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Effect of the rate of adoption of electronic data interchange on healthcare providers' cashflow management in Kericho County.

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EFFECT OF THE RATE OF ADOPTION OF ELECTRONIC DATA INTERCHANGE ON HEALTHCARE PROVIDERS' CASHFLOW MANAGEMENT IN KERICHO COUNTY

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A RESEARCH STUDY SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE MASTERS DEGREE IN BUSINESS ADMINISTRATION HEALTHCARE MANAGEMENT, STRATHMORE BUSINESS SCHOOL, NAIROBI, KENYA

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Danny Mwendwa Matolo

.... [Signature]

.....24/06/2022..... [Date]

Approval

The thesis proposal has been reviewed and approved by me as the university-appointed supervisor

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Date: 24/03/2023

ABSTRACT

The purpose of this research was to assess the effect of the slow adoption of e-claims on private healthcare providers' cash flow management in Kericho County. Extensive review of existing literature is presented to understand the study area in context. Using the empirical information as well as theory of cash conversion, TAM and RBV theory, the researcher identified dependent (efficiency of e-claim in cash flow management) and independent variables (claim rejection, rate of adoption, reduced operational cost, faster claim settlement) that were tested in the study. The study used a mixed method approach (both qualitative and quantitative research approaches) to collect primary data through a combination of interviews and survey questionnaires in order to meet the set objectives. Thematic analysis, descriptive statistics, and regression analysis were the data analysis tools used. The findings of the study show that claims submitted electronically are processed more quickly, resulting in faster payment and improved cash flow management for private healthcare providers. It was also found that most private hospitals in Kericho county have adopted the use of EDI technology to process e-claims. The results show that although insurance providers may not easily identify fraud, using EDI to detect such occurrences is helpful. With reduced costs, rare inconsistencies, promptly submitted claims, and timely reimbursements, financial reporting becomes easier to process with each billable procedure accounted for. Overall, the study found that the strongest predictors of the efficiency of e-claims in cash flow management are reduced rejection (Mean 3.84), cost-effectiveness, timely payment (Mean 3.72), and reduced fraud (3.95). There was no significant relationship between the slow adoption of EDI and e-claims in cash flow management. Various recommendations are given to direct further studies in an effort to improve the current research.

***Key Words**: EDI, e-claims, adoption, efficiency, cash flow management*

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LIST OF ABBREVIATIONS

AMA	American Medical Association
EDI	Electronic Data Interchange
EHR	Electronic Health Record
EMR	Electronic Medical Record
EOB	Explanation of Benefits
HIPAA	Health Insurance Portability and Accountability Act
NHIF	National Hospital Insurance Fund
RBV	Resource-Based View theory
VAN	Value Added Network

CHAPTER 1:
INTRODUCTION

1.1 Background of the Study

The American Medical Association (AMA) (2013) defines an electronic claim commonly known as an e-claim as a paperless patient claim form generated by computer software and transmitted electronically over a telephone or computer connected to a health insurer or other third-party (payer) for processing and payment. The e-claims are sent through Electronic Data Interchange (EDI) providers. EDI is the electronic interchange of business information that uses a standardized format; a process that allows one company to send information to another company electronically rather than with paper (Union Pacific, n. d). EDI can also be defined as the automated transfer of data between a care provider and a payer. The benefits to care providers include quicker turnaround of information, reduced administrative expenses and avoiding claim processing delays (United HealthCare, 2020). This is due to the fact that once a patient with insurance coverage checks in for an appointment in a hospital and receives service, a medical claim is sent to his or her health insurance firm requesting payment for the service rendered (Beik & Pepper, 2020).

Private healthcare providers' cash flow is the amount of money being transferred in and out of a healthcare organization. With the use of EDI technology to process e-claims, healthcare organizations can track the billing and payment process in a more accurate and convenient way (Beik & Pepper, 2020). The inflow of payments from insurance firms is easily recorded and stored through e-claims as opposed to when physical claim forms are utilized. Researchers have studied how EDI in healthcare can be used to fasten claim settlement, reduce fraud and claim rejection rate as well as minimize operational costs (Chepkwony, 2015; Brange & Duisterhout, 2017; Beik & Pepper, 2020). A higher rate of adoption of electronic data interchange will lead to increased efficiency of e-claim in cash flow management since more claims can be submitted electronically and more claims can be processed in a shorter period of time (Girton & Haupert, 2016).

A study by Brange and Duisterhout (2017) argues that electronic claims shared by healthcare providers to health insurance companies are easier to settle than physical claim forms. General

practice has been patient claims forms are delivered to insurance companies physically once patients have been attended to. Consequently, the institutions incur freight costs, risk of claims possibly getting lost along the way, and delay in the processing of the claim forms for payment (Chepkwony, 2015). The claim settlement process involves collecting pieces of evidence related to the incident of the medical services, comparing with the provisions of the policy guidelines and the benefits payable by the insurer (Sodzi-Tettey et al., 2012). According to Sodzi-Tettey et al. (2012) verified and approved claims are paid to the respective private healthcare providers. However, claims can be rejected for various reasons such as fraud or errors. Claim rejection can lead to delays in cash flow management since the claim needs to undergo adjustment before it can be processed. As such, it is believed that the faster processing of claims due to the adoption of electronic data interchange leads to faster claim settlement, which can ultimately result in improved cash flow management since the healthcare provider does not have to wait for claims to go through the manual process (Derricks, 2021). This means that using EDI to process e-claim can help private healthcare providers easily manage cash flow.

In general, the adoption of electronic data interchange (EDI) by healthcare providers can have a positive effect on cashflow management. EDI enables healthcare providers to quickly and securely transmit claims, authorizations, remittance notices, and other transaction documents electronically (Brange and Duisterhout, 2017). This automated process saves time and reduces errors, shortening the time from billing to payment. By streamlining the administrative processes associated with claims processing, EDI eliminates the need for manual data entry and paper documents, resulting in improved efficiency in payment processing. The improved efficiency of EDI can also lead to increased acceptance of payments, making it easier for healthcare providers to manage their cashflows.

1.2 Definition of Concepts

The following are the key concepts in this research:

Cash flow Management: This refers to the process of managing the inflow and outflow of money for a business, organization, or individual. It includes the planning, budgeting, collection, and disbursement of cash for the purpose of meeting financial goals (Berman, Knight, & Case, 2013).

It also involves making decisions about how to best allocate resources and manage liquidity. Healthcare institutions rely on varied technologies to manage their cash flow. In this study, the focus is the use of EDI technology in cash flow management in private hospitals.

EDI (Electronic Data Interchange): This refers to the computer-to-computer exchange of business documents in a standard electronic format (Union Pacific, n. d). It is a technology used to electronically transmit business information from one computer system to another. It allows for the seamless transfer of data between different organizations and allows for faster, more efficient communication of data, such as orders, invoices, and shipping notices, without the need for manual data entry (O'Callaghan, Kaufmann & Konsynski, 2012). This study is to assess the effect of EDI usage in hospital cash flow management.

E-Claims: These are electronic claims that are submitted electronically to insurance companies for reimbursement. These claims are usually submitted through a secure website and can be processed quickly, reducing costs and paper waste. According to American Medical Association (AMA) (2013), e-claim is a more efficient and cost-effective method than traditional paper-based claims. In this research, the concept of e-claim is used to understand how EDI aids in faster processing of insurance claims as opposed to traditional paper-based claims.

Claim Settlement: This is the process of resolving a claim in which a customer/policyholder has requested reimbursement from an insurance company (Sodzi-Tettey et al., 2012). This can include negotiating a settlement amount and agreeing to a payment plan and the amount of money to be paid by the insurance company to the policyholder. This concepts utilized in this research to understand whether adoption of EDI technology in healthcare affects the rate at which insurance claims are settled. According to Pattnaik et al. (2019), insurers should settle claims fast so that the customer gets the service as promised.

Fraudulent Claims: These are insurance claims that are intentionally dishonest or misleading (Singh, Udmale, Pandey, & Singh, 2021). These claims are submitted with false or exaggerated information in order to receive benefits or a larger reimbursement. These claims are illegal and can result in fines and jail time. A study by Pattnaik et al. (2019) argues that some hospitals collude with the insured and inflate the bill through unnecessary and fake medical procedures. The concept

is used as a variable to understand whether use of EDI technology in hospitals reduce the possibility of fraudulent claims.

Rate of Adoption: This refers to the speed at which a new technology, process, or product is adopted by a population (Taherdoost, 2018). It is a measure of how quickly a new product or service is adopted by a market and can help to identify areas that need improvement. This study aims at assessing the effect of the rate of adoption of EDI on healthcare providers' cashflow management in Kericho county.

1.3 Problem Statement

One of the top challenges to cash flow for healthcare providers is insurance payers. One billing code error and late payment may not seem like a big deal, but over time, they accumulate, and that can make a healthcare provider rely on credit to meet payroll, purchase supplies, and stay operational, and makes it more difficult to meet revenue goals. Compared to the U.S., the healthcare industry in Kenya has been slow to adopt innovative means of sharing patient data like the use of EDI to share e-claims with insurance providers (Grand View Research, 2017).

Research shows that implementation of EDI technologies in claim processing is associated with huge costs, forcing private healthcare providers to end up using traditional paper files to transact with insurers (Chepkwony, 2015). In addition, patients with insurance coverage in Kenya end up spending a lot of time waiting for insurance providers to approve claims while in the hospital (Pattnaik, Misra, & Ghadai, 2019). The problem is more persistent especially when patient data is kept in paper files and the healthcare provider does not have electronic means to share data with the insurer.

Various researchers have also studied the use of EDIs in the healthcare industry identifying its usefulness in medical billing, assistance to physicians, and reduction of medical insurance fraud (Moynihan, 2017; Branger & Duisterhout, 2017; Pepper, 2017; Bennett, 2020; Srinivasan, Kekre & Mukhopadhyay, 2021). A study by Sodzi-Tettey et al. (2012) show that health insurance is faced with various challenges such as incomplete evidence of services provided by Healthcare providers/institutions, overcharging of drugs, wrong diagnosis or mismatch of drugs with

treatment diagnosis, timely submission and processing of medical claims, non-alignment of the professional skills and job requirements thus causing nonpayment of payable claims.

A study conducted in Nairobi by Chepkwony (2015) found that most hospital personnel keep patient information in files that take time to retrieve (delayed claim processing) and is prone to human error. In most cases, insurance claims face delay due to a lack of management information system, medical compliance to fill the medical records, an inadequate number of claim personnel, and the inability of most health institution practitioners to manage claims in a timely manner (Citra & Thabrani, 2018). As a result, healthcare providers end up experiencing delays in claim settlement as the insurer has to verify the claim to avoid repeated claims or fraud, which might also take time (Moynihan & Kibat, 2011). This prolonged process can be improved and the duration of claim settlement reduced through an automated and integrated system like EDI that allows health insurance to communicate with healthcare providers in a timely manner, thereby improving cash inflow monitoring.

However, there is lack of existing research on how EDI is used in Kenyan healthcare centers. The researcher identified the need to assess how the rate of adoption of EDI-powered e-claims affects private healthcare providers' cash flow management using a case study of private healthcare providers in Kericho County. Therefore, this study will investigate whether efficiency in e-claim cash flow management for private healthcare providers is affected by faster claim payment, reduced operational cost, slow adoption, and reduced claim rejection due to repetition, billing errors, or fraud.

1.4 Objectives

1.4.1 Broad Objective

The main objective of this research is to assess the effect of the rate of adoption of e-claims on private healthcare providers' cash flow management in Kericho County.

1.4.2 Specific objectives

1. To examine if the adoption of e-claims can make claim payments faster.

2. To determine if the adoption of EDI solutions can reduce the claim rejection rate (fraudulent, repeated, or rejected claims).
3. To analyze how EDI solutions like e-claims reduce operational costs for healthcare providers.
4. To assess the impact of the slow adoption of e-claims in private hospitals in Kericho County.

1.5 Research Questions

1. How does the adoption of e-claim make fasten claim settlement?
2. How can EDI reduce repetition, rejection, or fraudulent claims?
3. How does the use of EDI reduce operational costs for healthcare providers?
4. What are the effects of the slow adoption of electronic claims by private healthcare providers in Kericho County?

1.6 Scope of the Study

The study will only be focusing on private healthcare providers in Kericho County. The participant in this study will be private healthcare managers, health insurance providers, and EDI providers in Kericho County. The participating private healthcare centers will be expected to have operated in the industry for five years in order to have a better understanding of how their cash flow management technology has evolved with time. The study is expected to take five months, starting from May to September 2022.

1.7 Significance of the Study

Managing cash flow is one of the most difficult aspects of healthcare practice. It appears to be as simple as providing a service and then collecting payment in theory, but in reality, poor planning, insurance paperwork, a large number of abstracted patients, and a lack of employee training frequently result in inefficient collection and cash flow problems. The general significance of this research is to improve the knowledge of healthcare providers on the importance of embracing and

adopting electronic claims because there is a need to consolidate resources regionally especially when it comes to cash flow management technology.

The study will also generate new knowledge on the use of EDI in private healthcare centers, how the technology will influence the turnaround time of payment, help in reducing rejection of claims as well as debt period by insurance, and reduce the number of fraudulent claims that the providers may experience. This will be achieved through the collection of primary data that will offer new information and insights concerning the research area.

Finally, this study is significant to healthcare practitioners who wish to have their workload reduced and their service improved. Collecting the patient deductible and billings on time is a big concern for many healthcare providers, resulting in growing expenses due to uncollectible billings and patient-related issues. Collection efforts are frequently a delicate balancing act between keeping strong patient relationships and effectively communicating that the provider's costs must be met in order to sustain the required level of treatment. Therefore, the findings of the study will help private healthcare providers in Kericho County to manage their cash flow more efficiently.

1.8 Why Kericho county

This is a case study research focusing on Kericho county. The researcher specifically chose Kericho County out of the 47 counties in Kenya in order to have a comprehensive look at how private healthcare providers in the county have adopted EDI in their cash flow management. Besides, there is lack of empirical literature focusing on Kericho County's private healthcare providers and the use of EDI solutions in their facilities. This is why Kericho County was picked in this study in order to gain concrete, contextual, in-depth knowledge about a specific real-world subject. As a result, the findings can be utilized as a basis for making recommendations to private healthcare providers in other counties.

CHAPTER 2:

LITERATURE REVIEW

2.1 Overview

This section presents research on the broader context of how EDI is used in healthcare worldwide and the narrower context of cash flow management in Kericho County. The literature incorporates a brief definition of key research concepts and their significance, the current trends in EDI use in healthcare, an empirical review of the overall concept of cash flow management, operational costs, turnaround periods, fraudulent, repeated, or rejected claims, and the rate of adoption as far as e-claims are concerned in the healthcare industry. The literature also examines a theoretical review of the resource-based view theory, Cash Conversion Cycle Theory and Technology Acceptance Model (TAM). The chapter ends with a conceptual framework showing how the dependent and independent variables relate.

2.2 Current Trends in the Use of EDI in healthcare

To be sure, EDI has been used in healthcare for decades on the payer side for the determination of coverage and benefits verification. In the U.S. the Internet is being evaluated as a medium for streamlining financial and administrative transactions in the health care system. In the U.S., health care is financed largely by a network of third-party payers or entities that insure and pay for health services but are not directly engaged in providing care (Nunn, Parsons, & Shambaugh, 2020). These entities range from government programs such as Medicare and Medicaid, which pay for the care of the elderly and impoverished, to private-sector organizations, including traditional indemnity insurers, self-insured companies, and managed care organizations (Nunn, Parsons, & Shambaugh, 2020). The Internet could be used by providers to submit claims for payment or by individuals to enroll, disenroll, and change their coverage (United HealthCare, 2020). Payers (insurance) could quickly confirm an individual's eligibility for coverage and convey any changes to the health plans, which, in turn, could quickly relay the information to the person's designated providers.

Figure 2.1 shows the U.S. healthcare EDI market by delivery mode from 2014 to 2025. The figure shows the U.S. healthcare EDI market in categories such as Mobile EDI, Web, and Cloud-based EDI, Direct (point-to-point) EDI, and EDI Value Added Network (VAN).

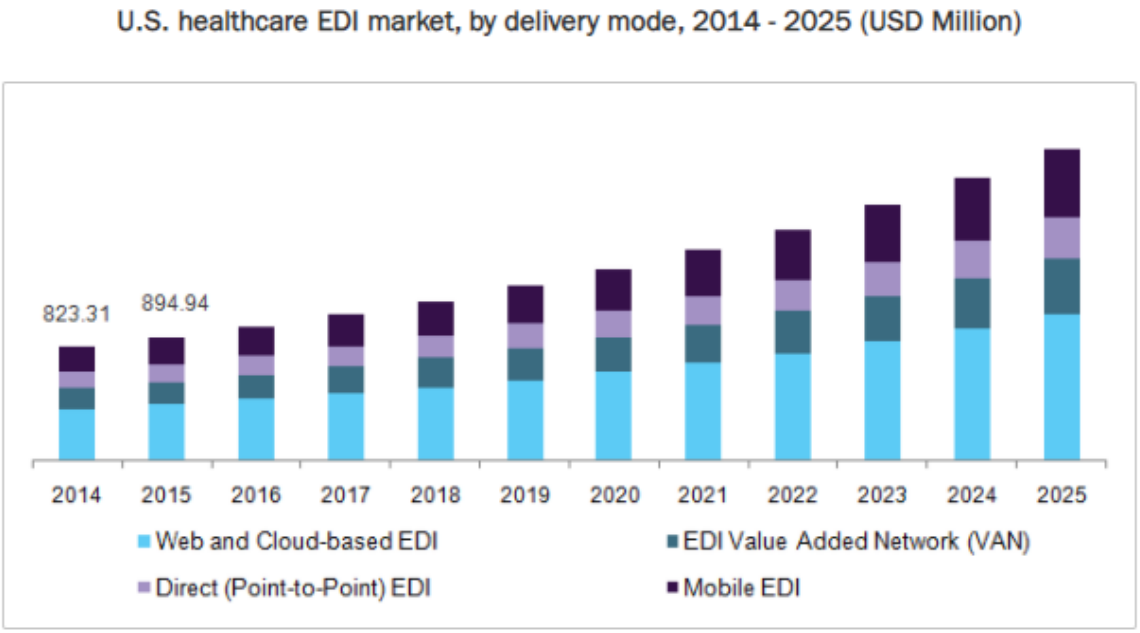

Figure 2.1: The U.S healthcare EDI market from 2014- 2025 (Source: Grand View Research, 2017)

The trend shows exponential growth in the adoption of different types of EDI in healthcare in the U.S. Electronic data interchange helps in keeping healthcare costs at an affordable level, improving the quality of healthcare delivery and its supporting process, and making accurate, fast, reliable, secure, and detailed information (Grand View Research, 2017). The use of paper form can be cumbersome, incompetent, and costlier when it needs to distribute, retrieve, consolidate, and look for data. The electronic data interchange helps in minimizing these kinds of time-consuming processes and streamlines the claim management processes (OpenText Corp, 2017).

In Kenya, there has been a slow adopting of technologies that facilitate faster exchange of patient data in hospitals. According to Chepkwony (2015), the slow adoption of electronic medical records (EMR) has become a critical challenge in the health care industry of Kenya. When it comes to EDI, some Kenyan health insurance firms like Jubilee use Slade 360 EDI which is provided by Savannah Informatics to communicate with providers and automate the processing of claims

between Tunza clinics and Jubilee Insurance (Nyakeri, Samuelsson & Bick, 2022). According to Nyakeri, et al. 2022), Slade 360 has several benefits for providers including reduced claim duration, lower operational costs, reduced claim rejection, and improved customer service.

Despite numerous technological advances, the healthcare industry in Kenya still relies on an enormous amount of paper and manual claim procedures. Chepkwony (2015) found out that in Nairobi, hospitals' data is entered manually and bound to human error. There are cases of files being misplaced or lost altogether. Some patients may not remember their patient numbers and therefore tracing their files is an uphill task (Chepkwony, 2015). There are also therefore cases of multiple entries of case files for patients when files cannot be found. Tracing files is time-consuming and leads to losses in working man-hours. According to Evans (2016), quicker adoption of EMR and other electronic data interchange technologies is necessary to streamline key processes in the healthcare industry, integrate activities across healthcare organizations, reduce overall healthcare costs, improve medical record management, and health program management, and improve patient care quality.

2.3 Theoretical Review

This section presents the theories that were relevant to the study. The resource-based view theory, cash Conversion Cycle Theory and Technology Acceptance Model (TAM) were reviewed. The applicability of these three theories to the study is also discussed.

2.3. 1 Resource-Based View (RBV) Theory

This study adopted the resource-based view (RBV) theory proposed by Wernerfeit (1984) to underpin the moderating variable. The proponent of the theory considers the firm's resources against four characteristic criteria namely valuable, rare, inimitable, and non-substitutable (Madhani, 2010). RBV proposes that firms are heterogeneous because they possess heterogeneous resources, meaning firms can have different strategies because they have different resource mixes. The theory starts from the concept that a firm's performance is determined by the resources it has at its disposal (Lockett, Thompson & Morgenstern, 2009). The way these resources are used and configured enables the firm to perform and can provide a distinct competitive advantage. In this study, this theory explains how hospital resources and characteristics such as e-claim in cash flow

management affect the turnaround time of payment, the number of fraudulent claims, rejected claims, and debt period by insurance among private healthcare service providers. The slow adoption of the EDI solution in e-claim processes hinders many from keeping the cash inflows in a more efficient way.

According to Barney (2001), the RBV draws upon the resources and capabilities that reside within the organization in order to develop sustainable competitive advantages. A resource is any item that can be classified as an advantage or flaw of a particular corporate establishment (Barney, 2001). Besides, firm-based resources may be tangible or intangible. Such entail machinery, efficient procedures and organizational processes, business contacts, knowledge, capital, brand names, skilled staff, firm attributes, and assets such as factory building (Lockett, Thompson & Morgenstern, 2009). Since the study is trying to establish if e-claims or EDIs (considered as the resources in this study) could play a role in reducing the turnaround time of payment, the number of fraudulent and rejected claims, and the debt period by insurance among private healthcare service providers. The theory was the most appropriate since it considers the firm's resources in its competitiveness.

2.3.2 Cash Conversion Cycle Theory

The theory propagated by Gitman (1974), predicts that the cash conversion cycle and financial performance are positively related. The cash conversion cycle is a measure of how long cash is tied up in working capital. It quantifies the number of days it takes a company to convert cash outflows into cash inflows and, therefore, the number of days of funding required to pay current obligations and stay in business (Ndirangu, 2017). This theory allows a business to recognize the amount of cash needed. This duration represents the time interval between the purchase of raw materials and the selling of finished goods. With the proper review of its cash conversion cycle, a business is in a position to know the required changes needed to significantly impact its performance. The theory posits that a shorter cash conversion cycle period demonstrates that a business has few resources which can significantly influence performance (Muthiani, 2011). On the other hand, a longer cash conversion cycle implies that sales growth is high which can imply better returns and financial performance.

This theory was suitable for this study as it will allow the researcher to meet two study objectives concerning the turnaround time of payment and debt period after a claim is launched. A study by Wanjuki, Githui, and Omurwa (2021) found that the cash conversion cycle has a positive and significant effect on the financial performance of private hospitals. In addition, cash management practices were found to enhance the financial performance of the private hospital, which encourages investment in cash management technology to improve the accuracy and efficiency of cash flow management and allows the staff to focus on other things. As such, this theory will also assist the researcher to argue on the importance of EDI technology in the efficient management of private hospital cash flows.

2.3.3 Technology Acceptance Model (TAM)

TAM is an information system theory that modelled how users came to accept and use a technology (Alagoz & Hekimoglu, 2012). TAM is a freestanding model that reasons about user intentions to use a given technology and how users perceive the effectiveness and ease of use. These attitudes then drive users' intentions to use the technology (Alagoz & Hekimoglu, 2012). This theory is useful in this study as it helps to evaluate the factors that influence adoption and use of EDI in hospitals. The model is useful for understanding the impact of EDI technologies in hospitals and understand user adoption and acceptance. Two key elements of TAM are perceived usefulness and perceived ease of use (Silva, 2015). The TAM model suggests that only when users perceive both the usefulness and ease of use of the technology will they be fully motivated to adopt the technology

Perceived usefulness: This is a measure of how effective the technology will be in helping a user achieve goals (Silva, 2015). In the case of EDI technology, users (healthcare providers) must perceive that the technology can help them to save time and money while improving efficiencies within their organization. Research shows that EDI technology is a useful tool for healthcare cashflow management as it enables faster and more efficient cross-organizational communication than manual processes (O'Callaghan, Kaufmann & Konsynski, 2012). This can reduce the time it takes to process payments, update accounting records, and manage financial activities. EDI technology also removes much of the manual labor and paperwork associated with manual

cashflow processes, reducing costs and improving accuracy (Fiaidhi, Mohammed & Mohammed, 2018).

Perceived ease of use: This refers to how easily the user can access and make use of the technology (Silva, 2015). If an EDI system is complicated and difficult to set up, the user will be less likely to adopt it. The perceived ease of use of EDI technology in healthcare cashflow management can vary depending on a variety of factors. Some EDI systems are user friendly and have easy-to-navigate interfaces, while others may require additional training and processes to be effective (Peffers et al., 2020). Implementing EDI also requires strong administrative and technical support, and the resources available to the healthcare organization may present challenges to adapting EDI technology (Peffers et al., 2020). Additionally, integrating EDI technology into an existing healthcare system can be a complex and lengthy process.

2.4 Empirical Review

2.4.1 Cash flow management

Cash flow management is the process of monitoring, reviewing, and regulating a company's cash flows (Kiana, 2010). The statement of cash flows shows a company's ability to generate cash from operations, maintain and develop its operational capacity, meet its financial obligations, and pay dividends over a period of time (Reeve, Warren & Duchac, 2009). Premiums, investment income, capital injections, policy excess, salvage sales, and reinsurance recoveries are all examples of cash inflows for a general insurance firm. Cash flow problems can arise for a variety of causes, including large claims, among others. According to Kiana (2010), claims payment accounts for the highest percentage of a company's payments, and it is the one that suffers the most when cash flow is tight. As a result, if a company is experiencing cash flow problems, the item most likely to be impacted is claims payments.

2.4.2 Faster claim payment/turnaround period

In terms of the payment process, increased efficiency and accuracy combine to deliver providers their money at a quicker pace. EDI in healthcare improves the billing process and decreases rejections (United HealthCare, 2020). The effect of this is extended into how soon a payment gets

through. The adoption of an integrated EDI system enhances clean claims, reducing time wasted resubmitting rectified rejections, and minimizing the distance between providers and their pay-outs (Branger & Duisterhout, 2017).

2.4.3 Claim rejection rate (Fraudulent, repeated, or rejected claim processing)

Healthcare is expensive all across the world, thus many people cannot afford to receive the care they require (Thomson, Cylus, & Evetovits, 2019). It is critical to have a health insurance plan in place to cover unexpected medical expenses. An insurance claim is a request for financial assistance from the insurer by the policyholder. In general insurance, claim settlement is only granted when the proper procedures have been followed (Pattnaik, Misra, & Ghadai, 2019). Insurance firms must provide a simple claim settlement process in order to stay competitive. According to Amruthamma and Aswathanarayana (2018), insurance claims are classified as either cashless or reimbursement.

With a cashless claim, a patient will not be responsible for any medical expenses, as the insurance company would cover all of them (Amruthamma & Aswathanarayana, 2018). Customers prefer cashless health insurance policies with more network hospitals. On the other hand, reimbursement claims occur when the insured is not treated in a network hospital (Anchan, Jathanna, & Marla, 2011). In this case, the insured is responsible for all expenses, which are eventually reimbursed by the insurance provider. Reimbursement claims can take longer since the insurance company wants documentation before the customer is reimbursed.

Both types of insurance have different settlement processes. In a cashless claim process, the individual must notify the insurance company in advance of a planned hospitalization or shortly after admission if the hospitalization is unexpected (Amruthamma & Aswathanarayana, 2018). In addition, a pre-authorization form must be completed in order to obtain approval for the treatment and to assist the company indirectly in settling the bills. The bill settlement in a reimbursement claim, on the other hand, requires people to cover their own expenses during treatment, and hospital invoices must be presented to the insurance company for review before the claim is reimbursed (Anchan, Jathanna, & Marla, 2011). When comparing the two types of health insurance plans accessible, the cashless claims settlement is the greatest option because it relieves the insured

of financial obligations. They may receive care without reluctance and without having to worry about money, even in an emergency. As Kaplan and Porter (2018) claims, one of the main reasons why reimbursement claims are less popular than payment claims are that few people have large sums of money on hand to pay for their own healthcare bills.

Fraud is defined as a deliberate act done with the intent to deceive (Kiana, 2010). A claim is considered fraudulent if the insured makes false claims of fact in his claim or makes statements knowing they are untrue or not thinking they are true or makes statements recklessly without regard for whether they are true or false (Kaplan & Porter, 2018). Applicants, policyholders, claims, service providers, agents, brokers, and corporate personnel are all guilty of insurance fraud. It can happen during the buying, utilizing, and underwriting of insurance policies, and it is usually motivated by greed or financial distress. According to Bennett (2020), the insurer has a right to decline a claim if fraud is proved, as it amounts to a breach of one of the basic principles of insurance, the principle of Utmost Good Faith. Belay (2018) note that fraud can take a variety of forms, including the inflation of a genuine claim, creating an entirely fictitious event, and causing deliberate as opposed to accidental damage to insured property. The main motive of insurance fraud is financial gain.

Insurance companies will continue to lose money as long as hospitals conspire with customers to fabricate claims, particularly when a patient wants to bring a non-covered relative to be treated, and when hospitals submit bogus claims (Bennett, 2020). Some hospitals even file claims for operations that were never performed, which is considered fraud. When insurance firms deny patients their legitimate access to treatment even though they have paid premiums for the treatments, this is considered fraud. A study conducted by Muiruri (2014) concluded that fraud, delays in premium collection, claims management, and information technology are the main factors affecting the provision of medical insurance in Kenya.

2.4.4 Operational costs

Electronic data interchange has different benefits in healthcare that is, cost-saving which helps in removing all paperwork that digitizes all the exchanges, allowing Electronic Data Interchange healthcare transactions to result in cheaper operating costs when processing healthcare papers.

Healthcare providers can save a lot of money by using Electronic Data Interchange. Moynihan, (2017) indicates that standardization generates the Health Insurance Portability and Accountability Act's (HIPAA's) goal in implementing Electronic Data Interchange to create national and international standards for electronic healthcare transactions. HIPAA Electronic Data Interchange transactions make it possible to share healthcare data in an organized, compliant, accurate, and efficient manner. HIPAA Electronic Data Interchange standards, on the other hand, aren't just for patient transactions or health data transmission. In healthcare, Electronic data interchange helps in faster processing that patients, as well as healthcare professionals and institutions, gain from electronic data exchange. HIPAA gave patients the right to access their medical records, which was an important outcome. Electronic Data Interchange transactions assist patients in particular since they expedite the claims and benefits process (Woodside, 2017).

Medical billing essentially involved, several levels of procedures, standards, and formalities that must be followed properly (Derricks, 2021). According to Liu et al. (2011), any faults in any of the steps listed above might cause delays that can harm the patient's health or cost the provider a lot of money. Due to the introduction of electronic data interchange, healthcare providers had to deal with a surprising quantity of documents, mountains of paperwork, and many claims that were either returned or refused. However, because it is electronic, a healthcare EDI improves data interchange and significantly minimizes the time it takes for information to be sent (Peffers, Dos Santos & Thurner, 2020).

Girton and Haupert (2016) say that most importantly, it provides complete data protection and can guarantee a high level of data integrity. The best aspect is that an EDI decreases claim processing delays, which is great for both patients and providers (Derricks, 2021). Standardization is critical to avoid becoming involved in the complexity of services, tests, and billing methods. The medical billing process begins with a request from a healthcare provider and ends with an insurance payer's analytical response (Derricks, 2021).

Another important advantage of electronic data interchange in healthcare is error identification (OpenText Corp, 2017). The manual claims process is filled with error-prone operations that lead to costly denials and time. The adoption of EDI in healthcare increases the dependability, or accuracy, of the information that is being transmitted. An automated error identification tool stops

mistakes in their tracks before they are even uploaded (OpenText Corp, 2017). These errors could include duplicate data entry, illegible handwriting, lost faxes/mail, keying errors, and more. An EDI system ensures that information is accurate upon initial access (Moynihan & Kibat, 2011). Not only this also guarantees that the prerequisites that are necessary for a transaction to occur are completed before being delivered. This tool automatically checks for HIPAA and payer standards at the vendor, clearinghouse, and payer levels, minimizing the likelihood of rejection along the way.

Not only do efficiency and accuracy contribute to prompt payments, but they also lead to considerable cost savings (Derricks, 2021). Manual paper claims are costlier simply because they include a lot more overhead. Providers have to purchase paper, ink, supplies, envelopes, and more as well as recruit extra personnel to compensate for the billing demands of their practice. Not only this, but they lead to additional rejections which may cost providers thousands of dollars each year (Pepper, 2017). EDI in healthcare gives cost-effectiveness that is not achievable without such technology. With fewer rejections, the elimination of paper procedures, and lower personnel expenses, providers can save an astounding amount on each claim they process while boosting their income.

2.4.5 Rate of Adoption of EDI/e-claims

The rate of adoption of EDI-powered e-claims depends on various factors and among the most important are the implementation cost and having a compliant EDI. In recent years, the law has become very important with the cyberattacks and ransomware attacks on healthcare insurers and providers (Seh et al. 2020). The following must be considered for Health system EDI to be compliant:

Appropriate System Design

According to Hart and Saunders (2017), it is critical to have a trustworthy system structure. It can be built from scratch or enhanced from an existing system to ensure data security. It means that users should be able to save, view, edit, and update data without risking its integrity (Hart & Saunders, 2017). The more patient data a healthcare company handles, the greater it becomes. As a result, the system must be enabled to help employees easily access information systems to keep

records up-to-date following the most recent consultations, scans, tests, diagnoses, and prescriptions (Song et al., 2010). The structure should also incorporate proper data backups and security. This is critical in the event of a system failure, calamity, or cyber-attack that compromises the data (Bluh, 2015). Furthermore, if a healthcare EDI fails to safeguard data integrity, it will influence patients' long-term health. The speed of the transactions is the most critical feature of an EDI, and it must ensure that requests and responses are delivered quickly.

Communication Privacy

Encryption is the greatest way to ensure that transactions communicated through an EDI are secure. Massetti & Zmud, (2016) states that all healthcare professionals must utilize it, according to the current standards, and digital encrypted solutions assure the integrity and confidentiality of patients' information. Attackers will be unable to extract anything from encrypted communications if they are caught. The encryption ensures that the information being transferred can only be read by the user at the recipient's end of the system (Massetti & Zmud, 2016).

Securing and Protecting Health Information

Liang et al. (2014) claim that to acquire EDI compliance, you must go through a lengthy process. A technology partner must have domain understanding, as well as digital security and, most importantly, developments. If you are a senior healthcare executive, you will need to find the ideal company to partner with to achieve EDI compliance. Check to see if the company has a proven track record and prior industry experience. Cross-domain competence in system development, cybersecurity, health technology, and policy is also promising. You must be careful in your endeavor because it will have a huge impact on your company (Seetharaman, Sreenivasan & Murugeson, 2016).

Restricted Access

According to Craig et al. (2015), this is one of the most basic methods for securing digital assets for businesses of any size. Restriction of access to sensitive information to a small set of employees is a simple guideline. This ensures accountability and audit trails that show who has access to what data and for what reason. Employees can be classified as a user, expert users, administrators,

providers, etc. It guards against unwanted access to data, whether direct or indirect. Wrigley, Wagenaar, and Clarke, (2014) indicate that as a result, each user will only be able to view information that they are authorized to see. Furthermore, each user type has different permissions to deal with the data. A regular user will not be able to update the data, but a super-user or administrator may.

2.4.6 E-claim Efficiency

Electronic data interchange provides security in healthcare. He technology allows for safe data transfer between healthcare providers and payers or insurance. Because Electronic Data Interchange permits secure data transmission, as required by HIPAA requirements, these healthcare transactions are now more secure. O'Callaghan, Kaufmann & Konsynski, (2012) states that only authorized individuals can access Electronic Data Interchange transactions in healthcare, allowing for secure healthcare data management and access.

Electronic data interchange also helps in improving the productivity of healthcare. It promotes productivity by allowing high levels of accuracy, efficiency, and speed in healthcare transactions. Errors are reduced because human intervention is limited. Manual data errors, shipping errors, billing address errors, and other issues are reduced when using electronic data interchange (Girton & Haupert, (2016). Due to the usage of electronic attachments, which speed the process, Electronic Data Interchange has shown to be an effective tool for insurance claim paperwork. Electronic Data Interchange has resulted in fewer rejections and work demands for healthcare providers and payers. Furthermore, numerous buyers can be served at the same time (Fiaidhi, Mohammed & Mohammed, 2018).

Decreased administration costs is also another benefit of Electronic data interchange to healthcare (Girton & Haupert, 2016). Patients deserve undivided attention from their doctors, and an integrated EDI solution can help them obtain it. An EHR partner that delivers EDI in healthcare helps reduce the load rather than wasting important provider time on manual claims handling. Hutchison et al. (2016) say that this solution eliminates the need for a provider and his or her staff to print, sort, stuff, and mail their claims. This approach not only increases the risk of human mistakes but also increases the possibility of a claim being denied. Providers may know that their

data is accurate without having to bend over backward if they use an automated solution. They can give their patients the attention they deserve. To ensure that physicians have all they need to expedite their billing process and restore their focus to their patients, an EHR vendor worth partnering with should include an EDI clearinghouse partner (Ferenc, 2013). Through each step of the process, EDI technology has the potential to revolutionize the world of healthcare billing. Apex EDI ensures quick processing, quick payments, high-quality results, exceptional service, cloud services, and a simple user interface (Branger & Duisterhout, 2017).

Normally, medical billing is a process that must be followed to ensure effective revenue management (Nearterm, 2018). As illustrated in Figure 2.2, the process of medical billing is a cycle that starts when a patient registers with insurance and gets an appointment.

Figure 2.2: Revenue Cycle Management in Healthcare (Source: Nearterm, 2018).

As the figure (fig 2.2) shows, medical billing and e-claims do not only include just patient collection issues but also other factors like costs and efficiency of claim submission. Health institutions must pay salaries monthly, operating expenses, and other overheads incurred and which if payment delays create serious cash flow problems. The management of healthcare providers needs to be able to estimate their cash flow projections to ensure smooth operations, hence the importance of a revenue cycle management system. To ensure healthcare providers are always solvent and the cash flows run smoothly to ensure timely treatment, e- claim submission and speedy payment have to be factored in. Unfortunately, many healthcare providers have a challenge with the timely submission and processing of medical claims (Citra & Thabrani, 2018).

Electronic data interchange is also beneficial to healthcare since the time it takes to file and process a claim is greatly reduced when using EDI (Holland, Lockett & Blackman, 2013). Most EDIs will not only assist you in identifying potential errors in the claim to be filed, but they will also aid in processing by providing real-time feedback on the claim's submission. Healthcare claims can be processed faster because of this.

EDI dramatically minimizes the amount of time it takes to file and process a claim. Not only will most EDIs aid you to discover any issues within the claim to be filed, but they will also assist in the processing by giving real-time feedback regarding the claim's submission (Ferenc, 2013). Efficiency enables healthcare claims to be handled quicker, so providers may be reimbursed for services performed more rapidly with EDI software. Srinivasan, Kekre, and Mukhopadhyay, (2021) state that efficiency means providers can get paid for services performed more rapidly with EDI software. Kiana (2010) cites that an insurance company is usually rated according to its speed and efficiency in the settlement of claims. Most companies usually advertise how they are able to settle their clients' claims promptly. A company that would want to attract and retain customers must build its competencies around the effective management of claims. This is the reason why the Claims Department receives a lot of attention at the Corporate and Board levels as it plays a very big role in the push for settling of e-claims to HealthCare providers fast to strengthen their cash flows (Mosadeghrad, 2014).

For physicians, EDI offers increased security and privacy protections for healthcare claims processing (Ferenc, 2013). The HIPAA of 1996 safeguards patients' privacy and establishes restrictions as to whom medical data may be published. EDI decreases the danger of information oversharing when it comes to medical records and healthcare claims filings. For example, conventional information exchange via paper claims delivered through the postal system, or information emailed to an individual, raised the risks of unneeded individuals coming into touch with private information (Pepper, 2017). While these persons may have the authorization to handle this information, it is inefficient and insecure.

EDI, on the other hand, especially interfaces with a health management system inside your healthcare practice to decrease information handling during claims processing (Mosadeghrad, 2014). Instead of sending patient information from person to person (or email to email), the EDI

software sends the documents via a securely connected system that is based on properly programmed transactions (OpenText Corp, 2017). These transactions can only be seen and processed by another EDI system that can understand the specified formatting of these coded documents. This capacity to transmit documents and information across EDI software that only accepts particular codes protects the security of patient information and healthcare claims through each stage of the process.

Besides, the manual claims process is filled with error-prone operations that lead to expensive rejections and time (Mosadeghrad, 2014). The adoption of EDI in healthcare enhances the dependability, or correctness, of the information that is being transmitted. An automatic error detection tool stops errors in their tracks before they are even uploaded. These mistakes could include duplicate data input, illegible handwriting, and lost faxes mail, keying errors (Beik & Pepper, 2020). An EDI system guarantees that information is correct at initial access. Not only this also assures that the prerequisites that are essential for a transaction to occur are fulfilled before being delivered. This program automatically checks for HIPAA and payer standards at the vendor, clearinghouse, and payer levels, minimizing the chance of rejection along the process.

In addition, patients need their provider's undivided attention, and an integrated EDI solution may help them obtain it. Rather than spending important provider time on manual claims handling, an EHR partner that provides EDI in healthcare may reduce the strain (Pai et al., 2021). This solution offers an environment where a provider and their team no longer have to print, sort, pack, and send their claims. Not only does this approach raise the chance for human mistakes, but it also heightens a provider's probability of a returned claim. With an automated solution, suppliers can trust that their information is correct without having to bend over backward (Branger & Duisterhout, 2011). They can return that much-deserved focus to their patients. An EHR vendor worth working with has to enlist an EDI clearinghouse partner to make sure doctors have all they need to expedite their billing process and restore their attention to their patients. EDI technology gives the chance to enhance the healthcare billing industry at each stage of the process (Ferenc, 2013). Apex EDI provides rapid processing, fast payments, excellent results, exceptional service, cloud services, and an easy-to-use interface. Built for practices of all sorts, these advantages are not oriented toward anyone's expertise.

2.5 Conclusion and Research gap

This chapter began with a review of theories underpinning the study that viewed the use of EDI technology in private hospitals' cash flow management in Kericho county through resource-based theory and cash conversion cycle theory. Using the resource-based theory, EDI technology in hospitals was taken as a key resource that can improve the institutions' performance in managing cash flow. On the other hand, the cash conversion cycle theory argued how cash management practices enhance the financial performance of the private hospital, thereby encouraging investment in cash management technology to improve the accuracy and efficiency of cash flow management. In addition, an empirical review of various concepts as they relate to cash flow management and EDI in hospitals was discussed.

The empirical review shows that a significant number of studies have been conducted on the use of EDIs in the healthcare industry (Moynihan, 2017; Branger & Duisterhout, 2017; Pepper, 2017; Bennett, 2020; Srinivasan, Kekre & Mukhopadhyay, 2021). The literature indicated various benefits of EDI in healthcare in terms of how it is useful in medical billing, assistance to physicians, and reduction of medical insurance fraud. The literature also found that health insurance is faced with various challenges such as incomplete evidence of services provided by Healthcare providers/institutions, overcharging of drugs, wrong diagnosis or mismatch of drugs with treatment diagnosis, timely submission and processing of medical claims, non-alignment of the professional skills and job requirements thus causing nonpayment of payable claims (Sodzi-Tettey et al., 2012). The table below shows a summary of some literature that the current study basis its argument:

Table 2.1: Research gap summary

Author	**Approach/methodology employed**	**Key findings**	**Research gaps**
Sodzi-Tettey et al., 2012	Qualitative and quantitative approaches were used for primary data collection using interview guides and checklists.	1% rejected claims; 89% Total Reimbursement Rates; and 86% Total Timely Reimbursement Rates	It is a case study of Ghana.
Muiruri, 2014	A descriptive survey design: semi-structured questionnaires	Fraud, cost of health care, and lack of knowledge on medical insurance are the major	Focuses on the Kenyan healthcare industry as a whole.

		challenges in the provision of health insurance in Kenya	
Branger & Duisterhout, 2017	Baseline study, measurements on EDI message flow, and recording GPs' experiences with EDI.	GPs using EMR worked more efficiently with EDI than their colleagues not using EMR	Fails to evaluate to what extent EDI improves the quality of care.
Citra & Thabrani, 2018	Trend analysis of the secondary claim data.	60% of claims were paid within one month of claim submission. delays in claim settlements were caused by non-compliance of doctors to complete medical records, incompetence coders, and inadequate management information systems.	No primary data. It is a case study of Indonesia.
Peffers et al., 2020	Field experience for six months with different firms (in manufacturing, health care, and retailing industry) on what motivated EDI adoption.	EDI adoption motivations included cost savings, faster delivery, improved logistics, higher sales, reduced inventories, and closer relationships with customers.	It does not focus on the healthcare industry alone. It concentrates on U.S and German organizations

As shown in Table 2.1, previous studies fail to show electronic data interchange impact cash flow management in private hospitals. To address this gap, this study will explore the effect of e-claims on private healthcare providers' cash flow management specifically in Kericho County. The study will be looking at key variables such as e-claim in cash flow management, turnaround time of payment, number of fraudulent claims, rejected claims, and debt period by insurance.

2.6 Conceptual framework

The conceptual framework guiding the study is shown in Figure 2.3. There are one dependent variable and four independent variables. The dependent variable for the study is the efficiency of e-claims in cash flow management while the independent variables include faster claim settlement, reduced claim rejection, operational costs, and rate of adoption.

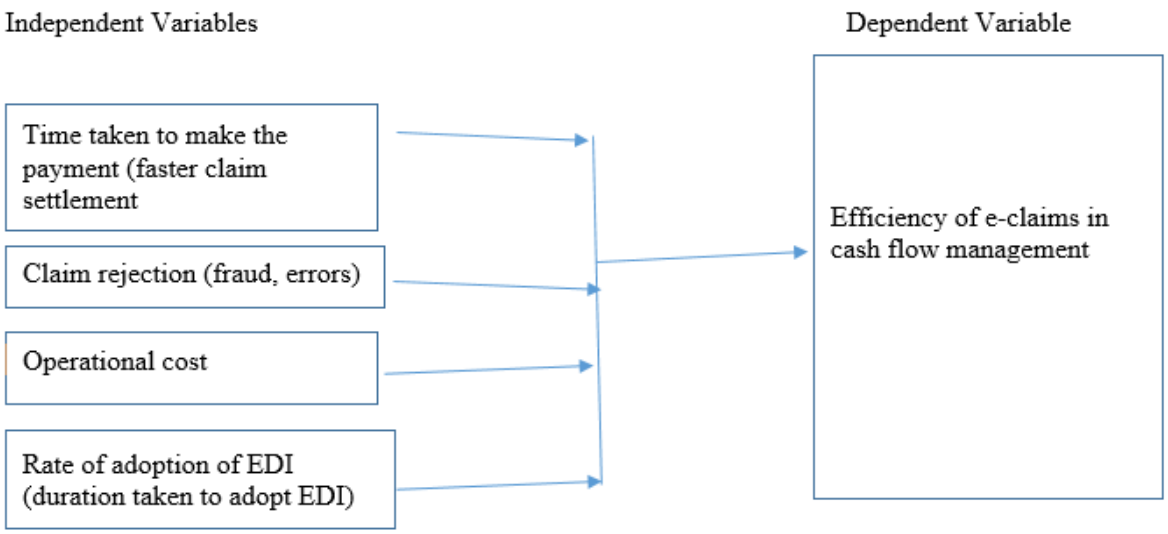

Figure 2. 3: Conceptual Framework

The variables have been drawn from the empirical review as well as the three theories underpinning the study. Technology Acceptance Model (TAM) explains the rate of adoption variable as well as the efficiency of e-claims in hospital cash flow management. The cash conversion theory is used to show the relationship between the turnaround time of payment and debt period after a claim is launched, therefore determining the effect of EDI technology in the efficient management of private hospital cash flows. The RBV theory has been considered in coming up with the "rate of adoption" variable and the expected benefits like reduced operational costs. Using the RBV theory, EDI technology in hospital cashflow management is considered as the resources in this study, which could play a role in reducing the turnaround time of payment/claim settlement, the number of fraudulent and rejected claims, and the debt period by insurance among private healthcare service providers.

2.7 Operationalization of the variables

Table 2.2: Operationalization of the variables

	Variable	**Measurement**	**Source**
Dependent	The efficiency of e-claims in cash flow management • Claim submission accuracy	Likert scale	Hutchison et al. (2016) Moynihan & Kibat (2011) Peffers, Dos Santos & Thurner (2020).

	• Time saved in processing claims through EDI technology • Medical billing mistakes • Revenue or loss		
Independent	Faster payment • Time spend to approve claims (less than 30 days) • From when a claim is lodged • Debt settlement period	Likert scale Interview transcribed data	Sodzi-Tettey et al. (2012) Wanjuki, Githui, and Omurwa (2021)
	The number of fraudulent, repeated, or rejected claims • Number of fraudulent claims • Lost insurance money (Amount) • Number of e-claim rejection • Cost of e-claim rejection	Likert scale	Bennett (2020) Belay (2018) Muiruri (2014). Fiaidhi, Mohammed & Mohammed (2018) Beik & Pepper (2020)
	Reduced operational costs	Interview	Girton & Haupert, (2016)
	Slow adoption	Interview	Chepkwony (2015) Hart & Saunders (2017)

CHAPTER 3:

RESEARCH METHODOLOGY

The purpose of this study was to assess the effect of the rate of adoption of electronic data interchange on healthcare providers' cashflow management in Kericho County. To meet this objective, the following methods and procedures will be followed:

3.1 Research Philosophy

Research philosophy is associated with the assumption, knowledge, and nature of the study. It deals with the specific way of developing knowledge. This study will adopt a pragmatism research philosophy. This philosophy can integrate more than one research approach and research strategies within the same study. The philosophy can integrate the use of multiple research methods such as qualitative, quantitative, and action research methods (Dudovskiy, 2016). The researcher will use a combination of methods necessary to find answers to research questions or advances current research in the best possible manner.

3. 2 The Research Design

This research employs the case study design. A case study is an in-depth study of a particular research problem, often used to narrow down a very broad field of research into one or a few easily researchable examples (Mills, Durepos, & Wiebe, 2009). The case study research design is also useful for testing whether a specific theory and model actually applies to the phenomena in the real world. EDI is used by many healthcare providers across the globe, but this study specifically narrows that down to understand the effect EDI has on private healthcare providers' cash flow management in Kericho county. Having reviewed empirical literature from the past, there was no single study focusing on Kericho County's private healthcare providers and the use of EDI solutions. This is why Kericho County was picked in this study in order to gain concrete, contextual, in-depth knowledge about a specific real-world subject. Private hospitals were also picked as a way of narrowing down the study to a specific area and achieving concrete results. Private hospitals in Kenya are health facilities that are owned and run by private sector entities and are usually geared towards profit-making.

The study utilizes a mixed method approach (qualitative and quantitative methods). While a qualitative research design is concerned with establishing answers to the whys and how's of the phenomenon in question, the quantitative design will help in establishing cause- effect relationships among the dependent and independent variables (Creswell, 1999). The mixed method of research has been chosen to allow the researcher gain an in-depth understanding of the research topic. It is a method expected to further provide a balanced view reflective of the dataset by obtaining a well-rounded view of the research topic. According to Zikmund (2010), qualitative methods provide information and interpretation on a more meaningful level, while quantitative methods can be used to provide insight into the larger research sample. As a result, combining the two methods can provide an overall more accurate picture of the research and ensure an unbiased view of the study area.

3.3 Population and sampling

Population

A population is an entire group that a researcher wants to draw a conclusion from while the sample is a specific group from which the researcher will collect data (Majid, 2018). Kericho County prides itself in hosting several hospitals that offer different healthcare services. There is also health service provider like health insurance and EDI providers within Kericho county. The population in this study is more than 100 private healthcare providers in Kericho county. In pursuance of Section 184 of the Insurance Act of Kenya, there are 32 Medical Insurance Providers authorized to transact insurance business as of the year 2020 (Insurance Regulatory Authority, n. d). The study will also target a population of 5 EDI providers. The total population of the study will be 137.

Sampling

A sample is a specific group from which the researcher will collect data (Majid, 2018). A sample of (n) 102 participants will be selected using the convenience sampling method. Convenience sampling is a non-probability sampling method in which individuals are selected for a data collection process simply because they are conveniently available (Stratton, 2021). In convenience sampling, the sample usually consists of individuals who are easy to access or approach, such as people who are in the same location, people with whom the researcher has a prior relationship

(Edgar & Manz, 2017). Therefore, convenience sampling was suitable for this study as it is a quick and easy method of obtaining participants with the desired characteristics. The study sought to find out the effects of the rate of adoption of electronic data interchange on healthcare providers' cashflow management in Kericho County, and convenience sampling allowed the researcher to quickly identify participants who fit the criteria for the study. This method of sampling allowed the researcher to get the data needed in a timely manner and helped to easily capture the opinions of the target population.

The total population of 137 is samples using the Slovin's formula to determine the sample size The formula is as follows: sample size = (population size / (1 + design effect)) * (precision / confidence interval). The sample size calculated using Slovin's formula is the minimum number of responses to achieve accurate results. The population size is the total number of people or things that the survey will include. The precision is the desired level of accuracy, such as a 95% chance of accuracy. The confidence interval is the range of values that reflect the accuracy of the survey results. Finally, the design effect is a constant used to adjust for potential distortions in the sample, such as non-response bias. Assuming a margin of error of 0.05, Slovin's formula is used to determine the sample n = N / (1 + Ne^2).

Where;

n = the sample size

N = the population size (137)

e = the margin of error as decided by the researcher (0.05)

Therefore:

$n = 137 / (1 + 137 \times 0.05^2)$

$n = 137 / (1 + 137x\ 0.0025)$

$n = 137 / (1 + 0.3425)$

$n = 137 / 1.3425$

$n = 102$

Convenience sampling is a type of nonprobability sampling in which people are sampled simply because they are "convenient" sources of data for researchers (Dudovskiy 2016). This sampling technique will be used because it will allow the researcher to obtain data from a conveniently

available sample. The 102 participants will be chosen from private healthcare providers (hospitals), health insurance, and EDI providers in Kericho county. The participants will be senior managers in every organization.

3.4 Data collection methods

According to Russell et al. (2015), a researcher using a case study design can apply a variety of methodologies and rely on a variety of sources to investigate a research problem. This study will combine different approaches (mixed method approach) to data collection to investigate the effect of EDI on private healthcare providers' cash flow in Kericho county. All the participants in the study, both in interviews and questionnaire), will be selected based to their availability (convenience).

First and foremost, the researcher will do a survey by use of questionnaires for service providers in Kericho county to find out the effect of EDI concerning cash flow with specific objectives by; the checking period from the e-claim was lodged and when it was paid to the provider. Secondly, the researcher will also liaise with service providers to determine if there has been an increase or decrease in the time spent for a claim to be honored. Through EDI providers, you can track the progress of a claim lodged into the system to the time of payment, pre-audit claim fields automatically for potential errors before submission to a payer, identify claim issues, and provide online claim resolution before processing by a payer.

Thirdly the researcher will conduct interviews with senior managers of health insurance and EDI providers. This exercise will help provide data that shows if there are timelines on their end in regard to when an e-claim should be processed (Citra & Thabrani, 2018). Lastly, focused groups encompassing managers from health insurance, EDI providers, and Private healthcare providers (hospitals) will be used to ensure the data is consistent with questionnaires and interviews to help synchronize data collected and ensure that the study information given is unbiased. This will be done by the researcher by checking the number of claims that used to clear when it was manual and doing a comparison with e-claim processing as well as checking the reduction in fraudulent claims being lodged have reduced.

3.5 Data analysis

The data received from the respondents will inform the recommendations and solutions to the study. To test the solutions, the researcher will use the data from interviews, questionnaires, and focused groups to compare EDI reports as well as service providers of when the claims were lodged and when insurance settled the debt claims. This will determine the payout ratio. Through the approaches used by the researcher, he will determine the length of time e-claims will stay at the health insurance before it is disbursed for payment. This will be the aging report of receivables from the hospital providers. The researcher will assess the number of rejected claims from payment reports to determine the rejection rate. This, in the long run, if not confirmed, leads to reduced cash flow that has been projected to be received.

3.5.1 Descriptive analysis

Interview responses will be analyzed using thematic analysis. The views of the respondent will be recorded and later the data will be coded to identify key themes from the data. The emerging themes will then be interpreted in relation to the research objectives. In addition, data from questionnaires will be analyzed using descriptive analysis. The filled questionnaires will first be checked for completeness. Descriptive analysis is the type of analysis of data that helps describe, show or summarize data points in a constructive way such that patterns might emerge that fulfill every condition of the data (Zikmund, 2010). To carry out descriptive analysis, the researcher will use Microsoft excel tools to calculate the mean and frequency that will help in identifying trends and relationships between dependent and independent variables. To visually display the information, the data will be presented using tables and pie charts from the questionnaire.

3.5.2 Regression analysis

To analyze the effect of EDI and cash flow relation and how it affects management regression analysis will be used. Gallo (2015) defines regression analysis as a set of statistical methods used to estimate relationships between a dependent variable and one or more independent variables. So, the analysis will determine the relationship between the efficiency of e-claims in cash flow management (dependent variable) and independent variables faster claim payment, reduced

fraudulent, repeated, or rejected claims, reduced operational costs, and slow adoption. using the formula given below:

$$Y=a+b1X1+b2X2+b3X3+b4X4+E$$

Since it is a multivariate case with four independent variables, the following represents the formula above:

Y = dependent variable (Efficiency of e-claims in cash flow management)
a = the constant (the point at which the line crosses Y axis)
b1 = slope/regression coefficient for variable X1(faster claim payment)
b2 = slope/regression coefficient for variable X2 (reduced claim rejection due to errors and fraud).
b3 = slope/regression coefficient for variable X3 (reduced operational costs)
b4 = slope/regression coefficient for variable X4 (slow adoption)
E= error/residual value

3.6 Research Quality

Good quality research provides evidence that is robust, ethical, stands up to scrutiny, and can be used to inform policymaking. The quality of this research will be determined by its reliability, validity, and objectivity.

3.6.1 Validity of the research

The validity of research refers to how well the results among the study participants represent true findings among similar individuals outside the study (Heale & Twycross, 2015). It shows how accurately a method measures what it is intended to measure. In other words, validity is about the accuracy of a measure. To ensure the validity of this study, the researcher will only design survey questionnaires and interview questions that investigate the impact of e-claims on private healthcare providers' cash flow management in Kericho County.

3.6.2 Reliability of the research

Reliability in research tells the extent to which the results can be reproduced when the research is repeated under the same conditions (Heale & Twycross, 2015). Reliability is about the consistency of a measure. To assess reliability, this researcher will check the consistency of results across different observers and across parts of the test itself. The researcher will check the number of claims that used to clear when it was manual and do a comparison with e-claim processing as well as check the reduction in fraudulent claims being lodged has reduced. The focused group sessions involving managers from health insurance, EDI providers, and Private healthcare providers will be used to ensure the data is consistent with questionnaires and interviews to help synchronize data collected and ensure that the study information given is unbiased.

3.6.3 Objectivity of the research

In its purest sense, the idea of objectivity assumes that truth or independent reality exists outside of any investigation. The researcher's task in this model is to uncover this reality without contaminating it in any way (Letherby, Scott & Williams, 2012). To ensure objectivity in this study, this researcher will report the data as it will be returned without altering any information. Any positive or negative information will be reported as it will be given by the respondents because the idea of this research is to get close to the truth as possible, not to prove my opinion.

3.7 Ethical Considerations

This researcher will familiarize himself and adhere to relevant University research policies and regulations, and legal issues, including but not limited to plagiarism, copyright, data protection, health and safety, and ethical considerations which might arise in the course of research. For instance, during data collection, the chosen participants will be informed about the purpose of the study and how the results will be used. The researcher will seek the participants' consent to collect information from them.

3.8 Risk-Benefit Analysis

A risk-benefit analysis is a comparison between the risks of a situation and its benefits in order to figure out whether a course of action is worth taking or if the risks are too high. The benefits of the proposed study will be the new knowledge gained to help healthcare stakeholders improve their cash flow management alongside offering more efficient services to their clients. The proposed study will also inform the direction of further studies in this field. The only potential risk that may arise involves loss of confidentiality. However, this risk will be mitigated by ensuring all responses including participant's identifiable information will be kept in a safe and private place. In addition, the data will be deleted when it is no longer needed. Therefore, the proposed study is feasible as the potential benefits outweigh the risks.

3.9 Dissemination and Utilization of the Research Findings

Dissemination and utilization of research findings involve the effective communication of research results to research users. Dissemination refers to the process of sharing research findings with stakeholders and wider audiences. According to Wilson et al. (2010), dissemination is essential for uptake, and uptake and use of research findings are crucial for the success and sustainability of practice-based research in the long term. The results of this proposed study will be shared with private healthcare managers, health insurance providers, and EDI providers in Kericho County.

The utilization of research findings involves taking the results of a research study and applying them to improve practice, develop new products or services, or inform policy decisions. Utilization of research findings can involve translating results into actionable steps that can be taken by stakeholders to improve outcomes (Wilson et al., 2010). This study is proposed to be conducted with the aim of improving the knowledge of healthcare providers on the importance of embracing and adopting electronic claims because there is a need to consolidate resources regionally especially when it comes to cash flow management technology. The results of the study, which are expected to generate new knowledge, will be utilized to educate healthcare providers and other stakeholders on how technology will influence the turnaround time of payment, help in reducing rejection of claims as well as debt period by insurance and reduce the number of fraudulent claims

that the providers may experience. The findings will be used to ensure private healthcare providers in Kericho County manage their cash flow more efficiently.

CHAPTER 4:

RESEARCH FINDINGS

This chapter presents data obtained in interviews and surveys and the various analysis performed. The main objective of this research was to assess the effect of the slow adoption of e-claims on private healthcare providers' cash flow management in Kericho County. The findings mainly show the relationship between the efficiency of e-claims in cash flow management (dependent variable) and independent variables faster claim payment, reduced fraudulent, repeated, or rejected claims, reduced operational costs, and slow adoption. Using data collected through interviews and survey questionnaires, the findings are presented as follows:

4.1 Category of service providers

In this study, it is important to identify the information of the participants in terms of how long they have been operational in Kericho County and the healthcare service provider industry they represent. This data was captured both in the interviews and the survey. The survey sought to understand how many participants were representing healthcare insurance firms, private healthcare providers, and EDI providers. The survey had a total of 88 responses as opposed to the targeted population of 102. The chart below shows the summary of the survey respondents who included health insurance, private hospitals, and EDI providers.

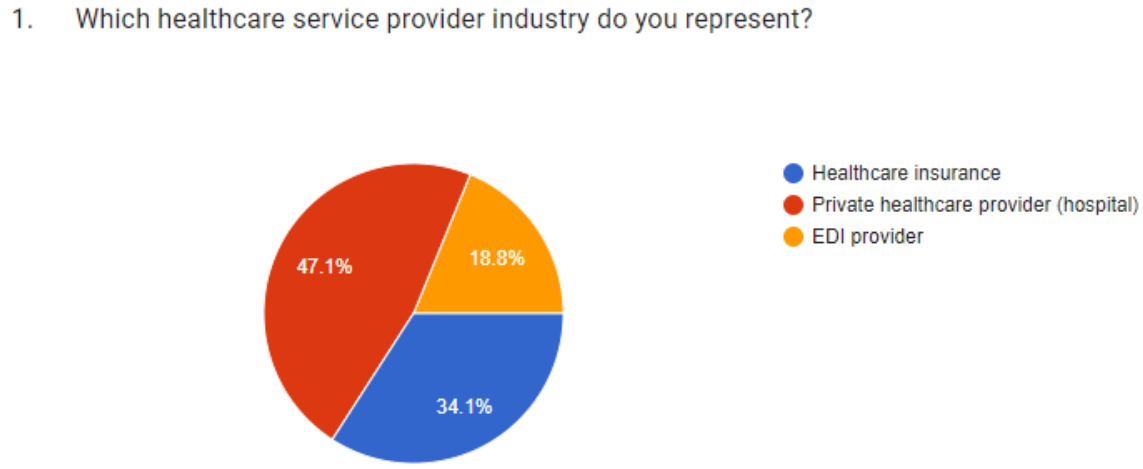

Figure 4.1: summary of service providers

For the interviews, the participants to represent healthcare insurance providers included Waumini Insurance Brokers Limited, Claimsdot Insurance Solutions, Mutual Trust Insurance Brokers Limited, Eagle Africa Insurance Brokers Kenya Limited, and UAP Insurance. In pursuance of Section 184 of the Insurance Act of Kenya, these insurers are authorized to transact business as Insurance Brokers, Claims Settling Agents, and Medical Insurance Providers. Participants representing EDI providers included Smart Applications International (UAP partner), AfyaServe, and Savannah Informatics. Table 4.1 shows the summary of the participating hospitals and how long they have been providing healthcare in Kericho County. The interviewees were also senior managers for each healthcare service provider.

Table 4.1: Participants' information

	Hospital Name	**The period in operation in Kericho County (years)**
1.	Siloam Hospital.	23
2.	AIC Litein Hospital.	98
3.	St Leonards Hospital.	18
4.	Greenview Nursing Home.	27
5.	Bliss Kericho Medical Centre.	11
6.	Kericho Women's Clinic.	7
7.	Unilever Tea Central Hospital.	18
8.	Fig Tree Health options.	10
9.	Roret Medical Clinic	26
10.	Elephant Dental Clinic	15

4.2 Process of medical claims

This study found that before an insurance company reimburses hospitals, the claims undergo rigorous and complicated phases. EDI providers' main goal of partnering with healthcare providers is to ensure hospitals have organized billing processes. Similarly, both healthcare providers and health insurers partner with EDI providers to help in establishing a clear and streamlined collections process that minimizes staff burden and efficiently captures revenue. The interview with the participating healthcare center managers targeted an understanding of the role these managers perform in the process of making medical claims. Overall, the managers provided a

glimpse of how the entire claim process goes to the last phase of reimbursement. To be eligible for payment, a claim goes through a number of processes, which according to the respondents, are designed to weed out ineligible claims.

AfyaServe respondent expressed their company efforts to allow hospitals and insurance firms to expedite claims by maximizing their "*client's revenue with tools to track and follow-up on appeals and resubmissions*." It was noted that most claims start with the patient filling out a medical claim form, which is used to transfer that data into a computer. The result shows that during the data entry phase, hospitals rely on data interchange to submit the claims where through the help of the EDI provider's technology, the claim is validated and verified based on the patient's benefit plan as well as the insurance provider contract. As the Unilever Tea Central Hospital manager said:

> *"When patient data is entered into our system, the first thing is to check for accuracy in terms of insurance information. And this is where we determine the patient's eligibility and how much the insurance provider will cover and communicate the same to the patient in case of a required top-up."*

The terms of the insurance provider as well as the eligibility of the patient determine whether a claim is accepted or denied. Some of the reasons given by the participants for possible claim denial include duplicated services, limitations on services, or service conflicts such as having a third-party responsibility. A claim that reaches the final phase of reimbursement, achieves a 'paid status after which the payment is released to the healthcare provider. For instance, the respondent representing Bliss Kericho Medical Centre claimed that their patients who are covered by any of the insurance companies they have partnered with should have a claim completely signed by the doctor alongside other identifiers such as ID, medical insurance card, and duly signed prescription from the doctor.

As the survey results in Figure 4.1 shows, 31 survey participants indicated that it takes approximately 1 to 2 months for an e-claim to be approved, while 22 participants said it takes less than a month. There were those who said it takes 2 to 3 months and others said more than 3 months. This data may explain the process that claims usually undergo before they are reimbursed as they are those that get returned along the process and therefore take longer to be paid.

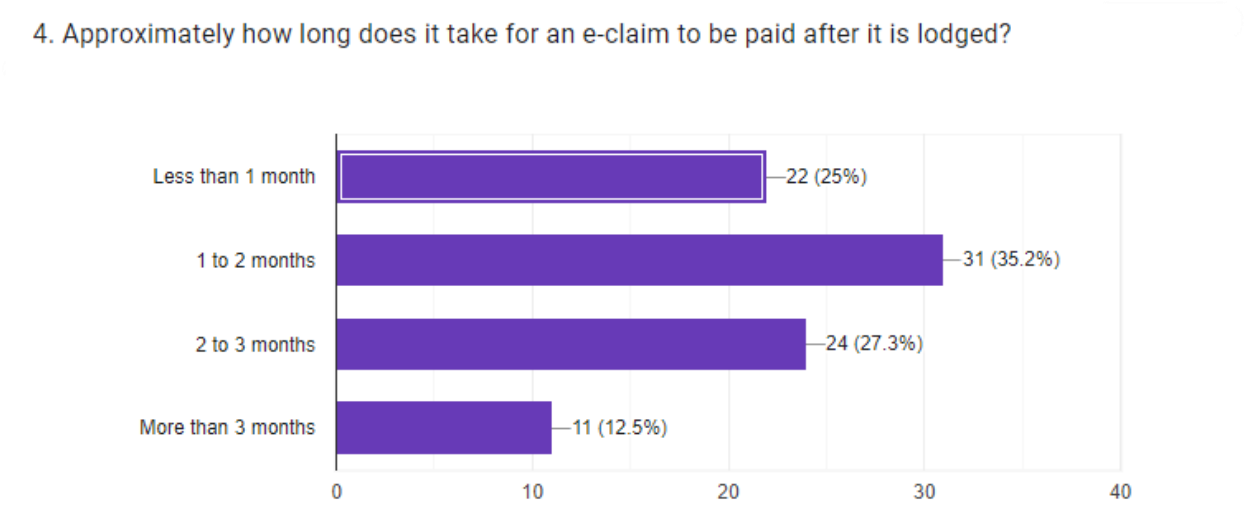

Figure 4.2: Claim approval period

Based on the interview responses, it emerged that most private hospitals in Kericho County work in partnership with various insurance providers. The most commonly identified insurance providers included National Hospital Insurance Fund (NHIF), Sanlam, Britam, Madison, Jubilee, AON, Trident, Heritage, CIC, Sedgwick, ARR, Equity, Afya Poa, Pioneer, and UAP. Another significant observation from the interview data concerning insurance providers or Private hospitals in Kericho County was the fact that NHIF almost all the participating hospitals are NHIF accredited. The interview revealed that almost all these insurance companies require the same claim procedure from the launching phase to the payment phase.

4.3 Fraud

Participants representing healthcare providers were asked to give their views on the role played by EDIs in reducing fraudulent claims. The researcher also enquired whether the participants have ever assisted a patient in making fraudulent claims and if so, how many times and what were the consequences. The study found that the technology used in EDI makes it easy to identify any false or mismatched information in claims. To ensure the validity of this claim, the respondents were asked whether their organization has adopted the use of EDI-powered e-claims or not. The findings show that most private healthcare facilities in Kericho County have adopted the use of EDI, although for most the process starts with manual capturing of patient data before a claim is launched electronically. In addition, all insurance provider interviewees confirmed that their

organizations have already adopted EDI technology in claim processing, something which they agree to some extent has reduced fraudulent claims and improved efficiency in claim processing.

Although the insurance provider interviewee mentioned fraud as the biggest challenge that healthcare insurer faces in the provision of medical insurance in Kenya, there was no identification of any healthcare provider who has ever assisted a patient in making fraudulent claims. However, some participants highlighted some of the possible consequences when a fraudulent claim is launched and detected. Some of the consequences included termination of policy on the insured or denial of service privileges on the side of the healthcare provider. The participants representing health insurers were asked how they determine when to allow or deny patients access to healthcare. The results show that in an attempt to control costs or block fraudulent claims, insurers have a maximum limit cover that a policyholder can reach. AfyaServe respondent said: "*One of the most effective means of combating fraud for an insurance company today is adopting data technologies that cut the time needed to recognize fraud*." Based on the RBV theory, it is evident that the adoption of EDI technology, no matter how slow the adoption is, reduces the number of fraudulent claims.

The insurers also ensure rigorous claim processing and where there are doubts about a claim, it is returned for review before further processing. In this regard, the insurance provider representatives were asked to clarify how they know when a claim is legitimate and when it is a fraud. It emerged that most insurers are using technological aids to detect fraud. Some insurance companies have a fraud investigation unit to take a keen look at each launched e-claim. The respondents also noted that sometimes it is easy to lose a significant amount of money to fraudulent claims even when technology and special investigation units detect fraud. Similarly, the insurers agreed that it is hard to notice when hospitals collude to falsify claims since both parties will have provided their signature to show the authenticity of the claim.

4.4 Effect of e-claim on cash flow management

The money a firm has come in from revenue and going out for expenses can cause a business to fail if not managed properly. Through the lens of the Cash Conversion Cycle theory, cash management is like a see-saw that companies need to balance between keeping cash on hand and

investing in assets. Firms need enough cash to be liquid enough to pay suppliers and cater to other daily operational costs. Asked to comment on how e-claims impact cash flow management in healthcare, all hospital interview participants were of the view that it is important to collect accurate patient data and carefully track it to achieve efficient revenue cycle management.

Cash flow management may also be affected by how much time it takes for an insurance firm to approve and pay the launched claim. On the question of the approximate time it takes for insurance companies to approve and pay medical claims, the interviewees gave approximately 30 to 60 days. The reason for giving this range was that "*some claims may have no issues so they pass all the phases of medical billing while others may be denied and sent back for review, an exercise that consumes more time*" (Respondent, Roret Medical Clinic). When claim processing works smoothly without back and forth, it affects how quickly healthcare providers get paid and how much doctors are owed. This in turn affects the overall cash flow management in the hospital.

It was discovered that e-claims can affect cash flow management in a negative manner especially when the insurance provider pays the hospitals less than the quoted money. For instance, the interview representative for Siloam mentioned how sometimes they receive a "*fixed amount for every patient treated even if the insured have had complex or simple treatmen*t." As such, a hospital that undergoes the same as Siloam, which is usually the case since these hospitals partner with almost the same insurance firms, will often not be paid enough to cover their expenses, and their finances will never balance.

In terms of debt period, the results reveal that EDI reduces the debt period by insurance, but this depends on whether a claim has issues that need further validation or not. The debt period, in this case, implies the average time taken to collect trade debts. Using the Cash Conversion Theory, the insurer does not typically pay a claim immediately after it is launched. This means the cash is not tied up for the entire operating cycle, but just the time from when the claim processing begins to the reimbursement phase. This length of time or payables conversion affects cash flow in varied ways. A short debt period indicates increased efficiency and vice versa. For most insurance firms, it was found that the debt period has reduced to the utmost 45 days due to the adoption of EDI technologies. In terms of cash flow management, a long debt period can have a huge negative impact because that reduces the healthcare provider's ability to pay suppliers or even employees.

Using the RBV theory, EDI in medical billing improves the turnaround time of payment, rejected claims, and debt period by insurance among private healthcare service providers.

4.5 Importance of EDI in medical billing

Medical billing is a complex process due to the complexity of billing and coding and the many different parties that need to be involved. The interview with EDI providers sought to identify some of the advantages of EDI on medical billing as well as on general healthcare provision. The data shows that using EDI for healthcare transactions improves productivity in that it enables a high level of accuracy, efficiency, and speed. Because there is limited human intervention, errors are reduced and consequently reduced claim processing delays. EDI minimizes the instances of manual data errors, shipping errors, billing address errors, and the like. In healthcare generally, EDI technology not only saves money and streamlines transactions, but it also ensures the security and safety of sensitive data. Healthcare facility respondents argued how the introduction of EDI in healthcare has helped in providing a quicker turnaround of information as opposed to when they were dealing with an enormous number of documents, tons of paper, and hundreds of returned claims.

To ensure healthcare organizations and insurance firms using EDI are compliant, the providers ensure that hospitals have a proper healthcare claim transaction set that will allow the submission of healthcare claim information and encounter information. Similarly, they ensure insurers have a healthcare claim payment/advice transaction set that they will use to make payments and send Explanation of Benefits (EOB) remittance advice to healthcare providers. In addition, Savannah informatics respondent highlighted the importance of paying attention to various things that comply with EDI requirements such as “having proper system architecture that will allow processes to run smoothly and efficiently and others.” Other respondents mentioned the importance of using encrypted systems to secure the exchange of protected health information and privacy and using role-based access.

4.6 Descriptive analysis

After data collection through surveys, a descriptive analysis was performed using Excel to determine the various indicators such as mean and frequency in order to identify trends and

relationships between the dependent and independent variables. The results are summarized below in the form of tables, graphs, and charts. Based on the survey results, it was found that 86% of the organizations working with healthcare providers have adopted EDI technology. The results are summarized in the graph below (Fig. 4.2):

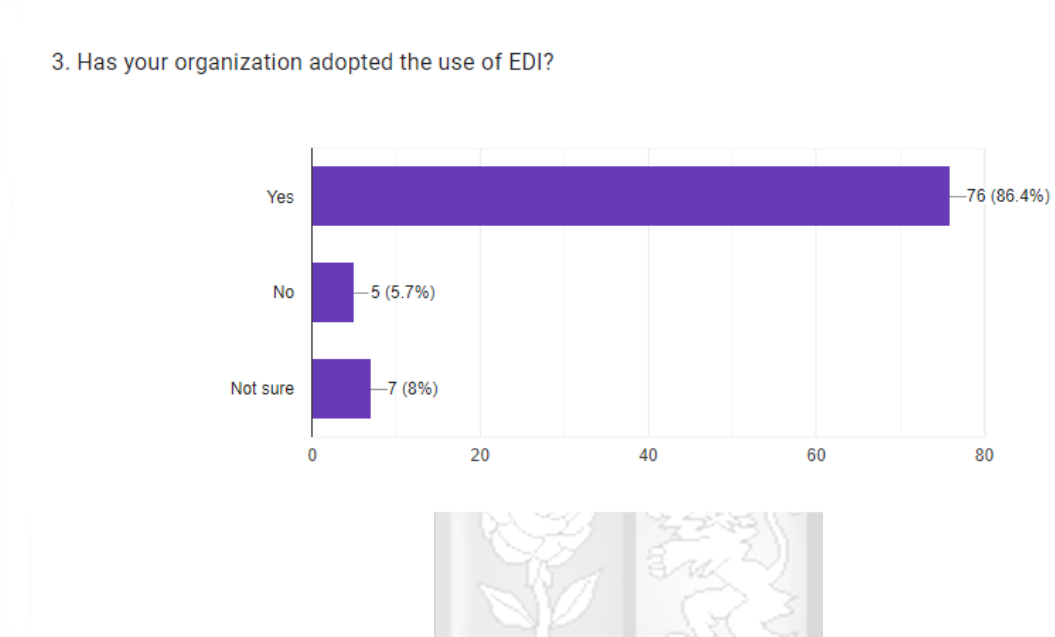

Figure 4.3: Rate of EDI technology adoption

One of the key objectives of the study was to assess the real cause of the slow adoption of electronic claims by private healthcare providers in Kericho County and what are the effects. This was based on literature that claimed most hospitals in Kenya are slow to adapt to technology. Based on the above data in Fig 4.3, it is clear that most of the selected or participating organizations have already adopted the use of EDI technology in their operations.

Table 4.2 presents the various measurements performed through descriptive statistics to measure the dependent and independent variables. The respondents were asked to what extent they agree or disagree with various statements concerning the efficiency of e-claims on private healthcare providers' cash flow management in Kericho County. The responses ranged from strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The tables show the calculated mean, median, and mode using the values representing each choice.

Table 4. 2: Central Tendency

Variable	*Rejection*	*Cost*	*Timely*	*Fraud*	*Slow adoption*	*CFM-efficiency*
Mean	3.84	2.02	3.72	3.95	3.82	3.61
standard error	0.11	0.12	0.11	0.11	0.11	0.12
Median	4.00	2.00	4.00	4.00	4.00	4.00
Mode	4.00	2.00	4.00	4.00	4.00	4.00
Standard Deviation	1.00	1.11	1.06	1.00	1.07	1.11
Sample Variance	1.01	1.24	1.13	1.01	1.14	1.23
Count	88	88	88	88	88	88

The mean on most independent variables is more than 3.5 except for the cost variable which received a mean of 2.02 representing a neutral position. This means that most participants agreed that the efficiency of EDI in cash flow management is influenced by the time taken to pay claims, the number of rejection claims, fraud, and slow adoption. The mode and median were 4.00 (agree) on most variables except cost as well with a median and mode of 2.00 (neutral).

4.7 Regression Analysis

Multiple regression analysis was run in Excel using the cleaned survey data they have a significant correlation with the independent variables as the predictor (X variables) and the dependent variable as the outcome (Y variable). Regression statistics from 88 observations show that R^2 which happens to be the coefficient of multiple determination or dependent variables is 0.7469. This value is closer to 1, so it shows a smaller difference between the observed data and the fitted values.

As shown in Table 4.3, the P-value is used in this research to determine which predictor is significant in the regression analysis. P- value (significance value) means the probability that there is not a true relationship between those variables in a population. A P value has to be less than 0.05, meaning that there is a 95% chance that there is a true relationship in the population.

Table 4. 3: Coefficients and p-value

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*

Intercept	-0.42	0.29	-1.45	0.15	-1.01	0.16	-1.01	0.16
Rejection	0.35	0.10	3.46	0.00	0.15	0.55	0.15	0.55
Cost	0.12	0.06	2.21	0.03	0.01	0.23	0.01	0.23
Timely	0.41	0.10	4.14	0.00	0.21	0.60	0.21	0.60
Fraud	0.38	0.09	4.14	0.00	0.20	0.57	0.20	0.57
Slow-adoption	-0.15	0.08	-1.86	0.07	-0.32	0.01	-0.32	0.01

Based on the results shown in Table 4.3, rejection, cost, timely payment, and fraud are the strongest predictors of the efficiency of e-claims in cash flow management as the P value is less than 0.05. However, there is no strong relationship between the slow adoption of EDI and e-claims in cash flow management because the P value is 0.07, which is slightly greater than 0.05. Below is the equation for the significant predictors:

$$Y=a+b1X1+b2X2+b3X3+b4X4+E$$

E-claim efficiency in CFM = $-0.42 + 0.35X_1 + 0.12X_2 + 0.41X_3 + 0.38X4 + 0.5743$.

4.8 Benefits of EDI Application in private healthcare services

Survey participants were asked about their level of agreement with statements concerning the benefits of EDI application in private healthcare services. Table 4.4 shows the summary of the results.

Table 4.4: Benefits of EDI application in private healthcare services

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	Total responses
EDI enhances the efficiency of healthcare	**15**	**3**	**5**	**58**	**7**	88
Increases productivity (more accurate with fewer errors)	**7**	**11**	**5**	**8**	**57**	88

EDI ensures the quality of care	**3**	**7**	**11**	**58**	**9**	88
EDI addresses the problem of rising healthcare costs related to manual billing	**9**	**6**	**7**	**14**	**52**	88
EDI ensures that customer needs are met for higher customer satisfaction	**6**	**7**	**10**	**52**	**13**	88
EDI helps in meeting regulatory or trading partner requirements	**9**	**9**	**4**	**28**	**38**	88
Reduces the risk of denied claims	**2**	**9**	**13**	**41**	**23**	88
Reduced paperwork	**7**	**9**	**8**	**32**	**32**	88
Improved data security	**3**	**9**	**11**	**36**	**29**	88
Reduces medical billing mistakes	**5**	**6**	**12**	**36**	**27**	86

Based on the results in Table 4.4, it is evident that EDI application in healthcare is believed to be highly advantageous. The highest number chose “Agree and “Strongly Agree” as their preferred choice in each statement. A significant number was also “Neutral on most statements, indicating their neither agree nor disagree. Nevertheless, efficiency, increased productivity, reduced healthcare cost, improved quality of care and customer satisfaction received the highest number of respondents who Agreed and strongly agreed.

CHAPTER 5:

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion

5.1.1 Summary of Research

This chapter presents a detailed discussion of the study findings. As the study sought to assess the effect of the slow adoption of e-claims on private healthcare providers' cash flow management in Kericho County, the collected data was analyzed to understand if there exists a relationship between faster claim payment, reduced fraudulent, repeated or rejected claim, reduced operational costs, slow adoption and the efficiency of e-claims in cash flow management. The study applied both qualitative and quantitative approaches (mixed method), combining data obtained from interviews and survey questionnaires. The key finding of the study based on regression analysis was that rejection, cost, timely payment, and fraud are the strongest predictors of the efficiency of e-claims in cash flow management. However, there is no strong relationship between the slow adoption of EDI and e-claims in cash flow management. Where applicable, the discussion links the research findings to the empirical literature as well as the RBV theory, cash conversion theory and TAM.

5.1.2 Effect of e-claims on the claim payment period

The first objective of the study was to examine if the adoption of e-claims can make claim payments faster. First of all, electronic claims processing reduces all the paperwork involved. There are even cases in which paper claims are no longer accepted. This leads to the fastening of the payments and also to reducing the costs. By enrolling in an EDI system, these healthcare facilities can process these transactions in a secure, fast, and cost-effective manner. The systematic collection and handling of patients' health information using EDI frameworks benefit all stakeholders, including healthcare institutions, healthcare providers, patients, and insurers. This also ensures uniformity in data processing and storage, and that no data is lost or misinterpreted.

Secondly and probably more importantly, by using electronic claims processing methods, the errors are much easier identified and therefore corrected. If, for instance, a claim is submitted on

paper, although it might be received and processed, the sender may never receive an answer from the insurance company. After some time like 30 days, the claim sender might want to check the status of the claim and only then be informed of the issues that might have arisen, such as spelling errors or incorrect data. Obviously, the claim has to be resent and wait for the whole process to start over. With electronic claims processing, on the other hand, one can be sure a claim is received in a proper state. Mostly, the system sends a report within the first 24 or 48 hours upon e-claim submission, letting the sender know whether the claim was properly received or not, or whether it had errors or not. With the adoption of EDI technology in most private healthcare centers as well as insurer, the e-claim processing period has significantly reduced. However, the data saved in a hospital's electronic health records vary considerably from the data found in an insurance company's records. All healthcare organizations are required to follow a standardized mechanism to process patient billing, insurance claims, and other important documentation. The study found that insurance providers take the utmost 45 days to pay a claim. Some respondents indicated that their claims had been reimbursed within a month.

Any challenge that is experienced in the processing of e-claims can affect cash flow in various dimensions. Claim management is an important part of a medical provider's routine, as it's not only the most vital component of their income planning but also a factor that defines the quality of services they deliver to their patients. This process involves five major steps (appointment scheduling, visit, claim submission, claim adjudication, and payment approval/disapproval), and the claims processing problems that may occur at each, can affect the end result. Based on the study findings, the possibility of having fraudulent claims is one of the challenges that affect cash flow management. The results show that although insurance providers may not easily identify fraud, using EDI to detect such occurrences is helpful.

A delayed payment period when there are issues with a claim is a challenge that was identified in the study. The cash conversion theory supports the finding on the reduced debt period. Claiming process involves a lot of parties and requires plenty of correct information to be processed accordingly. The problem is, the more touchpoint it requires, the more errors may occur, especially if done manually. Long processing time may cause delays in payment receiving, while processing large amounts of sensitive data via non-compliant technologies may lead to data leaks. If not

addressed in a timely manner, these claim processing challenges may be the reason for having bad cash flow.

5.1.3 Effect of e-claims on the claim rejection rate

The second objective of the study was to determine if the adoption of EDI solutions can reduce the claim rejection rate (fraudulent, repeated, or rejected/denied claims). From a theoretical perspective, the RBV theory supported the finding about fraud reduction when using EDI technology. The empirical review showed that in medical billing, EDI technology helps in swift claims submission, cost-saving, and timely insurance reimbursement, all of which impact cash flow management. The arduous process of filing paperwork riddled with human errors made denials in claims quite common. With EDI, claims can be submitted rapidly through digital communication channels. Additionally, this data can be proofread and analyzed with the help of digital tools to remove inaccuracies. Similarly, once claims have been submitted, the electronic platform allows easy processing and auditing, since all data has been formatted as per the EDI guidelines. This streamlines the billing process and leads to quicker reimbursements, minimizing the possibility of claim denials. RBV theory supports the finding on improvement in medical billing turnaround time of payment, rejected claims, and debt period by insurance among private healthcare service providers.

5.1.4 Effect of e-claims on operational costs

The third objective was to analyze how EDI solutions like e-claims reduce operational costs for both the insurer and the healthcare providers. The research showed that EDI in medical billing has saved healthcare institutions billions of dollars due to the limitation and elimination of data inaccuracies. The time spent in identifying errors, rectifying the mistakes, and rebilling the payer can cause significant delays and slow down the revenue cycle, which can lead to a significant surge in business operating costs. Digitization of data helps cut down the cost of buying paper and other relevant materials in addition to improving transparency in financial reporting. With EDI and healthcare data management, all claims and reimbursements are electronically tracked and summarized through automated digital tools. With reduced costs, rare inconsistencies, swiftly submitted claims, and timely reimbursements, financial reporting is now easier to process with

each billable procedure accounted for. Consequently, EDI in medical billing streamlines the revenue cycle by helping submit cleaner claims.

5.1.5 Rate of adoption of e-claims in private hospitals

The final objective of the study was to assess the effect of slow adoption of e-claims in private hospitals in Kericho County. Getting paid promptly and accurately is a chief concern for many practitioners. Electronic claim submission is one tool practitioners are increasingly using to facilitate the claim reimbursement process. Practitioners are finding that transmitting insurance claims electronically to carriers managed care companies, and other healthcare payers can increase their practice's cash flow and help to streamline their billing operations. Under the Technology Adoption Model (TAM), it can be argued that the technology adoption process in private hospitals is affected by various factors including the perceived usefulness, perceived ease of use or the availability of resources (also under RBV theory). Not all private hospitals have the same perception when it comes to adopting e-claims. The perceived usefulness of e-claims is arguably the greatest factor influencing the adoption rate. Hospitals need to see how efficiency and accuracy of claims can be improved through e-claims before adopting the technology. The ease of use is also an important factor, as hospitals need to see how easy it would be to learn the new system and adopt it. The study found that most private hospitals have adopted the use of EDI technology to process e-claims. There is a lot of argument about electronic claims processing when it comes to medical issues. More and more insurance companies, if not all of them already, require their clients to adopt these electronic claims processing methods to ease the work. The challenge maybe the availability of resources for private hospitals including financial, human resources as well as technical resources.

5.2 Conclusion

Patients deserve their provider's undivided attention, and an integrated EDI solution can help them get it. Rather than wasting valuable provider time on manual claims management, EDI providers in healthcare can relieve the burden. Claims sent electronically reach the payer faster, are processed faster and are paid faster than claims submitted to the payer on paper. The primary purpose of this research was to assess the effect of the slow adoption of e-claims on private healthcare providers' cash flow management in Kericho County. The researcher is of the opinion that this objective was met. Combining a literature study with an empirical investigation allowed the researcher to reach the set objectives of the study.

The researcher applied both qualitative and quantitative research approaches. Qualitative data were obtained from interviews with managers from the chosen organizations. On the other hand, quantitative data was acquired from a survey questionnaire distributed to private healthcare providers in Kericho County, select insurance providers, and EDI providers. Qualitative data was analyzed through thematic analysis while quantitative data was analyzed using both regression analysis and descriptive statistics. The dependent variable for the study was the efficiency of e-claims in cash flow management while the independent variables included faster claim payment, reduced fraudulent, repeated, or rejected claims, operational costs, and slow adoption. Analysis was carried out to determine if there exists a relationship between these variables.

In conclusion, the researcher is of the opinion that claims submitted electronically are processed more quickly, resulting in faster payment and improved cash flow management for private healthcare providers. In addition, the study concludes that e-claim submission eliminates the need to fill out and store paper claims, helping to streamline hospital billing procedures and simplify record keeping. The overall conclusion of this study is that although variables such as rejection, cost, timely payment, and fraud are the strongest predictors of the efficiency of e-claims in cash flow management, there is no significant relationship between the slow adoption of EDI and e-claims in cash flow management.

5.3 Recommendations for Further Study

While the research focused on private healthcare providers in Kericho County, further research could be done to investigate the adoption of EDI technology and its effect on cash flow management in both private and public healthcare providers in the County. This research could also be repeated in other counties across Kenya. As such, further studies can seek to include either all private hospitals in Kenya or both private and public, and include more insurance provider participants as well as EDI providers in order to have comprehensive findings of the study area. This will also solve the limitation of having a small sample size which was the case in this study.

In addition, the research focused on understanding the effect of EDI technology on cash flow management. Further research needs to be conducted to review other critical areas of healthcare operation processes or healthcare ecosystems that are largely impacted by the adoption or lack thereof of EDI technology.

In relation to the lack of a strong relationship between the rate of adoption of EDI and e-claims in cash flow management, further studies can be conducted to prove or counter this newfound hypothesis.

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APPENDICES

A: INTRODUCTORY LETTER

Danny Mwendwa Matolo,
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24th June 2022.

Dear participant;

I am a Masters student from Strathmore University. I am conducting a study to explore the effect of the rate of adoption of e-claims on private healthcare providers' cash flow management in Kericho County.

You have been selected to participate in this research that is largely expected to improve the knowledge of healthcare providers on the importance of embracing and adopting e-claims because there is a need to consolidate resources regionally especially when it comes to cash flow management technology. Most importantly, the findings of this study will help private healthcare providers in Kericho County to manage their cash flow more efficiently.

With your consent, participation in this study will require that I ask some questions and your responses will be recorded for purposes of analysis. It is also voluntary to participate in this study. Therefore, you can leave the study whenever you are not comfortable or leave some questions unanswered at your will. There are no consequences when you leave the study. It is also my pleasure to inform you that the interviews/survey will be conducted at your convenient time. Additionally, no known benefit or reimbursement is expected from participation in this research. In this research, there are no expected or foreseeable risks of harm to participants except for an instance of loss of confidentiality. However, this risk will be mitigated and the researcher assures you that all your responses including your identifiable information will be kept in a safe and private place.

Thank you for your participation and cooperation.

Sincerely,

Danny Mwendwa Matolo

Date …….

B: Survey Questionnaire

The purpose of this research is to explore the effect of the rate of adoption of EDI in cash flow management on private healthcare providers in Kericho County. Your response will be used to improve the knowledge of healthcare providers on the importance of embracing and adopting e-claims because there is a need to consolidate resources regionally especially when it comes to cash flow management technology. Most importantly, the findings of this study will help private healthcare providers in Kericho County to manage their cash flow more efficiently. Please note that participation in this study is voluntary.

1. Which healthcare service provider industry do you represent?

- Healthcare insurance
- Private healthcare provider (hospital)
- EDI provider

2. Please indicate how long you have worked with your organization.
    - Less than 5 years
    - 5 to 10 years
    - 10 to 15 years
    - More than 15 years

3. Has your organization adopted the use of EDI?
    - Yes
    - No
    - Not sure

4. Approximately how long does it take for an e-claim to be paid after it is lodged?
    - Less than 1 month
    - 1 to 2 months
    - 2 to 3 months
    - More than 3 months

5. To what extent do you agree/disagree with the following statement concerning the key benefits of EDI application in private healthcare services?

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
EDI enhances the efficiency of healthcare					
Increases productivity (more accurate with fewer errors)					
EDI ensures the quality of care					

EDI addresses the problem of rising healthcare costs related to manual billing					
EDI ensures that customer needs are met for higher customer satisfaction					
EDI helps in meeting regulatory or trading partner requirements					
Reduces the risk of denied claims					
Reduced paperwork					
Improved data security					
Reduces medical billing mistakes					

6. To what extent do you agree/disagree with the following statement concerning the key challenge of EDI implementation/application in private healthcare services?

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Risk of system instability					
Inadequate staff training on use of technology in healthcare					
Difficulty in fully integrating existing computer systems with EDI					
High cost of changing to new technology (software, training, maintenance, etc.)					

Lack of technical support					
Lack of awareness of the use of EDI in healthcare					
The proliferation of standards for information exchange of protocols, procedures, and data forms.					
Incompatibilities between EDI software and in-house applications					

7. To what extent do you agree/disagree with the following statement concerning the efficiency of e-claims on private healthcare providers' cash flow management in Kericho County

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Improves cash flow management					
Low loss of revenue due to reduced medical billing mistakes					
Saves time and resources in medical claim processing (reduced operational cost)					
Helps in submitting accurate claims to boost cash flow (avoidance of fraudulent, rejected or rejected claims)					

slow adoption of EDI leads to inefficiencies in processing e-claims					

C: Key Informant Interviews

Private healthcare providers

1. For how long have you been in the healthcare industry?
2. What is your role in the process of making medical claims?
3. What is the approximate period of time that insurance companies take to honor medical claims?
4. Has your organization adopted the use of EDI-powered e-claims?
5. What is the impact of e-claims on your cash flow management?
6. Have you ever assisted a patient in making fraudulent claims? If so, how many times and what were the consequences?
7. What is your opinion on the role EDIs play in reducing fraudulent claims?
8. Do you have any other comments on how e-claims impact cash flow management in healthcare?

Health insurance providers

1. For how long have you been providing healthcare insurance services?
2. What is the ideal process to make a medical claim?
3. How long does it take for a claim to be honored?
4. How do you determine when to allow or deny patients access to healthcare?
5. How do you know when a claim is legitimate and when it is a fraud?
6. Have you ever lost money to a fraudulent claim in the medical segment? If so, how much?
7. To what extent do you think hospitals collude with clients to falsify claims?
8. Has your organization adopted the use of EDI-powered e-claims?
9. What is your take on whether EDIs help to reduce fraudulent claims or not?
10. Do you think EDI reduces the debt period by insurance? If so, how?
11. What are the other challenges in the provision of medical insurance in Kenya?

EDI service providers

1. For how long have you been providing your service to private healthcare in Kericho County?
2. What are some of the advantages of EDI on medical billing?
3. How does EDI impact healthcare provision in general?
4. How do you ensure the healthcare system is EDI compliant?

5. Does EDI reduce fraudulent claims and rejection of claims? If so, how and what is the impact?
6. Does the use of EDI reduce the debt period by insurance?
7. Any additional comment on how electronic claims impact cash flow management of private healthcare providers in Kericho County?

D: List of targeted healthcare providers

1.	Siloam Hospital.
2.	AIC Litein Hospital.
3.	St Leonards Hospital.
4.	Greenview Nursing Home.
5.	Bliss Kericho Medical Centre.
6.	Kericho Women's Clinic.
7.	Unilever Tea Central Hospital.
8.	Fig Tree Health options.
9.	Roret Medical Clinic
10.	Elephant Dental Clinic