Evaluation of Medical Record Data Utilization for Marketing Information Systems at PKU Muhammadiyah Hospital Temanggung

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Abstract. National health development in Indonesia encourages the use of data in health services. The patient's electronic medical record becomes a big data source. Well-managed data can provide the information needed in marketing management, especially for private hospitals. RS PKU Muhammadiyah Temanggung has implemented electronic medical records starting with the use of *a billing system* in 2014. The data managed includes patient demographics. It is necessary to evaluate the use of this data in terms of *man, materials, machine, method, money and markets.* This research is descriptive qualitative. Process taking data done with do interviews and observations. The marketing information system design process carried out together team I.T using the *waterfall method* in where designer system finish the concept with through process study References And Taking inspiration from various CRM (*Customer Relationship) models Management*). The research results show that electronic medical record data has been used as material for marketing information systems. *Man* and *money* readiness makes it easier to build a marketing information system *menu bar on the management information system dashboard.* It is still possible to develop the system in terms of *materials* and *machines.* Data utilization methods are transforming from manual to *digital* gradually. This is influenced by the readiness of future potential data users to become part of marketing information system developers using electronic medical record data.

Keywords: Menu bar, Marketing, Data, Electronic medical Records.

1   Introduction

National health development in Indonesia is considered a productive investment that contributes to improving the quality of human resources. The government has emphasized the urgency of accurate data in the health sector through Minister of Health Regulation No. 18 of 2022 concerning One Health Sector Data, which underlines the importance of accurate and integrated information.

The relevance of medical records in this context is manifested in Law No. 44 of 2009 which requires hospitals to maintain medical records. Professional standards for Med

ical Recorders and Health Information (PMIK) are regulated by Minister of Health Decree No. 312 of 2020, includes competencies in health data and information management.

A focus on patient demographic data was identified as an integral element of the medical record that has a significant impact on hospital development. However, preliminary studies show that the use of this data is still not optimal, and the implementation of Management Information Systems (MIS) does not fully meet marketing needs. The importance of hospital marketing is recognized as a crucial factor, as shown by previous studies.

The importance of marketing data related to demographic and psychographic market segmentation is also highlighted, referring to Prasetyo's (2017) research. Therefore, this research aims to explore the need for a business intelligence dashboard that can integrate marketing data, especially patient demographic data, in order to increase the effectiveness of hospital marketing.

Based on this background, this research is expected to provide an in-depth understanding of the role of medical record data, especially patient demographic data, in the development of marketing information systems at RS PKU Muhammadiyah Temanggung. By focusing on evaluating data utilization and developing the marketing menu bar on the dashboard, this research is expected to provide guidance for increasing the efficiency and effectiveness of hospital marketing as well as contributing to the overall performance of the institution.

2   Research methods

2.1   Data collections

The research used interview and observation methods in the management information system of RS PKU Muhammadiyah Temanggung since 2014. Observations involved the patient service process, from registration to follow-up through return contact. Intelligent marketing processes, especially customer care tasks, are observed in detail. Interviews were conducted to evaluate the use of electronic medical records as a marketing information system, determine user needs, and assess the IT team's ability to facilitate the needs of marketing information system users.

System Development Model.

Data processing:
    a.   Editing:
The researcher checks the interview data, writes the results into the appropriate column, and deletes irrelevant data.
    b.   Koding (Coding):
Similar data is coded and then collected based on similarity of answers or frequency of appearance.
    c.   Tabulation:

Researchers created the necessary tables, compiled codes, and organized them in Microsoft Excel.

Data analysis:
Researchers separate answers according to the 6 M categories, draw conclusions, and compare them with the theoretical basis.

1. Preparation of Data Flow Diagrams (DFD):

Literature Review:
The author draws inspiration from the literature, holding discussions with the IT team using the waterfall method. After the testing stage, the system was refined using agile methods.
Menu Bar Creation Process:
Researchers discuss the steps for creating a marketing menu bar on the hospital management information system dashboard.

2. Prototype Testing and Its Use in Marketing Tasks.
3. User Evaluation and Brainstorming and Developer Elements.
4. Preparation of Final Report.

3   Results and Discussion

3.1   General description of RS PKU Muhammadiyah Temanggung

RS PKU Muhammadiyah Temanggung was founded on October 12 1989 and celebrates its 34th anniversary this year. The hospital's vision is to become a trusted and quality hospital providing Islamic health services with comprehensive, superior and selected service coverage. Initially, the vision of this hospital was focused as an "e-world hospital" which supports comprehensive health services and becomes a reference for PKU Muhammadiyah Hospital in Indonesia, based on faith in Allah SWT.

In developing electronic medical records, this hospital experienced challenges at first because most employees were not used to using computers. However, through the development team's hard efforts, they managed to achieve a proud achievement. In 2014, RS PKU Muhammadiyah Temanggung adopted a billing system, integrating nurses, doctors and other health workers in the form of an e-world hospital.

This hospital's organizational structure places managers who oversee public relations, marketing and IT, with each assistant manager to ensure effectiveness in these three areas. Team solidarity and focus on developing management information systems are reflected in the organizational structure depicted.

Evaluation of the Use of Medical Record Data for Marketing SIM. This research involved 8 informants from various structural levels at RS PKU Muhammadiyah Temanggung, from directors to marketing, medical records and IT staff. The interview

results show that all informants consider marketing information systems to be very important for hospitals, especially in making managerial decisions. They stated that this system makes it easier to access data, provides regular reports, and supports system development. The following is a recap of related informant data, as shown in Fig.1.
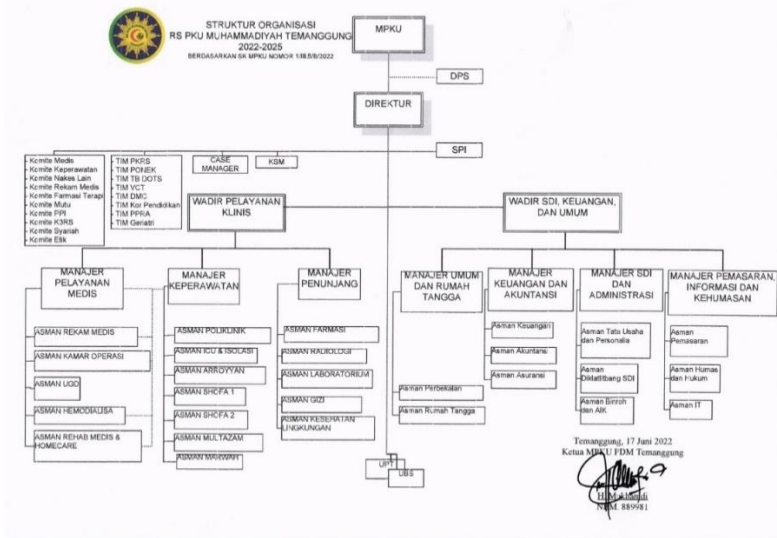

Fig. 1. Structure RS PKU Muhammadiyah Temanggung organization

Source: pkutemanggung.org

Table 1. Perceptions Regarding the Importance of Marketing Information Systems

No	Informant Code	Perceptions Regarding the Need for Marketing Information Systems
1	I1	Important
2	I2	Important
3	I3	Important
4	I4	Important
5	I5	Important
6	I6	Important
7	I7	Important
8	I8	Important

The data shows that all informants consider marketing information systems to be very important (Table 1). The development process involved discussions with the IT team and produced a Data Flow Diagram (DFD) as a guide. This process was carried out using waterfall and agile methods, with updates and revisions during testing. The marketing menu bar prototype trial involved the marketing team and RMIK, with positive results regarding ease of access and validity of information.

Evaluation based on machine factors and marketing information system development plans. The management information system development process involves documentation and gradual improvements to the business sub-system utilizing electronic medical record data. The IT team responded challenges, such as data consolidation, with the implementation of agile methods. The marketing menu bar is integrated into the BERLIAN dashboard and developed in stages (Fig. 2), starting from accessing customer data based on address. The overall development proves its benefits in increasing service efficiency and supporting marketing strategies. Appearance dashboard and menu bar is as following on Fig. 3.
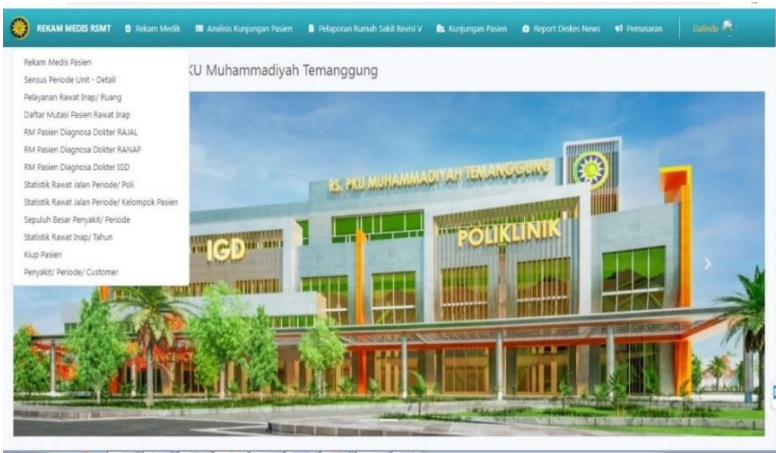
Fig. 2. DIAMOND Views

Fig. 3. Menu bar

Evaluation based on method factors. Evaluation based on the method shows increased efficiency in the use of electronic medical record data. With one click on the marketing menu bar, officers can immediately access information such as the patient's address and the referring health facility, speeding up the work process significantly.

Evaluation based on the money factor (Money). Money or fund allocation is considered crucial in management and reflects the organization's readiness to develop marketing information systems. Interviews show that the board of directors has an open view towards this development, allowing the placement of marketing responsibilities into a central focus within the company. Team additions and system development are not considered to be obstacles assuming there is good communication through terms of reference (TOR).

The importance of TOR as a managerial communication tool emphasizes the need for good understanding by all assistant managers involved in developing marketing information systems. In answering questions about the availability of funds for system development research, the board of directors responded positively and suggested creating a TOR to discuss targets and funding.

Regarding the budget, informants from the board of directors expressed confidence that funds were sufficient in line with the development of the hospital. If a shortage occurs, the use of personnel from various departments can be accommodated with additional incentives as a form of compensation.

Evaluation based on market factors (market). The market in developing a marketing information system at RS PKU Muhammadiyah Temanggung refers to potential users of the system, including marketing management, leadership, and owners (or representatives of owners). The development of this system aims to meet the market needs of those interviewed, represented by directors and marketing structures, with the same dream regarding the need for a marketing information system.

The response to the question about market readiness for the menu bar was positive, with the hope that there would be an internet-based marketing information system that could be accessed via gadgets such as cellphones, and provide routine reports that were easy to access. This is in line with the hospital's tagline regarding professionalism, where service providers are increasingly qualified with the support of various technologies.

Optimism is also reflected in the responses of informants with IT backgrounds, who believe that data users will be facilitated by this information system. Medical records and marketing officers stated that all parties would be helped by the marketing information system, and marketing staff specifically mentioned that customer care officers would be the ones who would benefit the most. This convenience is confirmed by general access to the dummy from the marketing menu bar, allowing customer care officers to easily access patient telephone number data to facilitate the blasting process, namely sending messages to various numbers in the database.

3.2   Discussion

Evaluation Based on Man Factors (Human Resources). The evaluation of human resources at RS PKU Muhammadiyah Temanggung involved medical records officers, system technicians, IT, and leaders from various levels. Awareness of the importance of technology adaptation can be seen from the directors' views and a high level of understanding of marketing, as evidenced by the position of marketing manager and assistant manager in the hospital structure.

Medical record officers are willing to be involved in system development, stating that the existence of a medical record information system will make it easier to present data. The IT team has basic skills in coding, but meeting user needs requires lengthy discussions. Communication between medical records officers, IT and marketing need to be bridged.

Initial interviews and observations have been carried out since the preparation of the proposal, with a structured interview guide. Observations were carried out on the hospital management information system since 2014, and the patient service process was observed from registration to follow-up. Intelligent marketing processes and customer care tasks are also observed.

Data collection used interview guide instruments, literature review, and work. The interview instrument was adapted to the informant, and discussions were held with various parties, such as directors, medical records officers, IT and marketing.

Evaluation Based on Material Factors. Material evaluation focuses on the influence of the material on the development of machines or information systems. The communication bridge between medical records and marketing uses an information system. Understanding the data needed by the marketing team is the starting point for creating an information system. Technical communication between marketing and IT staff needs to be bridged.

Evaluation Based on Machine (Machine). Medical record data, especially patient demographics, is utilized in marketing information systems. The marketing menu bar makes data access easier for marketing staff and leaders. The use of this data is directed at customer relationship management (CRM). Data mining processes and marketing information system development are emphasized.

Evaluation Based on Method Factors. The system was built to speed up marketing data analysis. The use of artificial intelligence (AI) is expected to facilitate the preparation of analysis. The development of faster analytical methods is a focus. Utilization of AI will support customer maintenance and increase engagement.

Evaluation Based on the Money Factor (Money). Availability of funds is a key factor in development. Financial support from the board of directors is indicated as positive,

but clarification is needed between informants I1 and I8. Better communication is proposed through discussions or Focus Group Discussions (FGD) between stakeholders. Financial support is considered an extraordinary contribution.

Evaluation Based on Market Factors (Marketing Information System Users). Market expectations are represented by potential users of marketing information systems. The marketing menu bar was deemed useful, and the IT team readily accepted input for development. Requests for ways to access data from marketing managers and leaders increase the usefulness of marketing information systems. The use of demographic data for marketing actions has been proven.

Informant I3 provided development suggestions to researchers regarding various ideas for developing marketing information systems, especially CRM-based. Strategic marketing analysis and the role of system analysts from PMIK officers are considered to have potential to support marketing decision making.

Thus, the 6M evaluation approach on human, material, machine, method, money and market factors has described the conditions and potential for developing a marketing information system at RS PKU Muhammadiyah Temanggung. Further steps are proposed, such as better communication between informants and the application of technology such as AI to speed up marketing data analysis. Financial support and the involvement of PMIK officers as marketing system analysts can be key factors in successful development.

4 Conclusion

Based on this research, it shows that RS PKU Muhammadiyah Temanggung has sufficient and competent human resources to utilize electronic medical record data in building a marketing information system. Medical record data was identified as having great potential for the development of marketing information systems. The marketing information system in the hospital has significant development potential, and the spirit of continuous quality improvement is considered the main driver for further development.

System development is carried out through a combination of action research and assembling existing potential. The financial aspect (Money) is also well supported, especially if communication through the submission of program terms of reference or Terms of Reference (TOR) is carried out effectively. Prospective users of marketing information systems, involving management and marketing staff, provide support, and the innovative and creative culture at RS PKU Muhammadiyah Temanggung also supports the development of this system. Overall, this research provides a solid foundation for improving the efficiency and effectiveness of the hospital's marketing. This research has several limitations. Firstly, it does not discuss Geographic Information Systems (GIS), which could offer valuable spatial analysis. Secondly, it does not explore the Data Mining process in marketing SPOs. Thirdly, the Marketing Management Information System (SIM) is not yet connected to the quantitative assessment of marketing value, limiting the study's ability to evaluate marketing performance comprehensively. Lastly, the development process did not incorporate all suggestions from informants,

possibly overlooking important perspectives and recommendations. For the suggestions, this research provides a basis for developing a better marketing information system at RS PKU Muhammadiyah Temanggung.

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