

# THE BENEFITS OF SOFTWARE SOLUTIONS IN MEDICAL PATIENT CARE. A DOCVISER ONCOLOGY CASE STUDY.

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**Abstract:** *This paper presents a study that looked at the influence of Docviser, an oncology patient management app, on the efficiency and quality of patient care in a hospital context. The research topic was whether doctors could take advantage of Docviser to save time on drug management activities and enhance dosage calculation accuracy. A semi-structured interview with a doctor who had been using Docviser for over a year was conducted. The software considerably reduced the time spent on medication management activities, with treatment administration time cut by at least two hours per patient, according to the data. According to the study, using Docviser provides evident benefits for patient care, such as greater speed and accuracy, as well as improved communication among doctors, pharmacists, and nurses. The findings have significance for medical practitioners, hospital administrators, and governments interested in improving patient care and lowering costs. The study's shortcomings include a small sample size and a narrow area of inquiry, indicating the need for additional research on the app's impact on costs as well as patient outcomes.*

**Keywords:** *Docviser; Oncology; Patient management; Healthcare technology.*

**JEL Classification:** *M15; I15*

## Introduction

### Background and Rationale for the Study

The healthcare industry is facing increasing pressure to provide high-quality patient care while reducing costs and improving efficiency. To address these challenges, healthcare providers are turning to technology, such as software solutions, to help improve patient outcomes and streamline operations (Adler-Milstein, 2017). One such software solution is the Docviser oncology platform, designed to support medical professionals in diagnosing and treating cancer patients. This platform provides physicians with access to a range of features, such as real-time access to

patient data, decision support tools, and patient management features, all of which can contribute to improved patient care.

This research aims to explore the benefits of software solutions, specifically the Docviser oncology platform, in medical patient care from a business perspective. To achieve this, we will conduct a case study of the Docviser platform's impact on patient care outcomes in the oncology department of a county hospital in Romania. We will focus on evaluating the platform's ability to improve patient care, reduce costs, and enhance operational efficiency.

Previous studies have shown the potential of software solutions to improve patient care outcomes, but there is a need for more empirical evidence to support these claims (Lluch, 2011). Furthermore, there is a gap in the literature regarding the business perspective of the benefits of software solutions in healthcare. This study aims to fill this gap by providing insights into the business benefits of the Docviser oncology platform and its impact on patient care outcomes.

The findings of this research will have implications for healthcare providers, policymakers, and software developers. By understanding the benefits of software solutions in medical patient care from a business perspective, healthcare providers can make informed decisions about the adoption of such solutions to improve patient outcomes, reduce costs, and enhance operational efficiency (Topol, 2012). Similarly, software developers can use this research to develop software solutions that better meet the needs of healthcare providers and their patients.

### **Purpose and Objectives of the Study**

This study aims to investigate the operational advantages of software solutions, particularly the Docviser oncology platform, in medical patient care. The paper's specific goal is to assess the effect of Docviser on patient treatment flow in a county hospital's oncology section.

The research aims to accomplish the following specific goals:

- To investigate the effect of the Docviser oncology platform on operational efficacy within the hospital's oncology section, including decreased patient wait periods, increased staff productivity, and better workflow.
- To assess the cost-effectiveness of adopting the Docviser oncology platform within the hospital's oncology section, including possible expense savings and income growth.
- To identify the difficulties and impediments that may hamper the adoption of the Docviser oncology platform within the hospital's oncology section, and to make suggestions for overcoming these obstacles.

The study's results will have far-reaching consequences for healthcare providers, lawmakers, and program developers. The research will shed light on the commercial advantages of healthcare software solutions, such as improving patient outcomes, lowering expenses, and increasing operational productivity. Overall, this research will add to the increasing corpus of writing on the benefits of software solutions in healthcare and will provide critical insights into the Docviser oncology platform's effect on patient care outcomes.

### **Development of the conceptual framework**

Every part of the economy has benefited from the IT industry. The healthcare industry is no different from them. Software solutions are employed to minimize manpower for labour-intensive or time-consuming tasks through automation and benefit from intelligent software solutions that not only store data in electronic form but also expedite the decision-making process. An important scope is also to speed up your business by delivering a service concurrently and providing maintainable and consistent service (Kabakus & Kara, 2016).

In sectors such as trade, media and advertising, lack of digitization means non-existence in the market. With the help of innovative technologies such as machine learning, artificial intelligence, and the Internet of Things (IoT), a significant increase in revenue is expected and the short-term investment is amortized (BÂRU, et al., 2019). Regardless of the degree of digitization, one thing is certain. Any section of the economy requires some degree of digitization to survive in the market. The medical field, which belongs to the service industry, can be said to be a field in which digitization has progressed further. Romania's situation is a little more specific than the situation in Europe and at the global level. According to (Eurostat, 2019), Romania's healthcare expenditure relative to the GDP is 5,74%, which is 4,18% lower than the EU average expenditure, and the third lowest in the entire EU.

Current healthcare expenditure relative to GDP, 2019

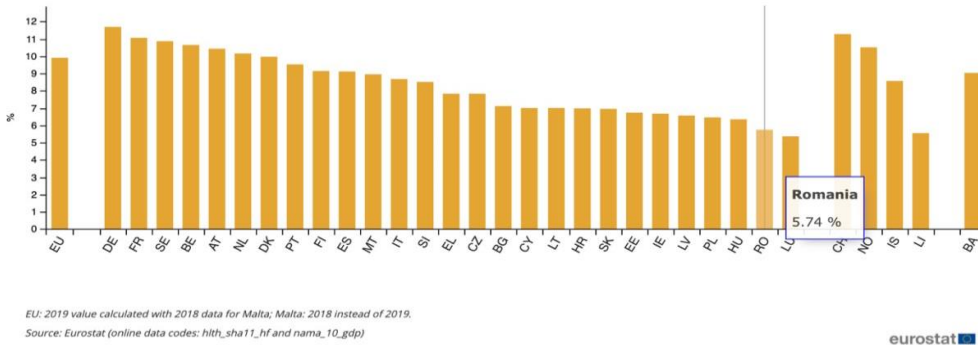


Figure 5: Healthcare expenditure relative to GDP in the EU  
Source: (Eurostat, 2019)

This is mainly due to the state system in Romania where medical conditions are not always at the highest level (BÂRU, ABRUDAN, FETTI, NICULA, & VOINA-TONEA, 2019). Of course, there are also European-level government agencies with good staff and facilities, but mostly below the EU average. And when it comes to the deficit in healthcare services, digitization is less of a priority than a “must have” and emerges as an ideal usually not found in the investment plans of healthcare institutions.

Also, patient safety has become an increasing concern in recent years. It is estimated that 1 in 10 patients will experience a hospitalization-related adverse event field. The greatest risk factors associated with these events are ineffective care processes, poor communication, and lack of documentation. Hospital communication challenges include large multidisciplinary teams with complex hierarchies managing patient care, large amounts of time-sensitive clinical information, and moving within and between hospitals and healthcare facilities, staff included. Traditional communication platforms such as paging are unreliable and two-way communication is difficult. Furthermore, the digitalization of the Romanian healthcare service sector is a subject of particular importance since there is an obvious crisis in hospitals all around the country from several points of view: from personnel shortages, and basic medical supplies management, to leveraging crucial patient data for research and labour management.

It seems that the Romanian authorities acknowledged these issues, and according to (Ministry of Health, 2022), the government made a commitment in the strategy for 2022-2030 to develop and implement a national eHealth strategy and strategic plan for health information systems that will provide the following goals and interventions:

- construction of an integrated information system in the field of health,

- institutional and technical frameworks for their coordination and management,
- coordinating and consolidating the current information systems administered by the Ministry of Health, the National Health Service, other public agencies in the field and the public health sector,
- development of information systems for decision support,
- interoperability with information systems used by commercial healthcare providers.

The chosen topic thus comes in line with the increasingly obvious realities as a result of Romania's involvement in a new stage of development, thus being a favourable moment for the analysis of a real functioning product, already being used in multiple oncology hospitals in the country, that has outputted amazing results.

### **Synthesizing and clarifying the concepts of medical IT systems**

Medical information technology (IT) systems are a type of software solution that is designed to support healthcare providers in managing patient care. These systems typically include features such as electronic health records (EHRs), clinical decision support tools, patient management features, and other functions that can improve patient care outcomes (Kashyap, 2018). The use of medical IT systems has been shown to improve the quality of patient care, increase efficiency, and reduce healthcare costs (Bates, 2014).

To better understand the benefits of medical IT systems, it is important to clarify some key concepts. Electronic health records (EHRs) are one of the most used medical IT systems. EHRs are digital versions of a patient's medical history and include information such as medications, allergies, test results, and diagnoses. The use of EHRs can improve patient safety and reduce medical errors by providing healthcare providers with real-time access to patient data (Blumenthal, 2011).

Clinical decision support tools are another important component of medical IT systems. These tools can assist healthcare providers in making more informed treatment decisions by providing real-time access to clinical guidelines, treatment recommendations, and other relevant information (Kawamoto, 2005). The use of clinical decision-support tools has been shown to improve patient outcomes and reduce healthcare costs (Bates, 2014).

Patient management features are also commonly included in medical IT systems. These features can assist healthcare providers in managing patient care by providing access to patient data, appointment scheduling, and other important functions (Kashyap, 2018). The use of patient management features has been shown to improve patient satisfaction and reduce healthcare costs (Bates, 2014).

The integration of medical IT systems is an important consideration for healthcare providers. Integration refers to the ability of different medical IT systems to work together and share data seamlessly. The integration of medical IT systems can improve patient care outcomes by providing healthcare providers with a more complete picture of a patient's medical history and treatment plan (Ammenwerth, 2012).

Despite the potential benefits of medical IT systems, there are challenges in implementing them in healthcare settings. One of the main challenges is the cost of implementation, including the cost of purchasing and maintaining the systems, as well as the cost of training healthcare providers to use them (Hillestad, 2005). Additionally, there may be resistance from healthcare providers who are accustomed to traditional paper-based systems (Jha, 2009). Finally, there may be concerns about patient privacy and data security (Blumenthal, 2011).

Medical IT systems, including software solutions such as the Docviser oncology platform, can provide significant benefits in providing documented, effective and high-quality patient care. Electronic health records, clinical decision support tools, and patient management features are some of the key components of medical IT systems. Integration of medical IT systems is important for improving patient care outcomes, but there are challenges in implementing these systems in healthcare settings. By understanding the benefits and challenges of medical IT systems, healthcare providers can make informed decisions about the adoption and integration of these systems to improve patient outcomes, reduce costs, and enhance operational efficiency.

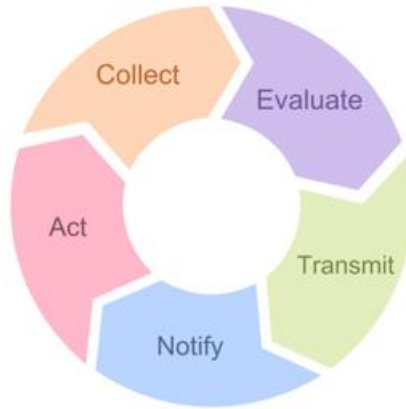
### **Introducing the Docviser oncology platform**

Docviser is a medical platform created for better patient data and treatment management that ultimately results in a more efficient treatment process and predictability. It was developed with the direct participation of medical oncologists and tailored to their needs. Docviser streamlines the flow of information from patients to physicians, medical staff and pharmacists by displaying the real-time status of treatment protocols. It is an app that is paving its way into providing quick care management for cancer patients and provides (Docviser, 2021):

#### *Improved health data collection*

Accurate and up-to-date data is critical for providing high-quality medical care, especially when lives are at risk. As a result, the app enables clinicians to gather and save crucial data for each patient, ranging from basic data such as vitals, weight, height, age, and gender to more intricate data such as prior diagnostic and treatment protocols, electronic medical files, and so on. Based on this, there is the potential to

make significant advances in the centralization and efficiency of patient care information. In addition, having electronic health records (EHR) enables the generation of structured data on the patient's health status.



**Figure 2: Docviser information flow**  
Source: Own source

#### *More accurate diagnosis*

Because every patient and case is unique, it can be difficult for a doctor to establish an accurate diagnosis in part to the number of variables and aspects that must be considered in the medical sector. As a result, having all the relevant patient health status data consolidated on hand, together with the computational aid of medicine dosage and creatinine, makes it much easier for a professional to offer a diagnosis, significantly reducing mistakes. At the end of the day, this improves the efficacy of patient care.

#### *Customized treatment protocols for every patient*

Because every patient already has an EHR and a certain diagnosis, the app supports clinicians in prescribing the most exact treatment plan, complete with the proper dosage and chemical compositions. Docviser has created an internationally recognized database with over 440 Treatment protocols that are constantly updated by oncology doctors. Docviser ensures correct therapy options for each tumour localization, allowing the oncologist to pick or, if necessary, assign a new treatment.

#### *The capability to track drug administration*

After the doctor gives a diagnosis and assigns the appropriate treatment for the patient, the protocol is validated by the app. The case information about the treatment is then shared with the pharmacists to prepare the necessary drug. Furthermore,

doctors can appoint caregivers to schedule and administer the required medication to the patient.

### *The ability to communicate between doctors and physicians*

Docviser allows for cross-clinic treatment protocols for patients, which means that doctors may consult and seek advice from other professionals who use the app. Communication can take place via videoconference, comments, notes, or phone calls. At the same time, patient case folders may be shared and examined, allowing for more effective engagement and knowledge sharing of the circumstances.

What differentiates certain healthcare facilities from others is their ability to recognize the information and data they generate and use that information productively in patient care (Docviser oncology, 2021). Therefore, Docviser was designed to be the hub for cancer care services in the healthcare industry. This platform becomes an essential tool for medical centres. Used properly, it not only opens new horizons in cancer treatment and research. Using machine learning, artificial intelligence, big data and other intelligent technologies can revolutionize the healthcare system as we know it.

## **Research Methodology**

This chapter describes the research methodology utilized in this study, which sought to determine the influence of Docviser on the efficiency and safety of healthcare delivery. The sections that follow describe the study strategy and approach, the development of the research questions, data collecting, data processing and research question testing.

This study employed a qualitative technique, specifically a semi-structured interview with a doctor who had been using Docviser for a year. The semi-structured interview allowed for some flexibility in inquiry while also ensuring that all important topics were covered. The face-to-face interview was intended at collecting the doctor's perceptions and experiences using Docviser, particularly in terms of its impact on healthcare efficiency and safety.

Based on the evaluation of the literature, the following questions were developed for this study:

*RQ 1:* Does Docviser minimizes the number of time doctors, pharmacists, and nurses spend managing the overall clinic flow?

*RQ 2:* Does Docviser shortens the wait time for patients visiting the clinic for treatment?

*RQ 3:* Does Docviser results in faster treatment allocation?



*RQ 4: Does Docviser increases medicine administration safety by assuring correct dosage estimations?*

These research questions were created using Docviser's primary features as well as current literature on the influence of similar technology on healthcare efficiency and safety.

A semi-structured interview with a doctor who has been using Docviser for over a year was used to obtain data for this study. The interview lasted about an hour and was aimed to gather the doctor's perceptions and experiences using Docviser. The interview was recorded with the interviewee's permission and afterwards transcribed for analysis. The doctor was asked about their experience with Docviser, including the influence on workflow, time spent on various tasks, and dosage calculation correctness, throughout the interview.

The data gathered from the interview was examined using a content analysis method. The data were analyzed to look for themes and patterns linked to the research hypotheses, and the results were summarized for easy comparison. The quantitative data provided by the interviewee was also examined using descriptive statistics to determine the degree of change in the clinic's efficiency and safety as a result of Docviser adoption. The findings were then compared to the hypotheses that had been developed earlier to see if they were supported or rejected.

## **Empirical Results**

The findings of the empirical investigation done to test the research questions outlined in Chapter 3 are presented in this chapter. The study investigated the influence of Docviser on clinical workflow and patient outcomes based on input from a doctor who had been using the platform for a year.

### **Presentation of the empirical findings**

#### **The Impact on Clinic Workflow**

The study's empirical findings reveal that using Docviser, a medical software developed to ease communication and coordination among healthcare workers, resulted in significant improvements in healthcare process efficiency. Table 1 summarizes the findings.

**Table 1:** Comparison of healthcare processes with and without Docviser.

<b>Actions</b>	<b>Average duration without Docviser</b>	<b>Average duration with Docviser</b>
Documentation analysis	15 min	3 min
Treatment allocation	10 min	5 min

<b>Actions</b>	<b>Average duration without Docviser</b>	<b>Average duration with Docviser</b>
Send treatment for preparation	1 h	0 min
Send medicine for administration	1 h	20 min
Time spent for explanations and observations	1 h 20 min	20 min
<b>Total</b>	<b>3 h 25 min</b>	<b>48 min</b>

Source: Interview

The data in the table clearly indicates the enormous influence that Docviser's implementation had on the clinic's operational efficiency. The time spent on document analysis was cut by 80%, from 15 minutes to 3 minutes. This is a vital part of the clinical workflow because it ensures that patient records are correct and up to date, allowing doctors to make educated decisions about patient care. Doctors may focus more on their patients and deliver better care since they spend less time analysing documentation.

The time spent on treatment allocation was also cut in half, from 10 minutes to just 5 minutes. This is an important phase in the patient care process because it ensures that patients are receiving the appropriate treatments for their unique problems. Doctors can utilize Docviser to quickly allocate treatment protocols, minimizing the time patients spend waiting for treatment, improving patient outcomes, and increasing overall satisfaction.

A key advantage of adopting Docviser is the removal of the time spent on delivering treatment forms for preparation. This step used to take an hour, but with the help of Docviser, it is now eliminated. This reduction in time allows doctors to provide faster and more efficient care, resulting in a better experience for patients and a more streamlined clinical workflow for healthcare providers.

Similarly, the time spent delivering medication to be administered was lowered from 1 hour to 20 minutes. This is significant because it guarantees that patients receive the medication they require on time. The time saved can be put to better use, allowing healthcare providers to provide more efficient care and improve overall patient outcomes.

Finally, the time spent on explanations and observations was decreased from one hour and twenty minutes to only twenty minutes. This time savings is advantageous to both doctors and patients. Doctors can explain treatments to patients promptly and precisely, allowing patients to better understand their care. This reduction in time is mostly due to the ability to leave comments and observations for every treatment sent for preparation. Furthermore, Docviser also facilitates a clinic chat, where

clinicians and personnel can promptly communicate regarding any issue they have. This also means that oncologists can devote more time to other parts of patient care, boosting overall patient outcomes and staff job satisfaction.

Overall, the data in the table clearly illustrates the enormous influence that Docviser's use had on the clinic's operations. Doctors may provide faster, more efficient care by minimizing the time spent on essential elements of the clinical workflow, resulting in greater patient outcomes and overall satisfaction. The clinic's workflow has been improved because of the adoption of Docviser, allowing healthcare providers to act more efficiently in the day-to-day operations, as well as patient satisfaction.

### **Impact on patient**

According to statistics acquired from the doctor's clinic, the use of Docviser had a substantial impact on the amount of time patients spent in the clinic for treatment. Patients spent an average of 5 hours at the clinic without Docviser, but with Docviser, this time was decreased to just 3 hours. This means patients spend 2 hours less time in the clinic, which is a considerable reduction in waiting time and can improve the overall patient experience.

Furthermore, shorter wait times might lead to higher patient satisfaction and better patient results. Patients who are forced to wait for an extended period may become frustrated, nervous, or upset, significantly impacting their whole experience and even their health outcomes. Patients can benefit from speedier treatment allocation and medication delivery with Docviser, which can assist to mitigate these unwanted effects.

Furthermore, a reduction in waiting time might contribute to better clinic efficiency. Patients can be seen more rapidly with smaller wait times, allowing the clinic to handle more patients in a day. This can have a favourable impact on the clinic's overall performance, such as greater income and better resource allocation.

### **Dosage calculation**

Docviser's ability to perform exact and safe dosage calculations for drug administration is one of its primary features. To calculate the right dosage for each patient, the app considers a variety of patient-specific characteristics such as height, weight, comorbidities, gender, and age. Docviser's dosage calculation algorithms are based on internationally accepted best practices, ensuring that patients receive the correct prescription dosage for their condition.

According to the doctor's interview, using Docviser for dosage computation resulted in 100% safer dose administration. This is a huge advance over the previous manual

dosage calculation method, which is prone to errors and can have negative consequences for patients.

### **Analysis of the results**

In this section, we will go over the analysis of the findings from the empirical research on the use of Docviser in a clinical setting. We will explore how the data collected supports or rejects each research question proposed in the research methodology chapter.

Based on the results of the empirical research, it is possible to conclude that for the inquired hospital, all of the research questions proposed are justified and supported. However, there is a future research opportunity to be developed, as more and more hospitals around the country will adopt this platform. Furthermore, an economic analysis will also be possible, since all the implications from the operational benefits part of Docviser are to be translated into monetary terms.

#### **RQ1:**

The statistics given in Table 1 support this premise. Docviser greatly reduced the time spent on documentation analysis, treatment allocation, sending a treatment to be prepared, sending medicine to be administered, and explanations and observations. The overall amount of time spent on these activities was cut from 3 hours and 25 minutes to 48 minutes. As a result, using Docviser reduces the time spent by doctors, pharmacists, and nurses handling the full clinic flow by 80%.

#### **RQ2:**

The findings in the results presentation chapter also lend support to this hypothesis. The usage of Docviser reduced the time patients spent in the clinic for treatment from 5 hours to 3 hours. As a result, using this platform cuts waiting times for patients going to the clinic for treatment by 40%.

#### **RQ3:**

The findings in Table 1 also lend support to this notion. The usage of Docviser lowered the time spent on therapy allocation from 10 minutes to 5 minutes. As a result, it is possible to conclude that using Docviser allows for 50% faster treatment allocation.

#### **RQ4:**

This notion is reinforced by the fact that Docviser considers all aspects of the patient (such as height, weight, comorbidities, gender, age, and so on) and employs internationally accepted best practice calculation methods to calculate the dosage

automatically. This guarantees that the computed doses are correct and safe for the patient.

Finally, the empirical study data supports all of the assumptions that have been developed. The respondent claims that the usage of Docviser greatly saves the time spent by doctors, pharmacists, and nurses handling the complete clinic flow, minimizes patient wait times, enables faster treatment allocation, and provides 100% safer drug administration dose calculations:

*“Docviser helps me make better treatment decisions by leveraging the power of cutting-edge technology. I can now focus on what matters most – caring for my patients.”*

## **Discussion and Conclusions**

This section discusses the advantages of using Docviser in the medical area, which has resulted in major improvements in efficiency, accuracy, and patient care. The findings suggest that Docviser has reduced the amount of time spent on documentation analysis, treatment allocation, and medication administration, increased the precision and safety of dosage estimates, and provided a platform for seamless communication between healthcare providers and patients. A doctor who has been using Docviser for over a year has stated that the app has streamlined the medical treatment process and made it more patient-centred. However, there are several limitations to the study, such as the sample size being limited to one doctor's experience with Docviser, the concentration on the application of Docviser in a single medical centre, and the lack of financial implications of using Docviser in medical treatment. Future research should include a larger sample size from multiple medical centres with different patient populations and medical practice methodologies and assess the economic implications of using Docviser in medical treatment.

Future research should include a larger sample size from multiple medical centres with different patient populations and medical practice methodologies and assess the economic implications of using Docviser in medical treatment. Overall, the use of Docviser in medical care has considerable benefits for both healthcare workers and patients, but additional research is needed to thoroughly assess the app's potential benefits and limitations.

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