. It has many real-world engineering and Used for management issues. WPM and WSM. To connect WPM to WSM, A mixing parameter should usually be set to 0.5. This combination of models results in a more reliable ranking of MCDM problem solvers. Because of its advantages many studies have been done using this method. The WASPAS system is reluctantly ambiguous, Intuitive Ambiguous, Sphere Ambiguous, Interval Type-2 Ambiguous, and Like Pythagorean fuzzy and single-valued neutrosophic extended to various uncertain and ambiguous contexts. These developments may expand the WASPAS system and it shows that it can be applied to many contexts and problems. In other words, in the present study we chose this method. They analyzed and discussed the WASPAS approach; finally they are they concluded that this approach is more powerful than WSM and WPM. In other methods and which WASPAS method is more accurate they pointed out. In recent years, some studies have addressed the potential of WASPAS method in many fields. In this regard, Begonias et al. (2013) for economic demand in Europe to select a deep water port Based on WASPAS and entropy methods proposed an integrated method. To select a location for the construction of a shopping center Based on fuzzy WASPAS and fuzzy AHP proposed a hybrid model. They concluded that the proposed hybrid model is appropriate specific complex problems. Therefore, based on important citation studies of WASPAS method and its accuracy in multivariate decision problem, in this research For RQA This method was used, In other words, we chose this method in the present study. They analyzed and discussed the WASPAS approach and finally this approach is WSM and concluded that it is more powerful than WPM. Any WASPAS method among other methods they also pointed out that it has high accuracy. In recent years, some studies have addressed the potential of WASPAS method in many fields. In this regard, Bagošius et al. (2013) for economic demand in Europe to select a deep water port Based on WASPAS and entropy methods proposed an integrated method. for site selection for shopping center construction Obscure WASPAS and Based on Fuzzy AHP proposed a hybrid model. They concluded that the proposed hybrid model is appropriate specific complex problems. 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In other words, Performance of the WASPAS method It has been proven in many studies, in the present study We chose this method. They approach the WASPAS Finally this approach is also analyzed and discussed WSM and concluded that it is more powerful than WPM. Any WASPAS method among other methods they also pointed out that it has high accuracy. In recent years, some studies have addressed the potential of the WASPAS method in multiple fields. In this regard, for economic demand in Europe WASPAS and for selecting a deep water port. To select a location for the construction of a shopping center proposed a hybrid model. The proposed hybrid model they decided it was appropriate specific complex problems. Therefore, based on the critical citation studies of Based on WASPAS method and its accuracy in multivariate decision problem, risk quality analysis (RQA) was used in this research.

Table 1: Data set for Open-Source Electronic Medical Record Software

	Functionality and Features	Security	Developer support	Ease of installation
Developer 1	0.492339	0.230037	0.130037	0.17221
Developer 2	0.152617	0.461409	0.752062	0.13960
Developer 3	0.344355	0.44355	0.344355	0.22713
Developer 4	0.517414	0.817414	0.217414	0.12738

Developer 5	0.638603	0.638603	0.638603	0.638603
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This table 1 shows that the value of dataset for Open-Source Electronic Medical Record Software in WASPAS method Alternative is Developer 1, Developer 2, Developer 3, Developer 4 and Developer 5. Evaluation parameter are Functionality and Features, Security, Developer support and Ease of installation

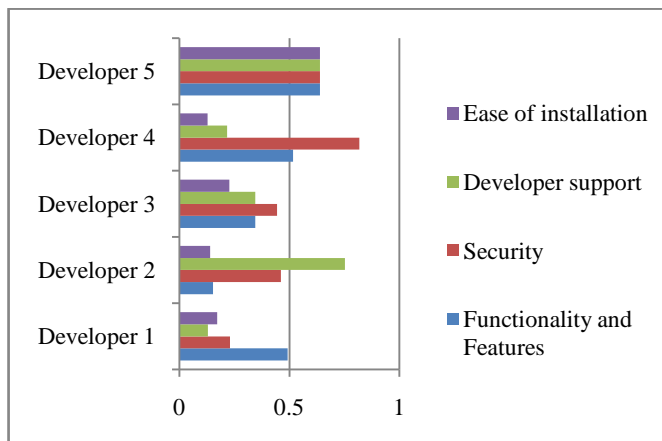


Figure 1: Open-Source Electronic Medical Record Software

Shows that the figure 1 value of dataset for Open-Source Electronic Medical Record Software in WASPAS method Alternative is Developer 1, Developer 2, Developer 3, Developer 4 and Developer 5. Evaluation parameter is Functionality and Features, Security, Developer support and Ease of installation

Table 2: Performance value

	Functionality and Features	Security	Developer support	Ease of installation
Developer 1	0.77096	0.28142	1.00000	0.73967
Developer 2	0.23899	0.56447	0.17291	0.91244
Developer 3	0.53923	0.54263	0.37762	0.56082
Developer 4	0.81023	1.00000	0.59811	1.00000
Developer 5	1.00000	0.78125	0.20363	0.19946

This table 2 shows that the values of Open-Source Electronic Medical Record Software for Performance value using WASPAS. Find the pair wise comparison value for Functionality and Features, Security, Developer support and Ease of installation.

Table 3: Weight

	Functionality and Features	Security	Developer support	Ease of installation
Developer 1	0.25	0.25	0.25	0.25
Developer 2	0.25	0.25	0.25	0.25
Developer 3	0.25	0.25	0.25	0.25
Developer 4	0.25	0.25	0.25	0.25
Developer 5	0.25	0.25	0.25	0.25

Table 3. Open-Source Electronic Medical Record Software weights are same

Table 4: Weighted normalized decision matrix

	Functionality and Features	Security	Developer support	Ease of installation
Developer 1	0.19274	0.07036	0.25000	0.18492
Developer 2	0.05975	0.14112	0.04323	0.22811
Developer 3	0.13481	0.13566	0.09441	0.14021
Developer 4	0.20256	0.25000	0.14953	0.25000
Developer 5	0.25000	0.19531	0.05091	0.04987

This table 4 shows that the values of Open-Source Electronic Medical Record Software in For product recommendation using WASPAS Weighted normalized outcome matrix Developer 1, Developer 2, Developer 3, Developer 4 and Developer 5.

Table 5: Preference score, WASPAS coefficient and Rank

	Preference Score	WASPAS Coefficient	Rank
Developer 1	0.69801	0.66547	2

Developer 2	0.47220	0.42708	5
Developer 3	0.50508	0.50200	3
Developer 4	0.85208	0.84322	1
Developer 5	0.54608	0.48407	4

This table 6 shows that the values of Open-Source Electronic Medical Record Software in Preference Score , WASPAS Coefficient and rank For using WASPAS. Find the pair wise comparison value for Developer 1, Developer 2, Developer 3, Developer 4 and Developer 5.

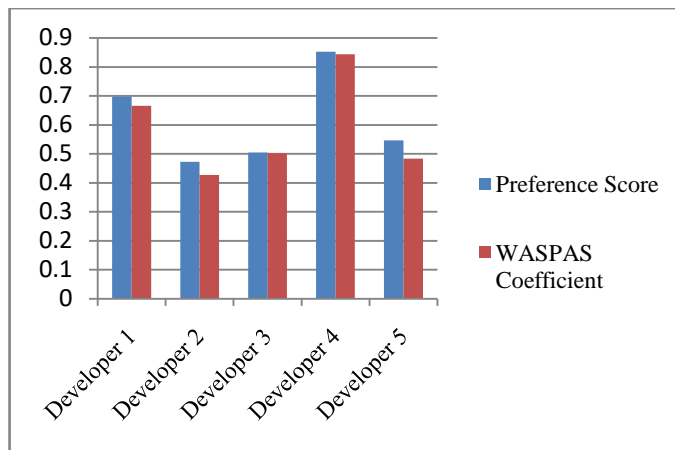


Figure 2: Preference score and WASPAS Coefficient

This figure 2 shows that from the Open-Source Electronic Medical Record Software in Preference Score result it is seen that Developer 4 = 0.85208 and is got the lowest value whereas is the Developer 2 = 0.47220 got is having the first value and WASPAS Coefficient result.

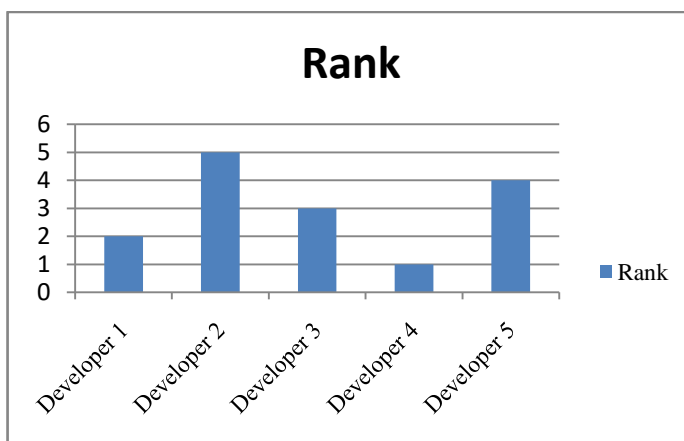


Figure 3: Rank

This figure 4 shows that the Open-Source Electronic Medical Record Software result it is seen that Developer 4 and is got the first rank whereas is the Developer 2 got is having the lowest rank.

#### 4. Conclusion

Electronic medical record for to support continuous quality improvement Blocked colonoscopy. Information extracted from EMR text Extensive studies has shown that identification has been used different levels of success at different levels. Most research to date using hospital-based EMRs from research groups in the United States. Incorporating information extracted from text into case-detection algorithms May benefit in terms of improved sensitivity and specificity. Health information According to context, EHR software is a basic requirement (Core EHR) to be fully functional interconnected Up to the electronic health information environment can be classified into three levels. The results reveal that HF-WASPAS performs well and is in good agreement with existing ones. the developed approach of Key features include ease of computation on HFSs, use of a procedure to estimate more acoustic criterion weights, and increased stability of the approach. In the future, the HF-WASPAS approach of the MCDM process with HFSs Can is used for problems with the same configuration. Also, using various MCDM platforms Lets expand on the improved approach. Weighted Aggregate Product Assessment (WASPAS) determines the best solution it is evident from the results access to Developer 4 is got the first rank whereas is Developer 2 is having the lowest rank.

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