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Task Mining as a Catalyst for Automation: Realizing Process Improvement with Uipath in Healthcare Scheduling

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Abstract: The study focuses on task mining and automation with the use of UiPath to increase the efficiency of healthcare scheduling by identifying and automating repetitive tasks and workflows. Task mining comes with UiPath RPA to automate processes with improved efficiency using fewer errors and higher staff productivity. In Cleveland Clinic, NHS Foundation Trust and Mount Sinai Health System, a massive increase in scheduling efficiency, administrative load reduction, and patient access are achieved through examples. The primary contribution of this work is in providing an insight that automation can eliminate planning and scheduling related waste in group health care and social services as there are practical implications for how healthcare operations may be better as a result of automation.

Keywords: *Task mining, UiPath, automation, healthcare scheduling, workflow optimisation, Artificial Intelligence*

I. INTRODUCTION

A. Background to the Study

The healthcare scheduling task is a critical business process that involves appointment booking, updates and coordination with other departments across multiple healthcare departments, which is a time-consuming task. This is an inefficient, manual, repetitive, and error-prone process. As a result, there has been increased demand for the streamlined service delivery and quality care to patients and organisations, which have, in the meanwhile, started to look towards the use of digital solutions in healthcare [1]. Here, this can combine task mining with the UiPath automation platform and also use task mining to find repetitive workflows and turn them into automation that will improve accuracy and speed and will boost overall operations.

B. Overview

The study examines the viability of using task mining and UiPath as a point of leverage to facilitate automation within healthcare scheduling. The important part is that it seeks to track and analyse real-time user interaction in order to understand repetitive and intensive resource tasks conducted by staff [2]. As a result of this, automation was created to at least cut out a lot of manual work so errors can be minimalised and service can be delivered better. It is a method to automate scheduling tasks, maximize time for patient-focused activities, and maximise staff productivity.

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C. Problem Statement

The process of this manual data entry and switching systems creates an inefficient scheduling process that no healthcare organisation is able to deal with. More errors, delays in care of patient and employee burnout result. One does not routinely have time to view granular task-level activities, and therefore, traditional process improvements have little impact. This, therefore, makes the reason behind the need to code for automation and to adopt a method of data utilization, such as task mining [3]. Through the reduction of costs as well as greatly increasing optimal workflows, UiPath automation can improve such healthcare services in more efficient and reliable ways.

D. Aim and Objectives

The study aims to evaluate and determine how the task mining of UiPath can be utilised to improve automation in healthcare scheduling by highlighting and streamlining repetitive staff workflows in order to create better efficiency and accuracy. The objectives are: 1. To evaluate the repetitive task mining problem in healthcare scheduling workflows from task mining and identify repetitive tasks in healthcare scheduling workflows. 2. To assess how UiPath does in creating targeted automations based on task mining insights. 3. To assess the task mining-driven automation on the productivity and scheduling accuracy of staff in healthcare.

E. Scope and Significance

The scope of the study is the repetitive scheduling tasks in healthcare that are automatically handled via task mining and UiPath. It discusses that it is an opportunity to enhance staff productivity and errors and improve patient service delivery [4]. The significance will assist healthcare organisations in introducing intelligent automation for improving operational efficiency and the judicious use of resources for administrative work.

II. LITERATURE REVIEW

The Role of Task Mining in Workflow Optimisation

The study focuses on the process of mining to unleash variability management, which can identify the workflows by using different logs. The findings of the study on the aspect of their healthcare scheduling work are to verify that the task mining approach can be used to identify configuration workflow and repetitive tasks that can be standardised, automated, or mapped to task service providers [5]. Despite that, the technique is applied through UiPath in the same way, and healthcare providers will get to see how it works for scheduling and can automate the tasks using the automation solutions. As it turns to the use of advanced mining techniques to reduce manual workload, improve scheduling and also deliver service thus, this approach is given.

“Process mining (PM)”, a new method for “managing corporate processes”, has been used in a variety of fields over the past ten years, including “software engineering”, “manufacturing”, “supply chains”, “government”, and “healthcare”. The use of this technique is expanding but difficult, especially in the “healthcare industry” where the majority of procedures are complex, variable, dynamic, and “multidisciplinary in character” [6]. The study focuses on the process of mining in the healthcare, which can improve the efficiency of workflow by addressing

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bottlenecks automatically and providing information the activities for improvement. This can also enhance the data-driven decisions through the help of real-time data on tasks and processes. This also helps to decrease the errors and addresses and mitigates multiple risks related to the healthcare industry.

UiPath and Intelligent Automation in Healthcare

The study explores the UiPath in the healthcare industry that reflects the purpose of "Robotic Process Automation (RPA)", which is one of the most important and emerging fields in healthcare, especially in the digital transformation. This is used to automate repetitive tasks and redundant tasks and, as a result, also contributes towards making a large digital workforce. There are multiple service platforms which provide different tools for RPA [7]. The major three tools are "Automation Anywhere", "UiPath", and "Blue Prism". On the other hand, UiPath is a "Robotic Process Automation (RPA)" tool that is used by the organisation which operates in the healthcare industry to increase appointment scheduling efficiency and eliminate laborious manual tasks by analysing and using "incoming data" like "doctor availability", "patient symptoms", and more to set up different appointments to improve "patient efficiency".

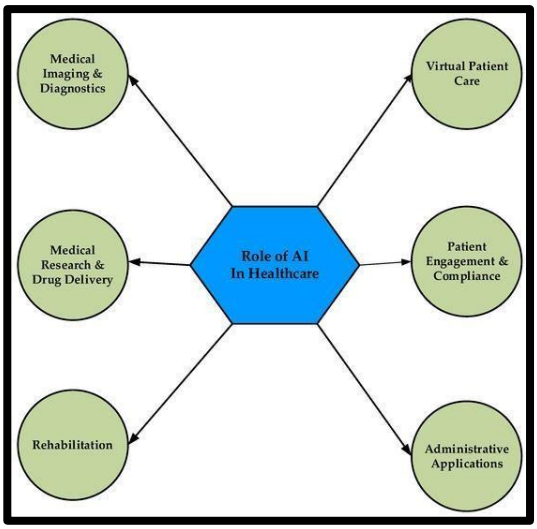

Figure 1: Application of AI in various aspects of healthcare

[21]

"Artificial Intelligence (AI)" change the whole healthcare industry by driving a transformation in how business processes are automated. Figure 1 highlights the application of AI in various aspects of healthcare, including medical imaging and diagnostic services, virtual patient care, medical research and drug delivery, and others. The study explores the role of AI in healthcare by streamlining workflows, decreasing operational costs, improving diagnostic accuracy, and enhancing patient. The focus of the study is also on the capabilities of technology and their adoption in healthcare domains such as "clinical decision support", billing, "patient record management", and "hospital operations" [8]. This study illustrates how "AI may transform healthcare business processes" through case-based examples, process visualisation, and

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literature analysis. Along with discussing the consequences, difficulties, and suggestions for future adoption, the study offers a tiered architecture for AI-driven automation.

Impact of Automation on Healthcare Staff Efficiency

The study proves that automation does not entail the loss of vast numbers of jobs but has an influence on employment structure. This lays down an argument specifically in the healthcare context where here, making a schedule for repetitive tasks, actually makes the staff more efficient, not to replace a staff. Once healthcare workers can automate the boring, which cannot deliver the personal touch, they will have more time for that, focus on patients' care and acquire the service quality [9]. Last, the study confirms what automation can do, which is be used as a force to spur workforce evolution, enabling employees to continue working on higher value duties, making the organization more productive and keeping job satisfaction high within these healthcare scopes.

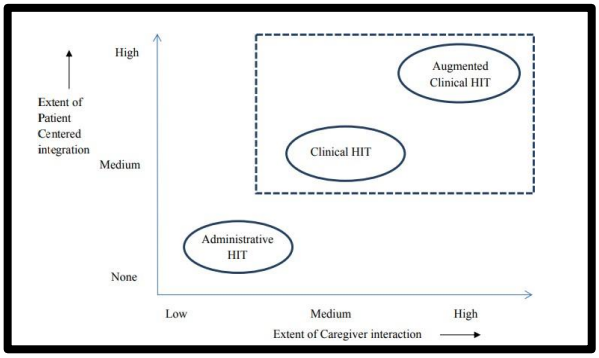

Figure 2: Hospital information technology bundles

[10]

The study employs econometrics to examine whether "health information technology (HIT)" bundles have a positive impact on hospitals' performance. Through their study, they demonstrate that integrating various HIT systems, such as scheduling, patient record and communication tools, helps in very efficient, accurate and good patient outcomes in hospital. Combining task mining and automation supports the use of platforms like UiPath in healthcare scheduling to boost the company's operating performance [10]. Therefore, this research stresses that the usage of digital tools in operations provides significant improvement of the hospital productivity and service quality if they are properly integrated into the operations process.

III. METHODOLOGY

A. Research Design

The data collected is used by the research design framework for this study to address and decide the path of the investigation. ***Explanatory research design*** is used for the study that provides better insights into the topic, which is task mining as a catalyst for automation. This research design helps to explore more information based on the limited source of information. This research design helps to understand the complexity of the study and explain in an easier way.

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B. Data Collection and Analysis

The ***"secondary qualitative and quantitative"*** method of data collecting was employed in this study. Numerous sources are used in the qualitative data technique, such as industry reports, articles, journals, websites, and so forth. However, the quantitative data method examines the range of secondary data-derived graphs and charts that can help quantify particular data, such as task mining as a catalyst for automation. All the information that is collected is from accurate and informative sources.

C. Case Studies/Examples

Case Study 1: Implementation of UiPath's automation tools in Cleveland Clinic

Cleveland Clinic was able to automate administrative tasks for scheduling patients and billing on its own using UiPath tools. They used the results from task mining to find tasks with low value to the user that they automated with good gadgets, in that the user got paid to do, assuming they had very second-rate tasks. These tasks were resolved by UiPath bots, freeing up staff time to care for direct patients. Roughly, UiPath offers the ability to create workflows and automations with a simple "drag and drop" [11]. In this case, the data discussed helps in understanding some real task data so that intelligent automation can be driven in large healthcare institutions to drive performance and satisfaction of patients.

Case Study 2: Dexcom's efficiency with AI-powered automation, unlocking 200,000 hours

Using Task Mining from UiPath, Dexcom enhanced its healthcare scheduling tasks. With the number of manual prescription entries climbing from 300 to 600 crewmembers needed to keep up each week, Dexcom used Task Mining to study how their employees worked and find problems that could be fixed with automation [12]. Because of this effort, prescriptions are now processed automatically, and this is estimated to save more than 200,000 work hours each year [12]. The completion of this project both improved operations and made it possible for the company to apply AI in additional ways.

Case Study 3: Automation in Max Healthcare

Max Healthcare used UiPath's "Robotic Process Automation" (RPA) to make their administrative tasks, such as data matching and processing insurance claims, more efficient. Handling the entry of information from various file formats and validating patients in several systems caused the organisation problems. Using RPA tools from UiPath, Max Healthcare managed to automatically gather and process patient details, ensuring claims are processed in half the time and making data reconciliation tasks 65-75% more efficient [13]. By implementing this automation system, this company has observed better operations at a lower cost and satisfied staff.

D. Evaluation Metrics

Error rate, task duration, scheduling accuracy and satisfaction rate of users are core evaluation metrics in this research. These matrices have been assessing efficiency in automation, user impact and reliability in the process. These leads to an effective integration of UiPath, supporting task mining to improve the process.

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IV. RESULTS

A. Data presentation

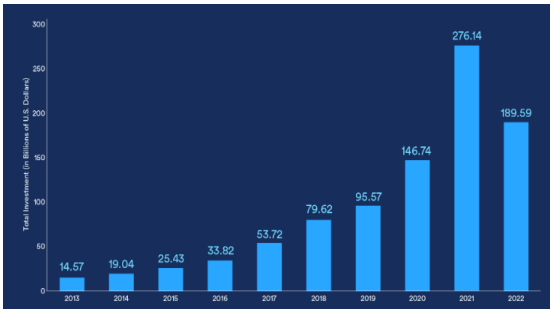

Figure 3: Global Corporate Investment in AI

[14]

As per the figure, global corporate investment, including "mergers/acquisitions, minority stakes, private investment, and public offerings" dropped in 2022 from 2021 highs, however, this number has effectively increased 13-fold in the last decade [14]. "Nuance Communications acquisition" was the biggest investment, where the computer software tech company was approached by Microsoft for $19.7 billion.

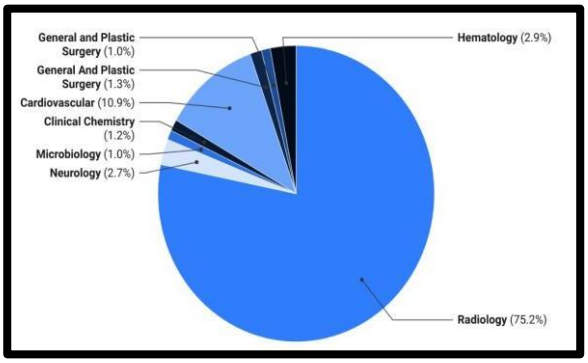

Figure 4: AI-Based Devices in Medical Discipline

[15]

As per the above figure, "Radiology (75.2%), Cardiovascular (10.9%), Haematology (2.9%), Neurology (2.7%), General and Plastic surgery (1.3%), Clinical Chemistry (1.2%), and Microbiology (1%)" were some popular and most used AI-enabled devices in the health and medicine share in 2023 [15]. As per the survey data of Optum, "85% of healthcare executives" think that AI can have a major effect on the sector through 2023.

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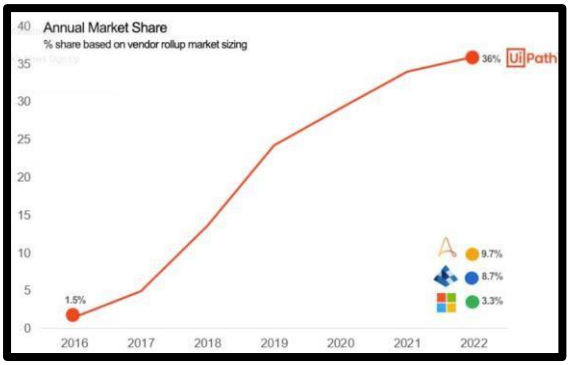

Figure 5: Global RPA Raise

[16]

As per the above figure, UiPath led the growth in the Robotic Process Automation (RPA) market, following the timeline from 2016 to 2022. Beginning with only 1.5% market share in 2016, UiPath soon rose to 36% by 2022 because many were adopting its RPA solutions [16]. Its continuous growth demonstrates that it is performing successfully and leading in innovation. Automation Anywhere earned 9.7%, Blue Prism was given 8.7%, and Microsoft got 3.3% [16].

B. Findings

The findings from the above charts and graphs show that AI and RPA play a crucial role in managing the healthcare industry by analysing the proper scheduling of repetitive tasks and patient care. Global corporate investment in AI was the highest in 2021, with 276.14 billion, and this has effectively dropped in 2022 [14]. Radiology, with 75.2%, has become the most used AI-based device in the medical discipline in 2023 [15]. During the period from 2017 to 2020, UiPath's fast growth proves they made significant investments in growth, development of new products and possible acquisitions, boosting their position in the market [16]. RPA can play a key role in decreasing health resources dedicated to menial admin tasks by efficiently processing the records of patients.

C. Case Study Outcomes

Case Study	***Key Findings***	***Relevance***
Cleveland Clinic	• Automation initiates success and tremendous growth, and improvement in scheduling efficiency [11]. • Finding UiPath consulting or implementation partners is relatively easy, and a major reduction in appointment errors [11].	Improve scheduling accuracy and operational efficiency

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Dexcom	• They have been tracking a 200,000-hour target [12]. • Identified opportunities in automation.	This case study's effective digital transformation and adoption of AI-powered automation have led to significant process developments, increased efficiency, and an effective base for future growth.
Max Healthcare	• This has been making data reconciliation tasks 65-75% more efficient [13].	The relevance of this case study example is validated by the integration of RPA to fasten insurance claims administration across all units of healthcare.

Table 1: Case Study Examples

(Source: Self-developed)

Table 1 shows task mining and UiPath, repetitive work was automated and efficiencies boosted, delays were avoided, and staff were freed up to provide patient care at Cleveland Clinic, Dexcom, and Max Healthcare.

D. Comparative Analysis

Author	***Focus Area***	***Key Findings***	***Limitations***
[5]	Task mining in workflow management	Identifies repetitive tasks for automation [5].	Limited real-world healthcare use
[6]	Process mining in healthcare	Improves workflow, reduces errors	Complex in healthcare settings
[7]	UiPath & RPA in healthcare	Enhances scheduling, reduces manual work [7].	Tool-focused, lacks depth on challenges
[8]	AI in healthcare automation	Streamlines processes, reduces costs	Mostly theoretical, not widely tested

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[9]	Automation & staff efficiency	Frees staff for patient-focused tasks [9].	Lacks role-specific healthcare data
[10]	HIT bundles & hospital performance	Boosts efficiency and outcomes [10].	Less focus on task mining or RPA

Table 2: Comparative Analysis

(Source: Self-developed)

Table 2 highlights task mining, AI, and RPA as ways to improve workflow in healthcare and increase efficiency and decision-making, and there are challenges in real-life implementation, system integration, and high levels of complexity in the healthcare process.

V. DISCUSSION

A. Interpretation of Results

UiPath is a tool that originates from the "Robotic Process Automation (RPA)", which is ready to automate EMR workflows, claims systems, and document management and data transfer, which helps to schedule the operations in the healthcare industry. This also improves the operational efficiency of the healthcare industry by reducing human errors and many other factors. On the other hand, AI also plays a crucial role in the healthcare industry by streamlining workflows, decreasing operational costs, improving diagnostic accuracy, and enhancing patient. Both RPA and AI can help to increase the efficiency of the staff in healthcare by enhancing the internal process system, which improves the efficiency as well [6]. On the other hand, corporate investment in AI has increased the most in 2021, with 276.14 billion supporting its evolving nature. [14]. Figure 5 has highlighted the rise of RPA from 2016 to 2022 increasing from 1.5% to 36% [16]. Radiology has been using the most as an AI-based device in the medical discipline in 2023 in the global AI in the healthcare market [15].

B. Practical Implications

The practical implication of this study also relates to a combination of task mining with UiPath automation being able to automate repetitive, low-value tasks in healthcare scheduling. It is not only that it facilitates administrative burden and operational efficiency, but it also gives patients recourse and quality of service [17]. This will also free staff to devote their concentration to the most essential, faces of patient tasks and thus improve job satisfaction and also care standards. With such intelligent automation systems, data-driven decisions are made with fewer errors and optimised workflows and, therefore, promote sustainable improvements in the delivery of healthcare and staff performance.

C. Challenges and Limitations

Even though the clinical workflow is quite complex and volatile, one of the main challenges when combining task mining and UiPath automation for healthcare scheduling is that the clinical workflow is indeed very variable. Using secondary data, staff behaviours may be shallow, not time sensitive or inaccurate, yet it will be difficult to gain insight into the actual

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staff behaviours [18]. Similarly, processes and quality of the logs, among other factors, influence automation. These limitations highlight the security of complementary data from primary sources and business processes as well as tailored healthcare implementation strategies.

D. Recommendations

The recommendation for improving the effectiveness of task mining is to concentrate on improving the quality and consistency of secondary data sources. When deployed in a healthcare environment, it is highly important to have robust data privacy and compliance in place with one of the most sensitive types of patient information. A second way to increase efficiency and reduce resistance can be through automating to augment how schedules are currently [19]. AutoML tools are effective as they do not require any machine learning or coding experience. Thus, medical professionals can use one or more of these tools to highlight different diseases depending on available datasets of "imaging, lab results, symptoms, medical history" and others [20]. Automation tools and continuous evaluation processes are there to keep healthcare scheduling in digital transformation and avoid errors, but staff training is essential to work alongside such automation tools, especially to reduce errors.

VI. CONCLUSION AND FUTURE WORK

Task mining and UiPath automation are instrumental to improving healthcare scheduling with automation and reducing tasks to save labour and increase efficiency. Integration of these tools makes the workflow straightforward, where the staff, therefore, can give focus of care to the patients, thereby improving the service quality and the operational performance.

Future research will attempt to explore the scalability of task mining in different healthcare settings, considering integration of the system, the use of real-time data and the automation of further applications to optimize the whole healthcare operations.

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