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E-commerce Cloud for Mandatory Islamic Insurance in Sudan

التجارة الإلكترونية السحابية للتأمين الإجباري الإسلامي في السودان

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Declaration

I declare that I have worked on this research independently using only the sources listed in the bibliography. All resources, sources, and literature, which I used in preparing or I drew on them, I quote in the research properly with stating the full reference to the source.

Ehsan Alhadi Tag-Eldin Suliman

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Regards, Ehsan AlhadiTageldinSuliman

Abstract

The research aimed to develop integrate web-based system for Taawuniya Insurance Company enable clients of the company to complete insurance process and payment service electronically. Electronic website system helped clients to complete their procedure of insurance by themselves, pay their fee electorally in any time any where .

Cloud Computing has a service layer known as Software as a Service (SaaS). SaaS has several advantages and conveniences offered, including those related to resource efficiency and speed in developing an application. With SaaS, electronic commerce cloud can be used at the same time by many insurance company, with each company still being protected, so that application development costs can be further reduced.

This research uses, Hyper Text Markup Language (HTML), Hypertext Preprocessor (PHP) and UML tools. This research aims to help insurance companies in sudan foundation improve the quality of insurance by utilizing e-commerce without the need to think about the process of procurement, installation and configuration of hardware or software.

المستخلص

يهدف البحث إلى تطوير نظام متكامل قائم على الويب لشركة التعاونية للتأمين يمكن عملاء الشركة من استكمال عملية التأمين وخدمة الدفع إلكترونيًا. ساعد نظام المواقع الإلكترونية العملاء على إكمال إجراءات التأمين بأنفسهم ، ودفع رسومهم إلكترونيًا في أي وقت وفي أي مكان .تحتوي الحوسبة السحابية على طبقة خدمة تُعرف باسم البرامج كخدمة .(SaaS) تتمتع SaaSبالعديد من المزايا ووسائل الراحة المقدمة ، بما في ذلك تلك المتعلقة بكفاءة الموارد والسرعة في تطوير التطبيق. مع SaaS ، يمكن استخدام سحابة التجارة الإلكترونية في نفس الوقت من قبل العديد من شركات التأمين ، مع استمرار حماية كل شركة ، بحيث يمكن خفض تكاليف تطوير التطبيقات بشكل أكبر. يستخدم هذا البحث ، لغة ترميز النص التشعبي (HTML) ، والمعالج الأولي للنص التشعبي (PHP) وأدوات .UML يهدف هذا البحث إلى مساعدة شركات التأمين في مؤسسة السودان على تحسين جودة التأمين من خلال الاستفادة من التجارة الإلكترونية دون الحاجة إلى التفكير في عملية الشراء والتركيب وتكوين الأجهزة أو البرامج.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning	Page
ACH	AutomatedClearingHouse	3
ATM	Automatic Teller Machine	15
CSS	Cascading Style Sheet	49
EDI	Electronic Data Interchange	11
EPS	Electronic Payment System	14
IaaS	Infrastructure as a Service (IaaS)	11
PaaS	Platfrom as a Service (PaaS)	11
HTML	Hyper Text Markup Language	49
ICT	Information and Communication Technology	1
IT	Information Technology	1
PHP	Hypertext Processor	49
PHI	Private Health Insurance	26
SHI	Social Health Insurance	26
SPSS	Statistical Package for Social Sciences	31
SaaS	Software as a Service	4
UML	Unified Modeling Language	29

CHAPTER ONE
Introduction

CHAPTER ONE

Introduction

1.1 Introduction

Information and communication technology (ICT) it refers to technologies that provide access to information through telecommunication. It is similar to Information Technology (IT) but focuses primarily on communication technologies. This includes the internet, wireless networks, cell phones and other communication mediums. **(Ratheeswari, 2018)**

Electronic-commerce focuses on the use of Information and Communication Technologies (ICT) to enable the external activities and relationships of the business with individuals, groups and other businesses. Electronic-business is defined as the application of ICT in support of all the activities of business. Objectives of e-business are worldwide presence, cost effective marketing and promotions, developing a competitive strategy and better customer service.

Electronic-insurance is defined as services that provide online insurance sales, services, and information sites. E-insurance can be broadly defined as the application of internet and related Information Technologies (IT) to the production and distribution of insurance services. In a narrower sense, it can be defined as the provision of an insurance cover whereby an insurance policy is solicited, offered, negotiated and contracted online. Insurance is a means by which you secure protection for yourself and your family against unforeseen circumstances. An insurer is a company selling the insurance; an insured, or policyholder, is the person or entity buying the insurance policy. **(Sapa1, 2014)**

1.2 Background of the research

Insurance began in Sudan through the emergence of agencies and branches of British, Swiss, French, Italian and Egyptian companies, often run by local institutions working in foreign trade. At the beginning, their activity was limited primarily to foreign trade insurance (marine insurance) and later extended to other insurance such as fire, accidents and life insurance.

These companies or their affiliated agencies were not subject to any kind of control until the end of 1960, where their number became more than 70 agencies. However, it was reduced to 36 agencies in 1970 when the Sudanese government decided to sudanize this activity and stopped the work of agencies. Six national companies entered the Sudanese market. Currently, the Sudanese insurance market consists of (14) direct insurance companies and one reinsurance company. **(group, 2019)**

Sudan is a low risk zone, having a low crime rate, rare fires, and moderate accident rate, all facilitating relatively low premium rates compared to other major african insurance markets. However, third party automobile insurance is compulsory and must be acquired in tandem with a driver's license, even if one does not own a motor vehicle. **(GloMedia)**

Technology has started having its impact on every aspects of life. When we think of financial aspect it is even more obvious. With invent implementation and spread of new technology there have been noticeable changes in insurance sector like any other sector of finance. **(Ostagar, 2018)**

Advances in technology are bringing about change in the traditional value chain and reconfiguring the competitive landscape of insurance. After a slow start, insurers are responding to the implications of the digital transformation. successful insurers use technology to acquire new

customers and increase engagement, provide and monetise new services, improve underwriting (including of new risks), and reduce back-office costs. **(Technology and insurance themes and challenges, 2017)**

Facing increasing demands from customers, insurers are beginning to invest in digital payment capabilities to better collect premiums, disburse claims, and reconcile transactions. Premium payments are the most frequent interaction between customers and insurers. Being able to easily make payments is an increasingly important factor for insurance buyers. Responding to this demand, more insurers are beginning to offer options for Automated Clearing House (ACH) services, credit/debit cards, mobile wallet payments, and pay-by-text to better serve digitally savvy customers. Insurers can cut costs with digital payments. Paper checks can be expensive for insurers compared to digital payments.

In recent years insurance companies have started replacing these legacy systems with more flexible and open core systems, enabling new approaches to payments. Customers have become increasingly comfortable with digital payments, with many preferring this option. Enabling customers to pay with a card online, via mobile wallets, or through text can improve their overall satisfaction with insurers. **(cbinsights, 2020)**

Insurance management system used in the most insurance company in sudan called aman, is designed to meet the highest international insurance standards and requirements.

1.3 Problem statement

Technology and new data sources are re-shaping the insurance industry. Adopting new technologies is key for insurance to improve their operations, optimize processes, and reduce cost. Traditional insurance systems in sudan insurance company have difficulties in their procedures,

clients complete their procedures of insurance by going to the company building and request for insurance , then complete long and complicated procedures , clients can not doing those procedure by themselves .

Traditional system in company needs to automate to allow clients to do registration, requested the insurance policy and payment online by electronic website facilitate the insurance, to save time and to win the satisfaction of the clients.

1.4 Objectives

- To investigateislamic insurance services in sudan.
- To automate an electronic payment system based on Software as a Service (SaaS), to payislamic insurance services at any time.
- To evaluate an electronic payment method, to increase the number customers and increase company sales.

1.5 Motivation

Putting technology in customer service, provide solutions that respond to customer needs, to pay the insurance fees at any time via the internet, also to reducing traditional cash transactions,no enough office, reduce cost of physical progress, .

1.6 Proposed solutions

Software as a Service (SaaS) cloud computing technology will be implemented, managing and maintaining e-payment in website by cloud servers, every electronic payment software is used simultaneously by allinsurance companies

The research will flow the descriptive analytical methodology based on collecting as much data as possible by means of a questionnaire whose data were collected from customers within the company. To diagnose the problem of the research, and then to reach the most important means that lead to solve the problem.

1.7 Scope of Research

This research in mandatory islamic insurance in sudan,Study inTaawuniya Insurance Company during the year 2020.

1.8Theses layout

This thesis is organized into five chapters as follows: Chapter one gives the Introduction, the problem statement, the objectives, and proposed solutions. Chapter tow contains the literature review, type of insurance, electronic commerce, electronic payment and related work will be introduced. Chapter three describes the definition of system analysis, objectives of system analysis, description of the current system, description of the proposed system, unified modeling language diagrams, system security and research tools. Chapter four includes the design and implementation steps, also screens of system. Finally, Chapter five contains the recommendations and conclusion.

CHAPTER TWO
Literature Review

CHAPTER TWO

Literature Review

2.1 Introduction

Businesses today avail the usage of the internet to facilitate their transactions with their customers. E-business is seen as an important invention that can change positively the way enterprises interacted with their customers, suppliers, competitors, employees and different stakeholders within and outside the company. The financial sector is one the industries embracing the online business to obtain sustainable competitive advantage. However, the insurance industry- including Islamic Insurance- has been a bit behind to adopt e-commerce. **(Rashid, 2018)**

Takaful is an Arabic word stemming from the verb "kafal", which means to take care of one another's needs or "guaranteeing each ,uses of takaful are inuring property, vehicles, goods, valuables, health, accidents and life. The main difference between takaful and conventional insurance, the customers (policyholders) of the takaful business agree to pool their contributions and share the liability of each policyholder. So if one policyholder has to pay a claim, it is paid out of the combined pool of the policyholder's contributions. This eliminates the principle of gharar (uncertainty) which is not allowed within Islam. **(Coetzer2, 2020)**

The insurance business may be seen as a simple one a client pays a fee to an Insurance company in order to receive compensation when an undesirable event occurs. As an example when an incident occurs which produces a loss to a client business, he claims back from the company some support, usually money, to mitigate that loss. Although some of these contracts are mandatory by law, such as Auto insurance for every vehicle on the road, the majority of the products dealt by Insurance

companies are not. Those products exist because opportunities emerged from the market, in which clients needed to manage the risks related to their work and day-to-day life. **(Viegas, 2015)**

2.2 Introduction to could computing

Cloud computing is a technology of storing and accessing data and programs via the internet or other means instead of local hardware/computer. It is a service provided remotely by servers, data warehouse, networking, software, analytics, and even artificial intelligence. In general, the cloud is a modern metaphor of the internet that provides a service of storing data and information remotely, and there is no need to keep it in a local hard disk and local server. The data and computing service is available from anywhere and at any time so that the end-user can use the service more efficiently and effectively. With the same notion, the cloud is defined in different ways by different stakeholders. **(bahattari, Cloud Transition, 2020)**

2.2.1 Cloud Computing

Cloud Computing is a radically new approach to the delivery of ICT services which promises- “anywhere” access to shared computing resources; “freedom” from capital expenditure on back-end computing equipment and software; the ability to provision computing services very quickly and cheaper than traditional models; and the ability to pay for such services on some form of metered or per-use basis.

Cloud computing is evolving, there are still considerable challenges pertaining to, between, security, legalities, jurisdiction, availability and reliability, and pricing models that provide definitive and sustained value. Accordingly, the move to Cloud Computing will take time.

This Strategy is based on extensive engagement, research and trials with the ICT field. this Strategy – places cloud computing at the heart of our ICT

Strategy; sets a course for centralizing and implementing our common ICT needs as a set of shared services; commits to reducing the number of our computer and data centers from potentially hundreds to approximately a few primary facilities; establishes our aim to use external service providers as much as possible in the fulfillment of this approach and to maximize competition in this regard by establishing multi-vendor procurement frameworks.

Details and timelines lists of ICT activities that we will migrate to Cloud Computing and shared services over a number of phases; and highlights our need to consider a new ICT organizational structure and new ICT funding and governance arrangements over time. Finally, it makes it clear that the implementation of the measures set out in this Strategy must provide tangible cost savings before they will be advanced.**Invalid source specified.**

2.2.2 The Backdrop of Technology Disruption

As new technologies emerge, customer needs and expectations quickly expand outside the boundaries of traditional products and services. As a result, B2B and B2C industries alike are now engaging platforms and ecosystems to access new customer segments and ushering in a disruptive wave of industry convergence. By applying advanced technologies, such as AI and IOT, industries can maximize agility in their customer-facing, middle- and back-office functions, reduce costs and optimize operations. **(THE CLOUD IMPERATIVE FOR INSURANCE , 2020)**

2.2.3 Features of cloud computing

On-demand self-service the main feature of a successful cloud service is to ensure resources are instantly available when needed, the on-demand services allow cloud service users to use computing resources as needed without human interaction consumer can schedule the use of cloud services such as computation and storage as needed in addition to managing and deploying these service.

Broad (Ubiquitous) network access is the second feature of cloud service is its capability and operationally using different networks promoting various platforms, including laptops, tablets, cell phones, and personal computers. Broad network access is typically accomplished using the built-in web browser for the device, as it is one of the most ubiquitous clients available.

Resource pooling is the third feature of the cloud is associated with the concept of different organizations sharing the available physical cloud infrastructure. It allows organizations to access a larger resource-pool compared to the physical and virtual infrastructure. Some examples of resource pooling are physical server pools, virtual server pools, storage pools, or cloud storage device pools, network pools, CPU pools, and memory Pools.

Elasticity and Flexibility cloud offers elasticity and flexibility. A cloud is elastic when the resources it provides can be provisioned and de-provisioned animatedly and automatically. Measured services another feature of the cloud is the ability to measure resource usage and charge customers. Cloud system automatically controls and optimizes resources use by enhancing leveraging capability based on the need for different types of services (storage processing bandwidth, active users account, etc.) The usage information can be reported and provided transparently for both service providers and consumers. **(bahattari, 2020)**

2.2.4 Types of cloud computing

The first type is Cloud computing deployment models types are classified based on their features, for example, elasticity, pay per or for use, self-service, resource pooling, or universal network access. Individuals and organizations make their selection based on their needs, data sensitivity, and their customers. Private cloud this is also known as an internal cloud

infrastructure assigned to an organization solely (not shared with others) with the options of either owning/leasing, managing by the organization/by a third party, at the premises or off the premises. A private cloud is hosted inside the organization's firewall.

Public cloud service is provided externally to the clients through websites and external servers. The clients get mainly supported for their-CRM, messaging, and office productivity services, for example, google and amazon, this type of cloud is suitable for computing, storage, and networking services. A community cloud is a shared infrastructure by various organizations and supports specific missions, vision, security concerns, or compliance considerations. In general, an independent third-party organization manages the service for its community users. This type of cloud infrastructure represents the feature of a high level of privacy security and compliance; for example, Google's Hybrid Cloud when an organization needs mixed features of different clouds, they go for a hybrid cloud. It is a mixture of either private, public, or community clouds.

Again the need for the cloud is entirely dependent upon data security and service. Suppose the organization wants to maintain data security will tend to use a private cloud, whereas the transaction could be done through public clouds for less security concern types. For example, Amazon Web Services (AWS) and MS Azure provide this kind of cloud service with orchestration among the various platforms. The second type is Cloud Services types are Cloud Software as a Service (SaaS) offers application hosted by service providers for its customers through the internet.

The nature of the software is more business than that of a consumer. SaaS helps remove the need to install and run an application on the user's computer and get the same benefits as commercial software with a

smaller cost outlay .The cloud software can minimize the cost of maintenance and support for the users. Some examples are CRM, Emails, Virtual Desktop, Communications, games, and apps. Infrastructure as a Service (IaaS)-An IaaS cloud allows on-demand computational resources in the forms of virtual machines (VMs) arranged in cloud provider data centers. The cloud service provider generally provides customers' infrastructure, from the data center premises, through the proper server, storage, networking hardware, and virtualization. Some examples of IaaS are virtual machines, storage, server, and networks.

Platform-as-a-service (PaaS)-This type of cloud service offers the environment where a service provider delivers a platform to different clients, enabling them to develop, run, and manage business applications without their need to build and maintain the infrastructure, e.g., software development. PaaS and server less computing charge only for computing, storage, and network resources used .Some examples are runtime, databases, web servers, and development tools. **(bahattari, 2020)**

2.3 Electronic commerce

Is trading in products or services using computer networks, such as the internet. Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, Electronic Data Interchange(EDI), inventory management systems, and automated data collection systems. **(Margarita Išoraitė, Electronic Commerce: Theory and Practice, 2018)**

2.3.1 Types of electronic commerce

Business (B) with Business (B): (B2B), Business (B) with Government agencies (G): (B2G), Private and other Business enterprises (B) with the budget, state-owned capital companies (G): (B2G), Public Authorities

and Budget Firms (G) with Public Institutions and Budget Firms:(G2G), Business (B), public authorities and budget firms (G) with individual Consumers and households (C), as well as by identifying buyers and recipients of electronic models:(B2C and G2C), Individual Consumers and households with each other: (C2C). **(Margarita Išoraitė, Electronic Commerce: Theory and Practice, 2018)**

2.3.2 Electronic commerce advantages

The advantages of electronic commerce are first convenience you save time by physically shopping, you can shop anywhere you have an internet connection and at any time. The second is information details and recommendations, detailed information is provided for each item in the e-shop. Here you can find product reviews and recommendations.

The third is lower prices and better choices, online sellers do not have to pay rent or wages to employees. It is convenient for you to compare prices for the same product in different e-shops in a short period, the forth is starting an e-business requires less investment than traditional commerce. The fifth is a wider circle of consumers is attracted(disabled, foreign clients), more varied and more convenient supply of goods and services, also it comfortable billing (bank charges, bank link integration).

2.3.3 Electronic commerce disadvantages

Disadvantages are the first is the ability to be cheated your money security depends on your vigilance, So before submitting your personal information, check that the online store is trusted when you buy online, you risk not getting or getting the same as the one shown in the photo. The second is easy to make a mistake on the price Keep in mind that the product will have to pay more than specified. The third is it lack of privacy some online stores even unsolicited send you emails about

various stocks and new items. On the one hand, this may seem useful, but on the other hand, it is a way to get you more money.

The forth is when ordering a product online, it often takes a long time before it is delivered, and shipping charges sometimes exceed the price of the item, especially if the product is ordered from abroad. Repaying your online purchase may be more difficult than buying a traditional store.

The fifth is often money will not be refunded for shipping, and in some cases, it will even have to cover the cost of returning the product itself. Also, when shopping online, it is important to make sure the website is trusted, and your credit card or online banking data will be protected. Finally, shopping online will not be able to see the goods (like clothes). **(Margarita Išoraitė, Electronic Commerce: Theory and Practice, 2018)**

2.3.4 Electronic commerce in sudan

The adoption and implementation of the e-commerce in Sudan which will lead to promote and increase the economic growth requires concerted all efforts at both the public and private sectors. To develop e-commerce applications Sudan needs to find a well-developed infrastructure for communications and maintains a good systems to manage , therefore, establishing and enabling legal and legislative suitable for providing protection and confidentiality to all parties engaged in ecommerce project. The role of government is to provide surveillance after the economic environment and stable legal ground and supervisory required, but the biggest role is the responsibility of the private sector in a serious and rapid response to these tools, and the ability to deal with these global strong telecommunication network. Sudan is considered very advanced countries in telecommunications and telephone network with fiber-optic which is one of the advanced telephone networks in Africa and the Arab world. In spite of this, Sudan still suffers from many problems limit the

use of the Internet, and access to the world of e-commerce. **(Eslam-Hassan MOHAMED 1, 2014)**

2.4 Electronic payment

Is a way of making transactions or paying for goods and services through an electronic medium, without the use of checks or cash. It's also called an Electronic Payment System (EPS) or online payment system. **(Wróbel-Konior, 2016)**

2.4.1 Types of electronic payment systems based on electronic transaction

There are four modes of internet-based payment systems the first is the cyber cash this is an online service in which a client's credit card information is processed, charged, and deposited in the dealer's account via electronic means. In this form of cash transfer, the cyber cash serves act as the payment gateway through which the payment is made. The system depends on digital signatures to ensure the security of the payment process. The second is first virtual holdings this is one of the early Internet-based payment platforms that depend on external confirmation techniques to facilitate online payments. This payment system is of particular interest because it does not depend on any form of encryption. It is only used for the selling of data over the internet, as against the exchange of goods and services. This system uses an automated telephone system to gather the payment information of the participants. Being that it does not depend on cryptographic techniques and digital signatures, it mainly depends on a careful monitoring of sales and purchases to reduce fraud.

The third is the inet bill This is a payment system that depends on the Internet to facilitate online secure transactions. As a micro-payment system, its server maintains buyers and sellers accounts, enabling clients to make payments for products. Information exchange in this system

involves exchange of bits with the customers and could be performed in any internal structure such as the search results of a database inquiry, a page of text, or a software program. Customers are billed based on the number of items they use; unlimited access can also be provided to members. **(Mostafa A.ALI, Electronic Payment Systems: Architecture, Elements, Challenges and Security Concepts: An Overview, 2019)**

2.4.2 Types of electronic payment systems based on Internet-based payment system

There are four basic methods of Internet-based payment systems the first is debit card the most utilized e-payment platform; its technique combines the concept of Internet banking with Automatic Teller Machine (ATM) card. The second is smart card is a plastic card equipped with microchip on which funds can be pre-loaded and later used to make instant payments. The smart card is also called a chip card.

The third is credit card this is other form of EPS where cards are issued to the clients by the monetary organization for making online payments. It is an electronic payment system where certain cash measures are kept away from the customer's gadget and made open for online transactions. The fourth is electronic cash can also be described as cash in digital form; it uses a pre-installed e-cash software on the client's PC to facilitate transactions. **(Mostafa A.ALI, Electronic Payment Systems: Architecture, Elements, Challenges and Security Concepts: An Overview, 2019)**

2.4.3 The commonly used of electronic payment systems

In the world today, the major impact of the internet is the ability to move businesses from place to place over a website. This is why people can easily buy items from the internet via several payment gateways. Payment service provider are organizations that facilitates marketing-related online services; they regulate electronic payments by monitoring financial exchanges between sellers and buyers. **(Mostafa A.ALI, Electronic**

Payment Systems: Architecture, Elements, Challenges and Security Concepts: An Overview, 2019)

2.5 Related works

(Janjua, 2014) prepared Islamic finance and insurance are penetrating in international markets especially after world economic crisis since 2008. This research is an attempt to analyze customers' satisfaction for the services of conventional and Islamic insurance companies in Pakistan. A modified SERVQUAL model is used to measure the service quality in the constructs of reliability, responsiveness, empathy, convenience and Sharī'ah compliance. For this purpose primary data of 400 customers, 173 from conventional and 227 from Islamic insurance companies, is estimated through propensity score matching as well as linear, non-linear and non-parametric classification techniques. The results on service quality indicate significant gap between expectation and perception of overall insurance industry. No significant difference of service quality is found between conventional and Islamic insurance companies in the constructs of reliability, responsiveness, convenience and empathy. The findings suggest a significant improvement in the service quality of conventional and Islamic insurance industry. Particularly, the conventional insurance companies need to focus on young people, private employees and lower income groups, whereas the Islamic insurance companies have to put more efforts to improve Sharī'ah compliance and to attract self-employed and higher income groups.

(Bhattarai, 2020) Prepared cloud computing will be unavoidable in the future soon; however, currently, an increasing trend has been seen in all types of industries around the globe, whether the economy is developing or developed. Among the various global enterprises, the insurance industry provides services at an international level with integrated activities and tailored series that explain and justify their need to move to

the cloud. Transitioning to cloud computing is a serious decision that the company cannot make alone. Many actors need to play a positive and supportive role in making this project a success. Among the various actors of an organization, PSP is one that may provide expert support. Thus, the third-party service provider's selection decision is crucial, and the insurance company needs to have a particular model to select. This article had the aim to propose a model and was able to conclude with a model leaving an open discussion.

(vicanshah, 2020) we presented an integrated framework that supports the automation of BPs in the presence of heterogeneous SaaS applications' functionalities. We proved that the integrated framework brings distributed capabilities for business operations to the unified platform. The approach introduces efficiencies and optimization for the BP orchestration and automation even during the volatility of digital channels and corresponding advancements. With the DAIM properties allows RTEs to evolve relationships between existing or new BPs with new or updated SaaS functionalities at runtime without impacting business continuity. The DAI Model Manager (DMM) presents autonomy, reactivity, adaptivity, cooperation, linking, and proactivity to operate the RTE through runtime performance evaluation of the SaaS functions towards BP's KPIs. The DAIM technique using the integrated framework in this paper provides a mechanism that is industry neutral, compatible with multifaceted SaaS application, and scalable. There are different classes of DA and SaaS functions, and each determines the continuous evolvement of BP automationin the presence of volatility of the marketplace due to digitalization. The DAI runtime engine assists enterprises by investigating the effects of external and internal digital activities in the context of the BP and SaaS functionalities.

(consulting, 2020) Prepared the insurance companies have been relatively cautious about cloud adoption. However, the conversation among insurers has changed in the last few years, moving to "when and how" rather than "why." Several factors are driving today's insurance companies to move their applications and data into the cloud as they reassess their business opportunities. These factors include: • The need for increased agility • Access to disruptive technologies that promote innovation • The need for technology operating efficiencies • The possibility of reducing infrastructure costs For insurers navigating a complex risk, regulatory and compliance landscape, adoption of cloud comes with multiple challenges affecting a range of stakeholders, in addition to the off-premise cloud transition challenges of data privacy, architecture, system interfaces and IT security, among other critical elements.

(Hussien Abdulatif1*, 2020) The motive of this paper is to identify the extent and characteristics of Cloud Computing adoption in Sudanese universities and higher education institutions. The study assessed Cloud Computing uses in terms of actual use of cloud services and applications, ability of transition from conventional systems to cloud computing technology, and efficiency of the technical staff of IT to deal with modern technologies. The adoption of the Cloud Computing services in higher education in Sudan was relatively low. The results showed that here is a significant relationship between the adoption of Cloud Computing in Sudan and the four independent variables; (Basic knowledge of cloud computing services and applications, the actual use of cloud computing technology, ability of transition from conventional systems to Cloud Computing Technology and skills of IT human resources) at level of significance $\alpha = 0.05$.

(parvane hsalatini, 2014) Prepared the Examine theoretical relationship between the level of ICT impact on insurance industry in selected average income countries1 by using panel data for the period 2002-2010. Electronic insurance leaded to developments in ICT. The usage of ICT in insurance industry increased production capacity, specialization of activities and improved speed and quality of services. In general perspective, electronic insurance provided customers access to insurance services by using safe intermediates and without physical presents.

(olajidesolomonfadun, 2013)prepared the impact of Information and Communication Technology (ICT) on insurance companies' profitability. It identified the imperatives for adoption of ICT to promoting efficient and efficient service delivery in the insurance industry as a strategy for attainment of the profit maximisation objectives of insurance companies in Nigeria. The study is an empirical design which utilises responses of structured questionnaire of 152 respondents from 18 insurance companies to explore the impact of ICT adoption on quality of service delivery and profitability of insurance companies in Nigeria.

Also prepare a positive relationship between ICT adoption and insurance companies' profitability in Nigeria. This implies that adoption of ICT by insurance companies can enhance their efficiency, their quality of service delivery, and their profitability. The implication of the findings for practice is that insurance companies should endeavour to update their ICT facilities regularly, in view of its impacts on quality of service delivery and profitability.

The paper also highlights the need for regular training of insurance personnel to keep them abreast of the current innovations in the use of ICT to ensure that the industry contribute positively to the economy. Using structured questionnaires of 152 respondents from 18 insurance

companies,the data were processed with IBM SPSS V19 Software, and the hypothesis was tested with Pearson correlation.

(conrad m. mubaraka1, 2000) They developed a website in E. Africa Insurance Company they create awareness of information about insurance mode of operation, policies and benefits. Using qualitative research methods like interview and document review they foubd need to develop and E-insurance system to create awareness about insurance to the public. The qualitative research method led to the derivation of the requirements need to develop the E-insurance system.

The E-insurance system was developed using PHP, WAMP and MySQL. The data is stored in the insurance database and access to specific information for example viewing of claims is done by authorized users through a secure web interface. The database was designed using MySQL. The user interfaces were designed using html, JavaScript, CSS, PHP and JQuery.

(ibrahim, 2013) Designed a system and a website for Al Baraka Insurance Company Ltd., where the company's information is presented. The study focused on offering the services of the company without providing interaction and providing services to the customer and help the employees to perform their work quickly, efficiently and effectively, the correspondence was only by e-mail.

(mohamed ahmed omar, 2015) Designed a management system for the Islamic Insurance Company .The study focused on the design of an administrative system for the Islamic Insurance Company adopted the language of Visual Basic in the design of the screens defect study that he designed a management system on the local server and will not be accessed through the Internet.

(h.abuarra, 2018) Prepared the impact ofIT on performance improvement Insurance companies by examining the impact of information technology on both "growth Sales, market share, customer satisfaction, Creativity and education. The other purpose of the study was to identify the differences in the levels of application of information technology and to identify the performance levels used by the insurance companies according to the demographic variables (scientific qualification, job, number of years of experience, company name).

The results of the study showed that the insurance companies seek to provide computers, equipment and tools for their employees to carry out their work with the required speed and precision and to provide accurate and error-free databases to facilitate the access of their employees.

Results also showed that insurance companies have effective communication networks to link all departments to each otherFacilitating and facilitating the transfer of information, as well as developing communication networks periodically and providingSecurity and protection means for their networks.

The researcher designed a specific questionnaire to achieve the objectives of the study, so that 98 questionnaires were distributed on a samplea random probability of the school community in the branches of the major insurance companies in the city of Ramallah, because the working environment in the insurance companies is highly similar, and the questionnaire was analyzed using the programStatistical Bulletin.

(dr. p.gkhot, 2013) Paper axis exclusively on the suggestion of the Internet for insurance markets and banking. The insurers faces strategic challenges in utilizing the Web, still hesitant to approve policies online is adding these services slowly to their sites.

E-commerce involves any kind of business or economic activities such as buying, selling, transferring or exchanging products, services or information those are performing through electronic connections. E-commerce has brought about fundamental changes in the methods of business.In recent years, insurance companies throughout the world are actively presenting their services to e- insurance, particularly internet.

E-insurance is the result of evolution in communications and information technology, in other words, it is an insurance operations, which are performed by using internet. The style of life and work are influenced by increasing demand of accessing to internet in order to receive information and services, therefore, the insurance companies could not be indifferent to these requests. The insurance companies could take advantages of new information and communication technologies to provide better services. Meanwhile, e-insurance will reduce the real-time of activity and management costs.

(malik, 2011) Purposed of this paper is to know about the IT usage in the insurance industry and where Pakistan stands in terms of IT adoption at its major institutes like the State Life Insurance Corporation of Pakistan.

The results of this study showed that IT is being utilized aggressively in insurance sector. The State Life Insurance Corporation of Pakistan is also increasingly utilizing Information Technology (IT) since long but its efforts are not properly aligned with its current need and at par with the world. The company is working with old/outdated IT systems products and needs to revolutionize its IT usage to have Web based internet integrated systems.There is a dire need that the company must implement an ERP system to become more competitive.

(michael greineder1, 2020) Presents the generic ecosystem for the insurance industry based on 34 generic roles of traditional financial institutions and

InsurTechs identified by a structured content analysis of the Crunch base data of 956 financial organizations. DT creates new roles for value creation in the insurance industry and, thus, affects the entire ecosystem. The ecosystem shows that robo advisors, big data, or short-term insurance providers penetratethe market and, thus, threaten the value creation of traditional insurance institutions.

To discuss this phenomenon, we developed five strategic implications following seven inter-organizational patterns of the DT [Ri18a] in the insurance industry, such as the development of a customer-centric voice through the aggregation of intermediaries or the integration of new services in the creation of customer ecosystems. Our work contributes to the literature on InsurTech and to the growing body of knowledge on DT. We encourage traditional insurance institutions to actively experiment with innovative technologies or to collaborate with emerging new players in the market.

(akpojarond, 2014) Present a complete review of the different categories of electronic payment systems in terms of online payment processes, authentication mechanisms, and authentication types. The paper further demonstrates the application of the different authentication mechanisms and types in the categories of the electronic payments system highlighted.

Finally, analysis reveals that electronic payment systems with authentication mechanisms involving two or more authentication factors tend to be more secured, reduced fraud vulnerability, and boost users' confidence in using electronic payment systems. Future work combines the above discussed authentication mechanisms, in particular, the three-factor authentication model; including biometric (finger-vein) to design an enhanced algorithm for electronic payment systems whose

authentication’s capability would surpass the existing online payment applications.

(mohamed, 2019) This paper found that electronic payment in Sudan is still far away from what many countries of the world have reached. It was not a solution to the problem of the liquidity crisis which Sudan is going through at the present time.

There are many challenges facing the future of technology in Sudan, which consist in a weakness of infrastructure whether network infrastructure or hardware and software infrastructure, technical awareness, security challenges, political and economic challenges.

Also there are many opportunities to improve the level of electronic payment in Sudan if the recommendations of this research are taken into consideration.

Therefore, we would like to draw the attention of all officials and workers in the Central Bank of Sudan, EBS and the Ministry of communications and information technology and all those involved in this field to endeavor to develop the technology and the dissemination of electronic payment compulsory in all public facilities. Also put the responsibility for awareness on all employees and students in the field of computer sciences and IT to dissemination culture their field.

(ogochukwu augustine isimoya, 2018) This study aims to investigate customer’s satisfaction of electronic payments in the purchase of insurance products in Nigeria. A descriptive survey research design was employed. A simple random technique and questionnaire were adopted. 278 participants were drawn within the metropolis of Lagos.

The major statistical method employed for this research work was a Kolmogorov-Smirnov test. Findings show a low level of satisfaction in the customer’s usage of electronic payment systems in the purchase of

insurance products in Nigeria. It was further discovered that insuring populace expressed delight and satisfaction in the delivery of their claims settlement through electronic payment modes.

The research recommends that insurance companies should beef up enlightenment process at integrating the insuring populace with the various electronic payment modes in insurance buying process to allow for greater participation through electronic process; and government on its own part should create an enabling environment for members of the public not to continuously experiencing failure in network and ensure stress-free electronic service delivery.

It educates insurance practitioners of the dynamics of electronic payment systems. It serves as an eye-opener for major plaers in the industry to see reasons why they need to enlighten and train the minds of their respective, even prospective, customers on the need to purchasing insurance products via electronic means customer base. This leads us to suggest that multiple usages be added to e-payment systems with higher economic/social merits so that they can gain a critical customer base. Users will benefit as technologically more capable e-payments are widely adopted for online commerce.

(anas mustafaahmed salim1, 2018) The study aimed at exploring the services provided by the different health insurance schemes in Sudan from the perspectives of insurers. It was found that in spite of the availability of the two insurance types, the country is still far from achieving universal coverage due to financial constraints of the government and lack of affordability by beneficiaries.

Moreover, there are disparities in coverage between formal and informal sector, urban and rural areas and between different states. The benefits packages provided by Social Health Insurance (SHI) and Private Health

Insurance (PHI) are comprehensive, covering primary, secondary and tertiary levels. Such comprehensive coverage might affect the sustain ability of the project and the achievement of universal coverage since most of the finance is provided by Ministry of Finance or Ministry of Health in a country with limited financial resources.

The SHI system has a well-defined gate keeping referral system and medicines policy which might reduce moral hazards. But this system is inconvenient regarding obtaining approval letters from the counties for several types of services. Automated electronic system should be implemented in order to avoid this.

The study showed that insurers have good perception of the quality of services they provide. However, no insurance conducted surveys to assess the quality of services from customers 'perspectives. Resembling PHI in developing countries, PHI in Sudan provides principal coverage rather than supplementary coverage that found in developed countries.

It provides better services compared to SHI especially in terms of the better quality of the private healthcare facilities, automated approval letters and the absence of gate keeping process. Moreover, some packages involve treatment coverage outside Sudan. However, PHI is much costly compared to SHI and has ceilings for each type of service. Moreover, its main consumers are limited to those with high income or those insured by their private employers.

(igorcopandurski, 2010) Presented great number of the world insurance companies, including the Macedonian insurance companies, use heterogenic ICT systems which have diverse types of storing and procession information. Exchanging information between companies or/and the national bureaus for insurance usually must be done manually. The main idea of this research is to manifest the global use of service

oriented ICT systems in cooperation with insurance business processes and reduce the processing time.

The new ICT systems must extract all the benefits of the past, present, and future investments and to create essential advancements. The insurance companies reduce process time up to 30% by employing reusable business services through a service oriented structure i.e. web services and software agents as basic representatives of the new ICT systems.

(Samson Ifejionu NwankwoI, 2016) This research attempts to examine the implementation of electronic payment systems in service delivery of insurance companies in Nigeria. While the study proves an improvement in electronic payment systems in relation to service delivery process within the Nigerian insurance market space, it was discovered that electronic payment have not been fully accepted within the Nigerian insurance industry.

2.6 Summary

Chapter explained introduction, introduction to cloud computing, cloud computing, the backdrop of technology, features of cloud computing, types of cloud computing, electronic commerce, types of electronic commerce, electronic commerce advantages, electronic commerce disadvantages and electronic commerce in sudan.

Also include electronic payments definition, Types of electronic payment systems based on electronic transaction, Types of electronic payment systems based on electronic transaction, Types of electronic payment systems based on Internet-based payment system, the commonly used of electronic payment systems also included related work.

CHAPTER THREE
Methodology

CHAPTER THREE

Methodology

3.1 Introduction

These chapter one of the most important stages in the process of establishing systems, the strength of the system depends largely on this stage, as the accuracy of work at this stage leads to effective design.

This stage aims to collect information about the old system and analyze it, through one of the methods of collecting information to use it to define the problem and solve it later, so that we can design the system data were collected at this stage through questionnaires with the taawuniya insurance company clients from various insurance categories.Unified Modeling Language (UML) was used in this research to better understand, alter, maintain, or document information about the system.

4.1 System analysis

Systems analysis is a process of collecting factual data, understand the processes involved, identifying problems and recommending feasible suggestions for improving the system functioning.

This involves studying the business processes, gathering operational data, understand the information flow, finding out bottlenecks and evolving solutions for overcoming the weaknesses of the system so as to achieve the organizational goals.

System Analysis also includes subdividing of complex process involving the entire system, identification of data store and manual processes. The result of this process is a logical system design.

5.1 The major objectives of systems analysis

It is to find answers for each business process, what is being done, how is it being done, who is doing it, when is he doing it, why is it being done

and how can it be improved?.It is more of a thinking process and involves the creative skills of the System Analyst. And It attempts to give birth to a new efficient system that satisfies the current needs of the user and has scope for future growth within the organizational constraints. **(INTRODUCTION TO SYSTEM ANALYSIS ANA DESIGN)**

6.1 Questionnaire

A questionnaire is a research instrument consisting of a series of questions for the purpose of gathering information from respondents. Questionnaires can be thought of as a kind of written interview. They can be carried out face to face, by telephone, computer or post. Closed questions structure the answer by only allowing responses which fit into pre-decided categories. Closed questions can also provide ordinal data (which can be ranked). This often involves using a continuous rating scale to measure the strength of attitudes or emotions. For example, strongly agree / agree / neutral / disagree / strongly disagree / unable to answer.

The strengths of questionnaire is the respondent provides information which can be easily converted into quantitative data (e.g., count the number of 'yes' or 'no' answers), allowing statistical analysis of the responses. The questions are standardized. All respondents are asked exactly the same questions in the same order. This means a questionnaire can be replicated easily to check for reliability. Therefore, a second researcher can use the questionnaire to check that the results are consistent. **(McLeod, 2018)**

3.2.1 Methodological framework for the study

In order to be able to know the effect of the quality of the insurance service provided by the taawuniya insurance company on the satisfaction of its customers, and since the quality of service represents the

independent variable, and customer satisfaction represents the dependent variable, the questionnaire method was used by asking a group of questions to the clients of this institution in the form of special phrases Dimensions of insurance service quality and customer satisfaction, and to analyze the questionnaire we used for this purpose Statistical Package for social sciences (SPSS) v 1.0 program.

The first requirement is to determine the population and sample of the study, first, determine the population of the study, since the aim of the study is a survey of the customers of the taawuniya insurance company to know the effect of the quality of insurance services provided by the institution on their satisfaction, the study population included the total customers who dealt with this company during the months of November and December of the calendar year 2020, and they are the customers who are supposed to be affected by the level of quality Services provided by the taawuniya insurance company.

Second, choose the type and size of the sample in our study, the intentional sampling method was adopted in determining the study sample, and this is to find out the opinions of the target community, and it is a sample that is treated in the same way as the random sample, considering that the respondents have the same characteristics, and this type of sample is consistent with the nature of our study, and the sample included: (70) clients That is, the sample size is (70) individuals, and it has been taken into account that the customer is dealing with the taawuniya company during the calendar year 2020, and in order to ensure the reliability of the answers, it was taken into consideration that the questionnaire was delivered hand in hand to the customer during his visit to the headquarters of the taawuniya insurance company after receiving

the service Then he explains to him how to fill out the questionnaire, explaining the phrases it includes, and then he answers the questions.

The second requirement is to collect data and information tools in this study, we relied on a questionnaire to collect sample data from the taawuniya insurance company's customers. The following steps were followed to build and design this questionnaire on a set of previous studies related to the subject of the study, and to make use of them in constructing and drafting the paragraphs of the questionnaire, trying to set a set of phrases to cover each dimension from the dimensions of the study.

The questionnaire was divided into two main parts, the first part related to objective data and it has two axes, an axis related to the quality of the insurance service, and it contains phrases related to the dimensions of the quality of the insurance service, which represent the independent sub-variables of the study, and another axis with phrases related to customer satisfaction representing the dependent variable, and the second part is related to the personal data of the customer that includes a group of the phrases relate to gender, age, educational level, and profession.

Our goal in designing the questionnaire was to determine the impact of the quality of insurance services provided by the company under study on the satisfaction of its customers, and in order to evaluate the responses of the customers of the cooperative company, a five-point Likart scale was used, for expressions describing the subject to which the individuals wanted to assess the direction of individuals towards it, and the individual the respondent selects an answer for each of the phrases, by choosing the answer that best expresses his direction, according to the following table:

Table 1:The degrees to the five likert scales

Relative weight	1	2	3	4	5
The opinion	Strongly disagree	Disagree	Neutral	Agree	Strongly agree

The third requirement is the tools of statistical analysis of the study data, in order to carry out the statistical analysis of the study data, appropriate statistical analysis tools were used for such studies, the results of which are obtained directly after unpacking the questionnaire data, through the program of the spss v 1.0 program (Statistical Package for Social Sciences).

Types of statistical methods are the first type is descriptive statistical methods, in which we used the frequency distribution. Through this method, it is possible to identify the frequencies of the answers and percentages, and through it is possible to obtain various graphs that help us in identifying the characteristics of the studied sample, then we used the arithmetic mean in order to know the extent of the concentration of the answers in choosing Specific to the sample members, and we also used the standard deviation in order to find out the extent of the dispersion of the answers for the sample members from their arithmetic mean.

The second type is inferential statistical methods, in which we used the "Alpha s'Cronbach" test in order to know the validity and reliability of the data; Then they used the test-T test, and also the ANOVA Way-One test to find out if there were statistically significant differences towards customer satisfaction attributed to demographic variables, then we used simple and multiple linear regression in order to determine the effect of

the independent variables. In the dependent variable and then answer the hypotheses of the study.

3.3Description of the current system

In the current system the client goes to the company branch and meets the employee, the employee open the system and fills the forms that used in the insurance operation, forms contain branch data, date of insurance, the period time of insurance, client data and motor data and fees data, then client pays the insurance fees and receives the insurance policy.

7.1 The current system problem

- Difficulties in insurance procedures because it is depend on employees and train them to use computers.
- Wasting time for the customer to go to the company branch and pay the fees manually.
- Unavailability of insurance service around the clock.

3.4Objectives of the proposed system

- To investigate islamic insurance services in sudan.
- To automate an electronic payment system based on Software as a Service (SaaS), to pay islamic insurance services at any time.
- To evaluate an electronic payment method, to increase the number customers and increase company sales.

3.5 Description of the proposed system

Will designing a website system the client will be able to pay their insurance fees anytime, anywhere, when connected to the Internet.

The client can interact with the company website by entering its user name and password by registration and login to website. Then the client can search car by plate number in the database and add car details, it is first stage of insurance .

The client can requested to new policy and complete entering data by request Policy. Also client can choose the electronic payment method to pay the system has three types of payment online payment, bank payment and smartcard payment. The client can print policy of insurance details, edit profile and request logout of the website.

3.6 Unified modeling language

Is a diagram based on the Unified Modeling Language (UML) with the purpose of visually representing a system along with its main actors, roles, actions, artifacts or classes, in order to better understand, alter, maintain, or document information about the system.

3.6.1 Use case diagram

A cornerstone part of the system is the functional requirements that the system fulfills. Use Case diagrams are used to analyze the system's high-level requirements. These requirements are expressed through different use cases.

We notice three main components of this uml diagram is the functional requirements represented as use cases; a verb describing an action.

The actors they interact with the system; an actor can be a human being, an organization or an internal or external application and relationships between actors and use cases represented using straight arrows

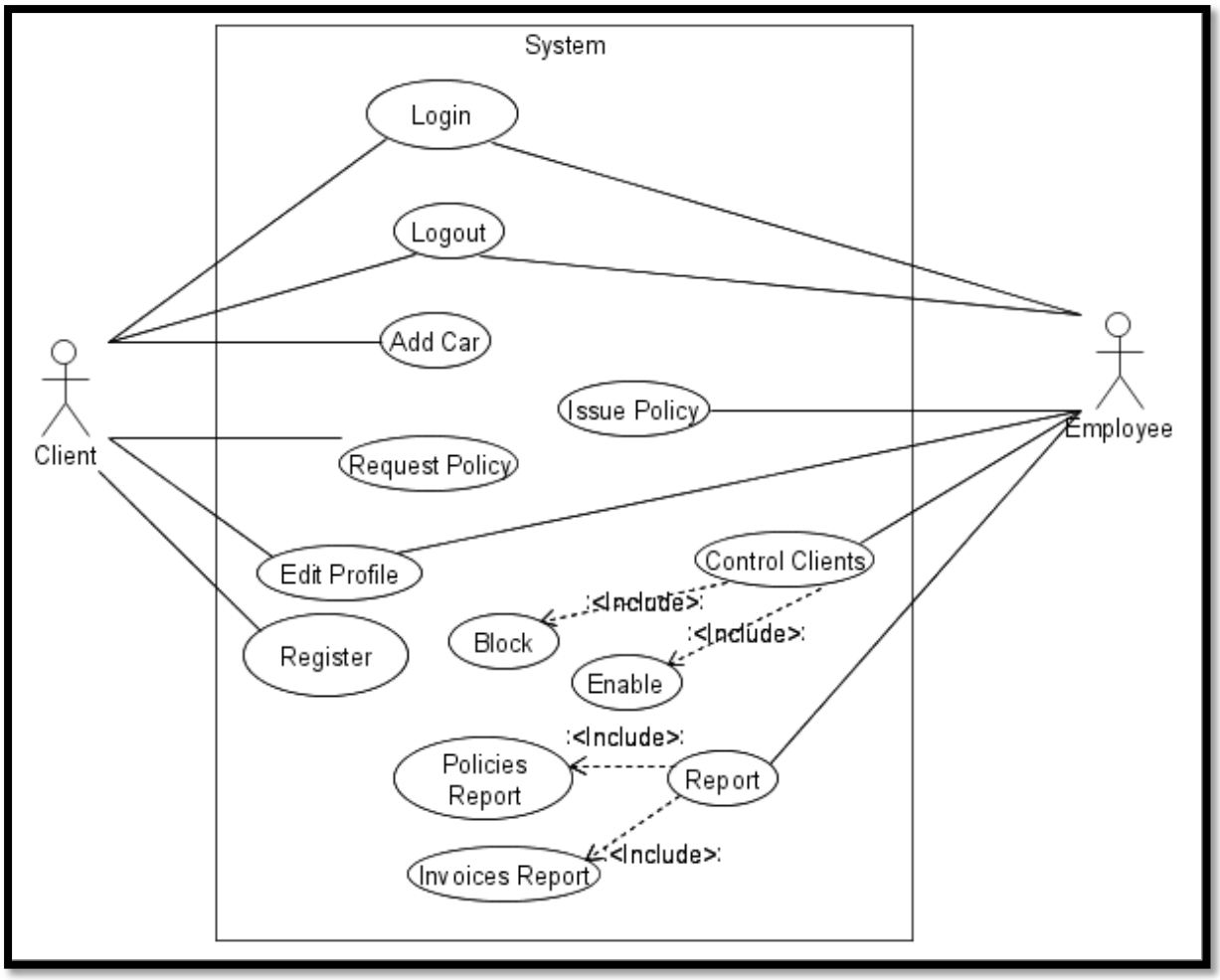


Figure 1:Usecase diagram flow chart

Diagram clarify usecase diagram of the system, client can do register, login, add a car, request policy, edit profile and logout. Employee can do login, issue policy, control clients by blocking and enable accounts, reporting, and logout.

3.6.2 Class diagram

Class diagrams contain classes, alongside with their attributes (also referred to as data fields) and their behaviors (also referred to as member functions). More specifically, each class has 3 fields: the class name at the top, the class attributes right below the name, the class operations/behaviors at the bottom. The relation between different classes (represented by a connecting line), makes up a class diagram.

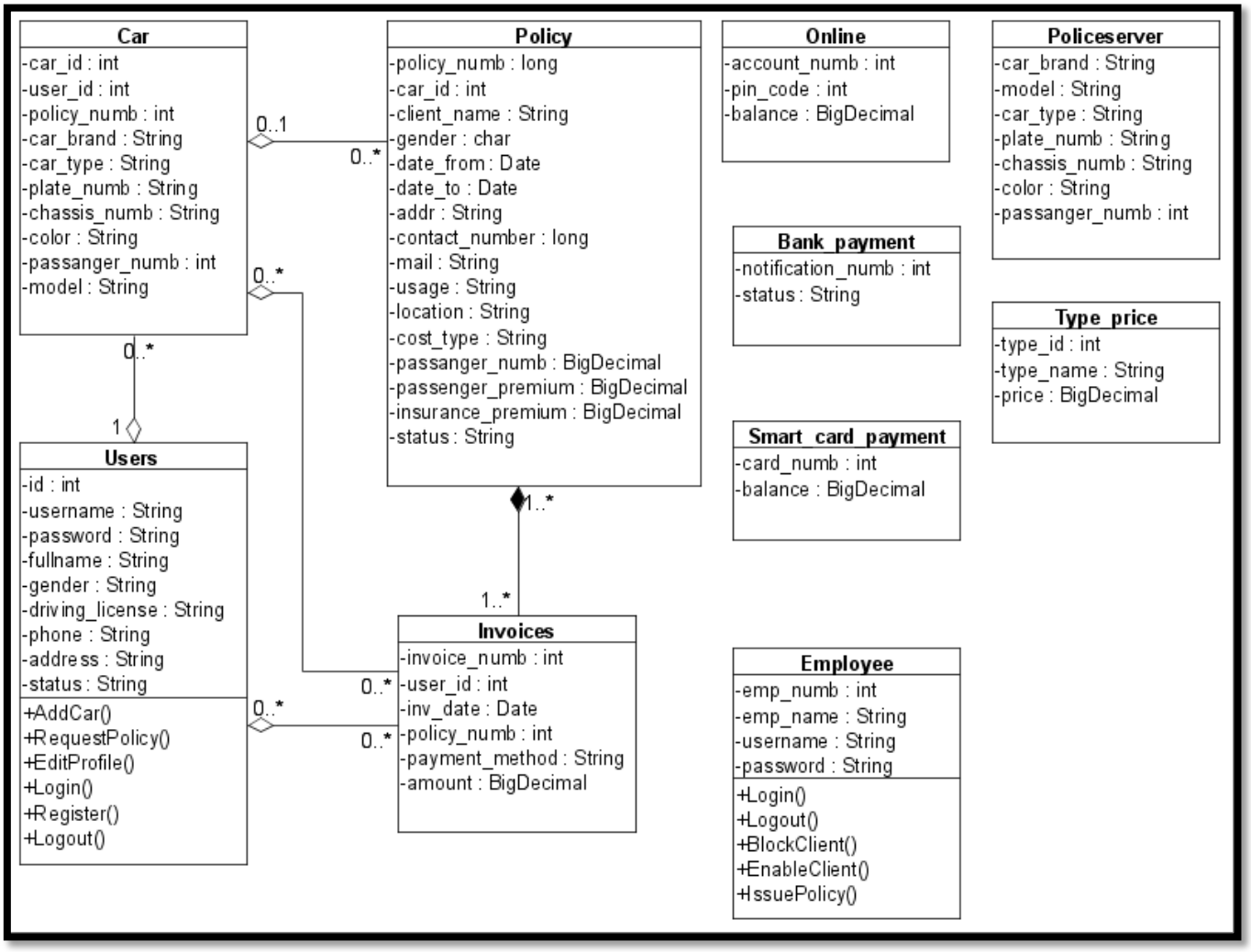


Figure 2: Class diagram flow chart

Diagram clarify the class diagram of the system, the system has car, policy, bank payment, type price, smart card payment traffic police server user invoice and employee classes.

3.6.3 Sequence diagrams

Describe the sequence of messages and interactions that happen between actors and objects. Actors or objects can be active only when needed or when another object wants to communicate with them. All communication is represented in a chronological manner.

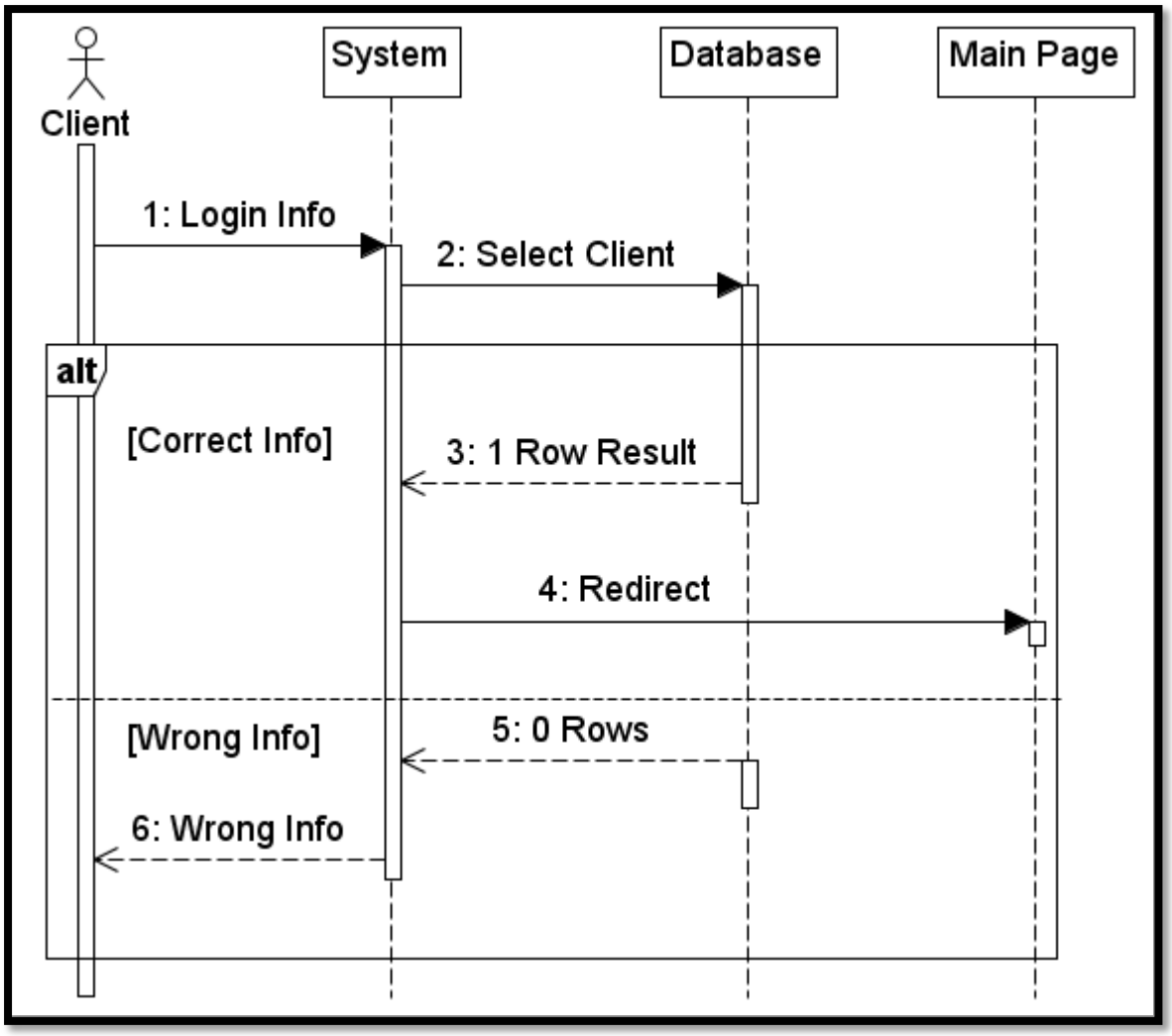


Figure 3: Sequence diagram client login flow chart

Diagram clarify client login diagram the client send login info to the system the system then send select query for database if the login info is correct then the database return client info that we use later then the system redirect client to the main page, the other track is the database can't find the user and return zero rows then the system notice client the info is wrong.

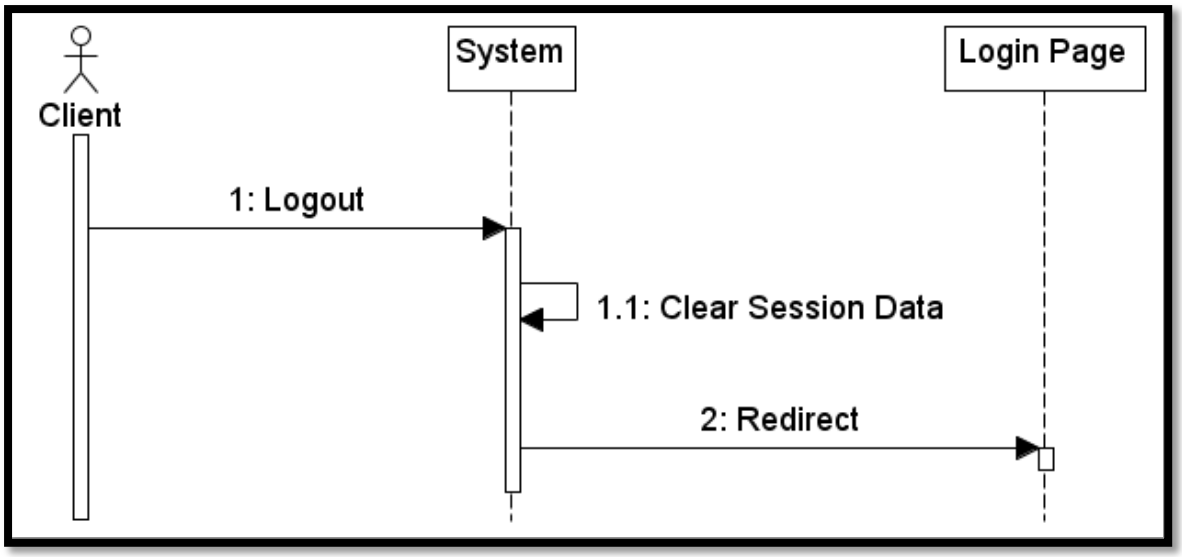


Figure 4: Sequence diagram client logout flow chart

Diagram clarify client logout sequence diagram the client request logout of the system the system clear session data then redirect user to the login page.

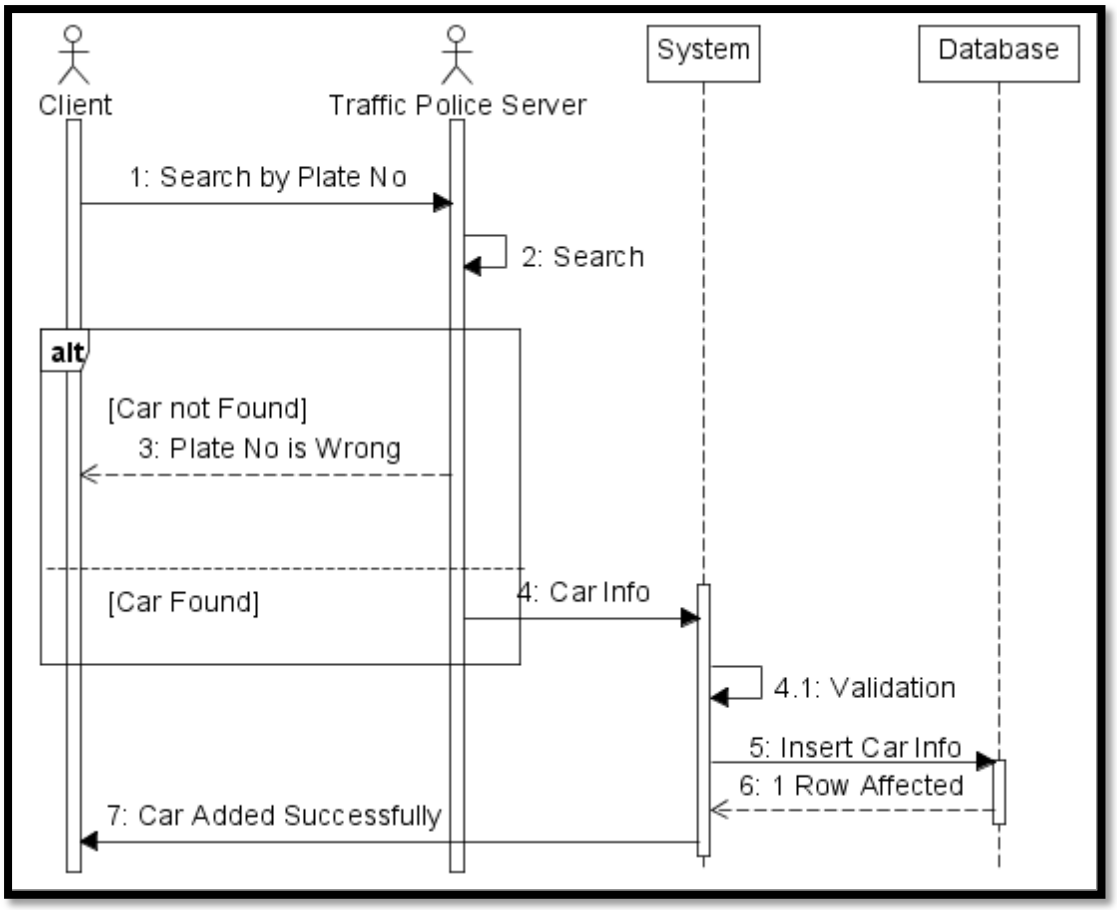


Figure 5: Sequence diagram client add car flow chart

Diagram clarify client add car sequence diagram the client search car by plate number the traffic police server response by the car info if it found or notify the plate no is not correct, if the car found system send insert car data to user cars list the database return affected rows then system notify user that the car added successfully.

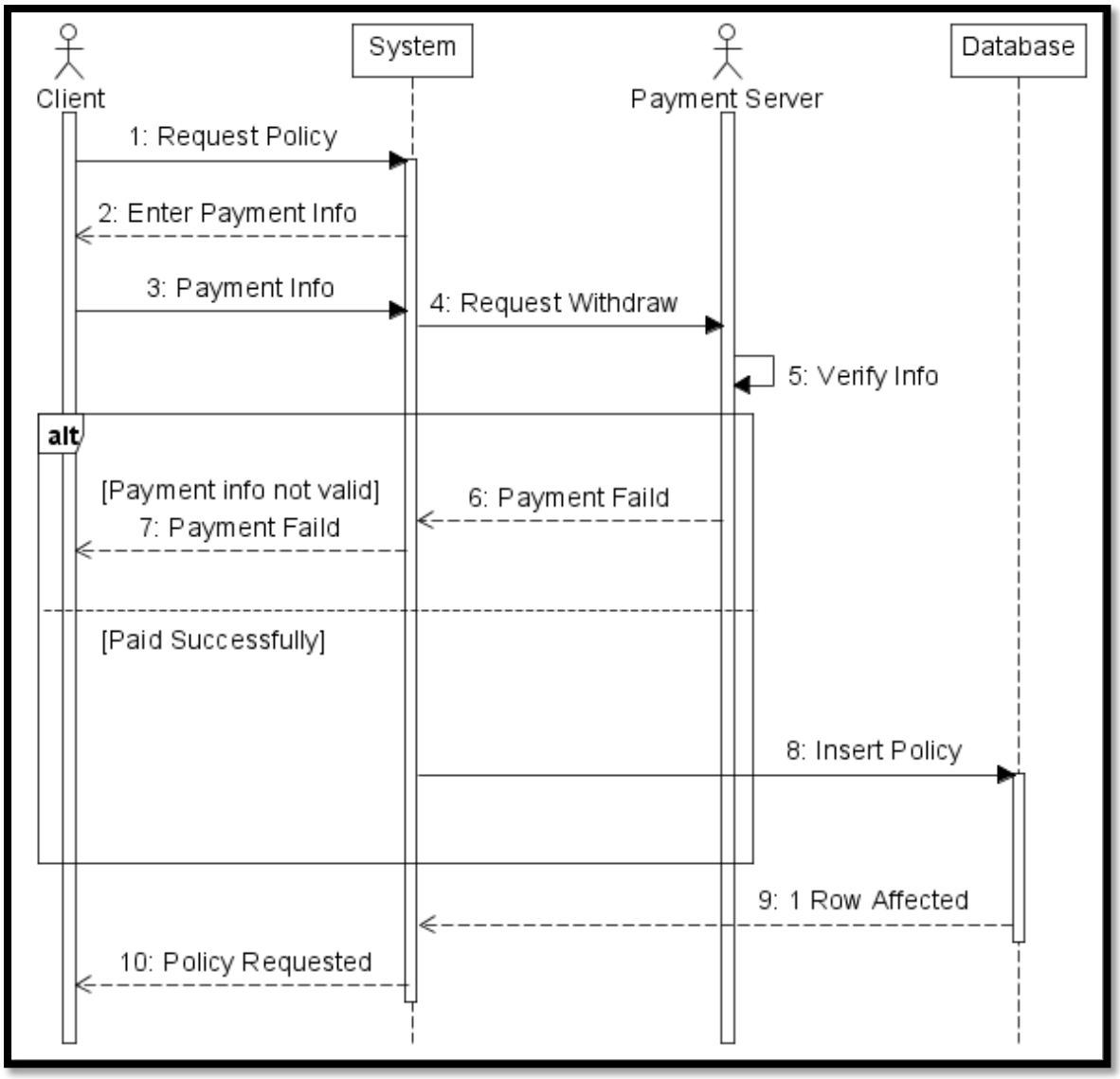


Figure 6: Sequence diagram client policy request flow chart

Diagram clarify client policy request sequence diagram, the client choose a car and request insurance policy, he enter some requested info then client choose payment info, if payment info wrong the payment server notify the client else the system will send policy info to the database and the database response by one row affected at last system notify client his request is done.

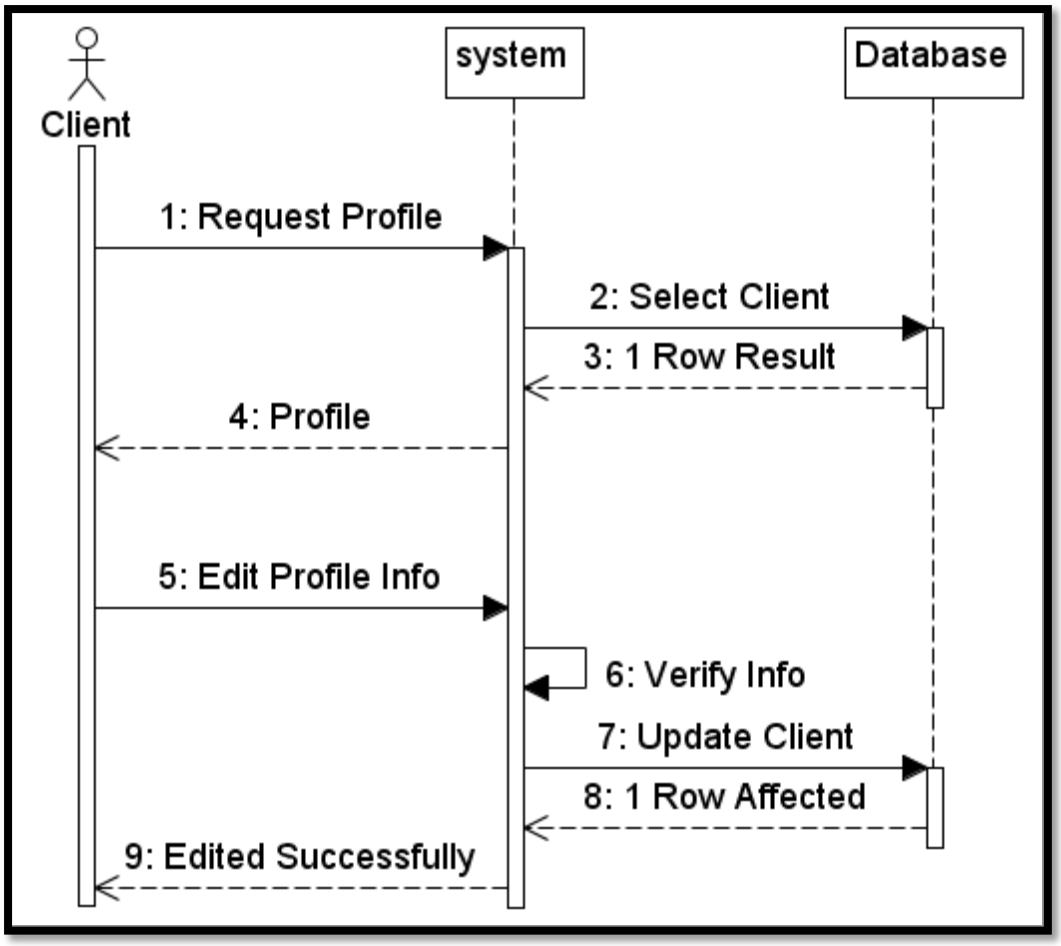


Figure 7: Sequence diagram client edit profile flow chart

Diagram clarify client edit profile sequence diagram, the client open edit profile, the system request client data to show it to the client, the database response by client data then the user edit his data and send it back to the server, the server send update query to the database the database response by affected rows at last system response to client edited successfully

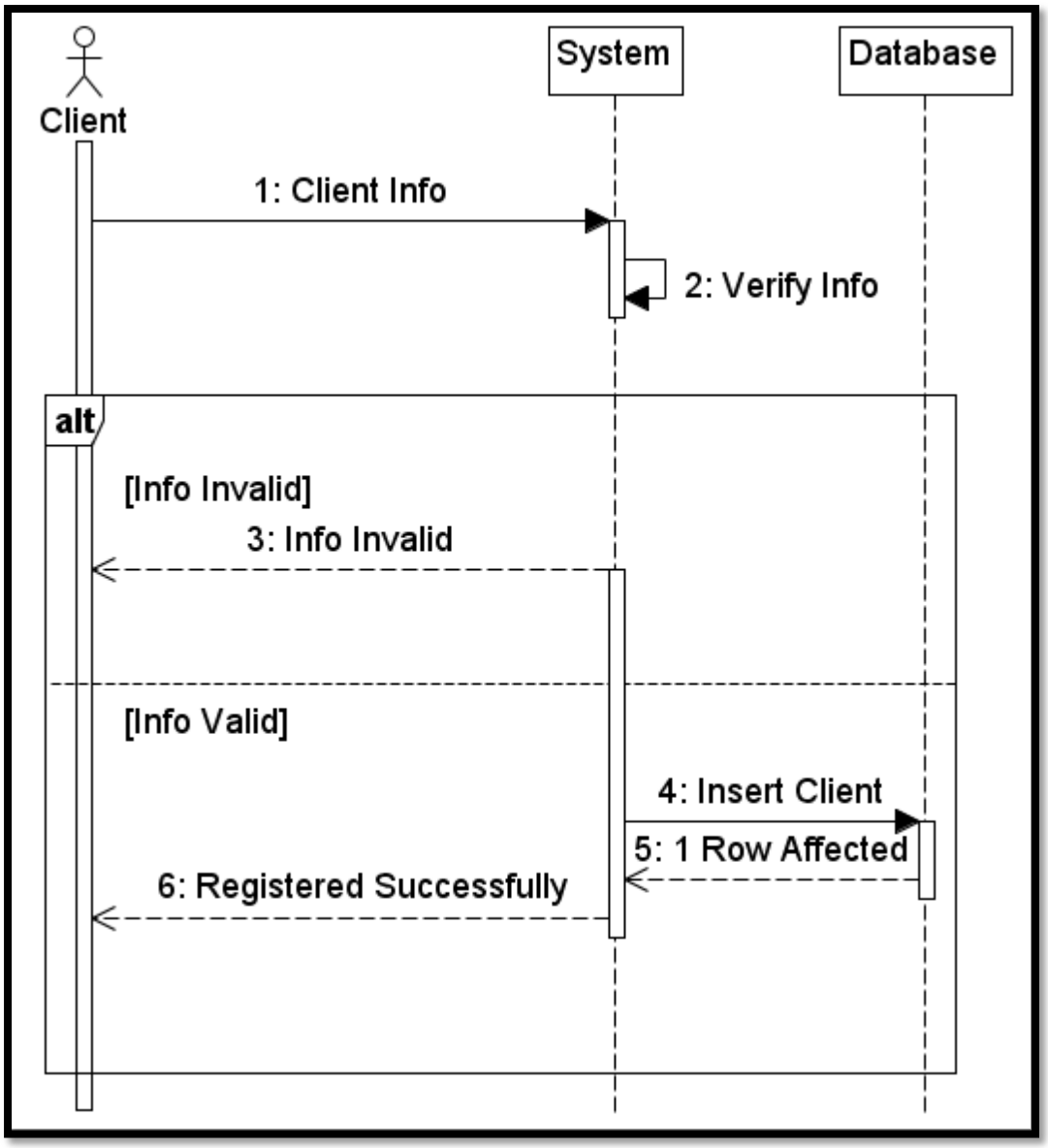


Figure 8: Sequence diagram client register flow chart

Diagram clarify client register sequence diagram, client send data to the system, the system

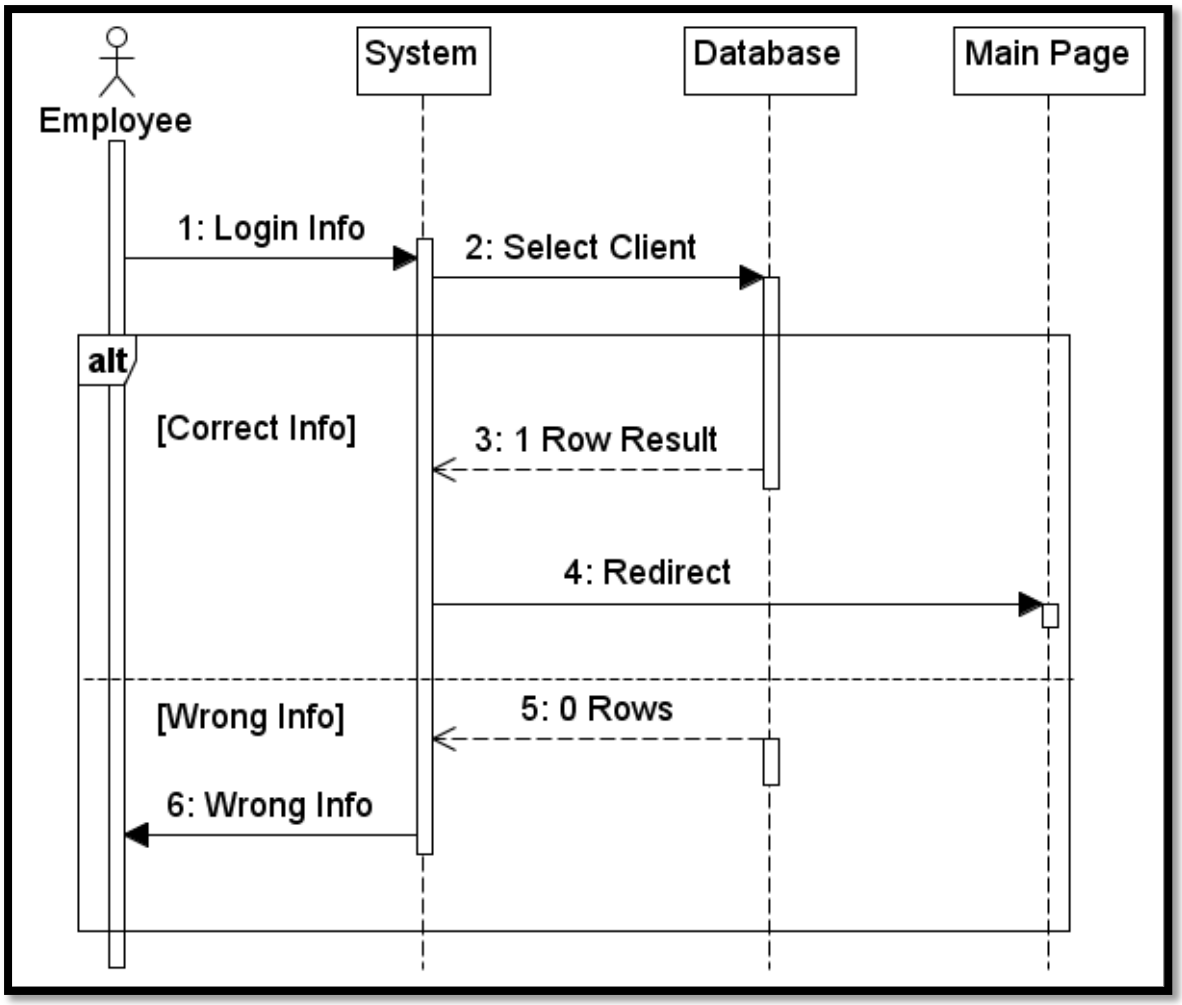


Figure 9: Sequence diagram employee login flow chart

Diagram clarify employee login diagram the employee send login info to the system the system then send select query for database if the login info is correct then the database return employee info that we use later then the system redirect employee to the main page, the other track is the database can't find the user and return zero rows then the system notice employee the info is wrong.

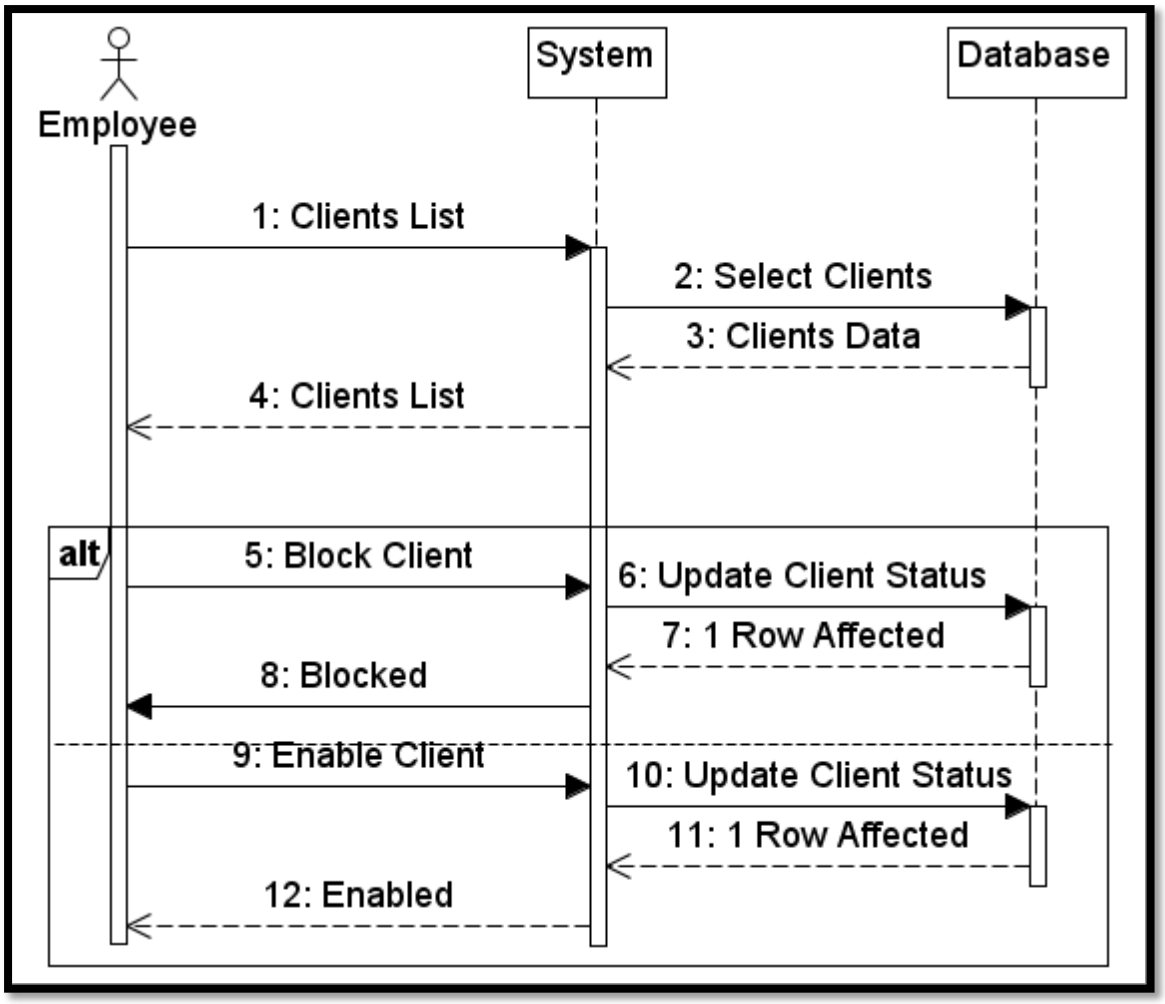


Figure 10:Sequence diagram employee control clients flow chart

Diagram clarify employee control clients sequence diagram,employee request clients list, the system send select query to the database, database response by clients data, system send clients list to the employee, employee block client if client is available or enable client if client is blocked.

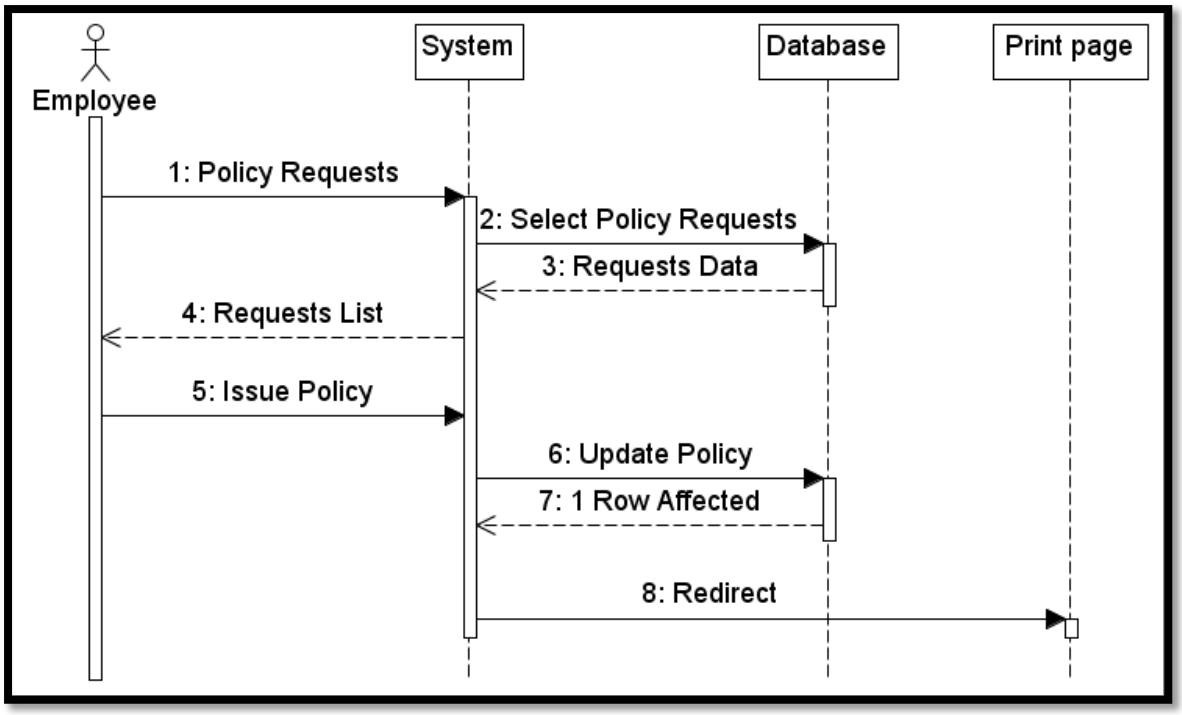


Figure 11: Sequence diagram employee issue policy flow chart

Diagram clarify employee issue policy diagram, employee request policies list from the system, system send select query for new requests, database response by requests list, system send them back to employee. Employee choose on request and issue policy according to the request, then system redirect employee for print page of the policy.

3.6.4 Activity diagram

In software development, it is generally used to describe the flow of different activities and actions. These can be both sequential and in parallel. They describe the objects used, consumed or produced by an activity and the relationship between the different activities. All the above are essential in business process modeling. **(tallyfy)**

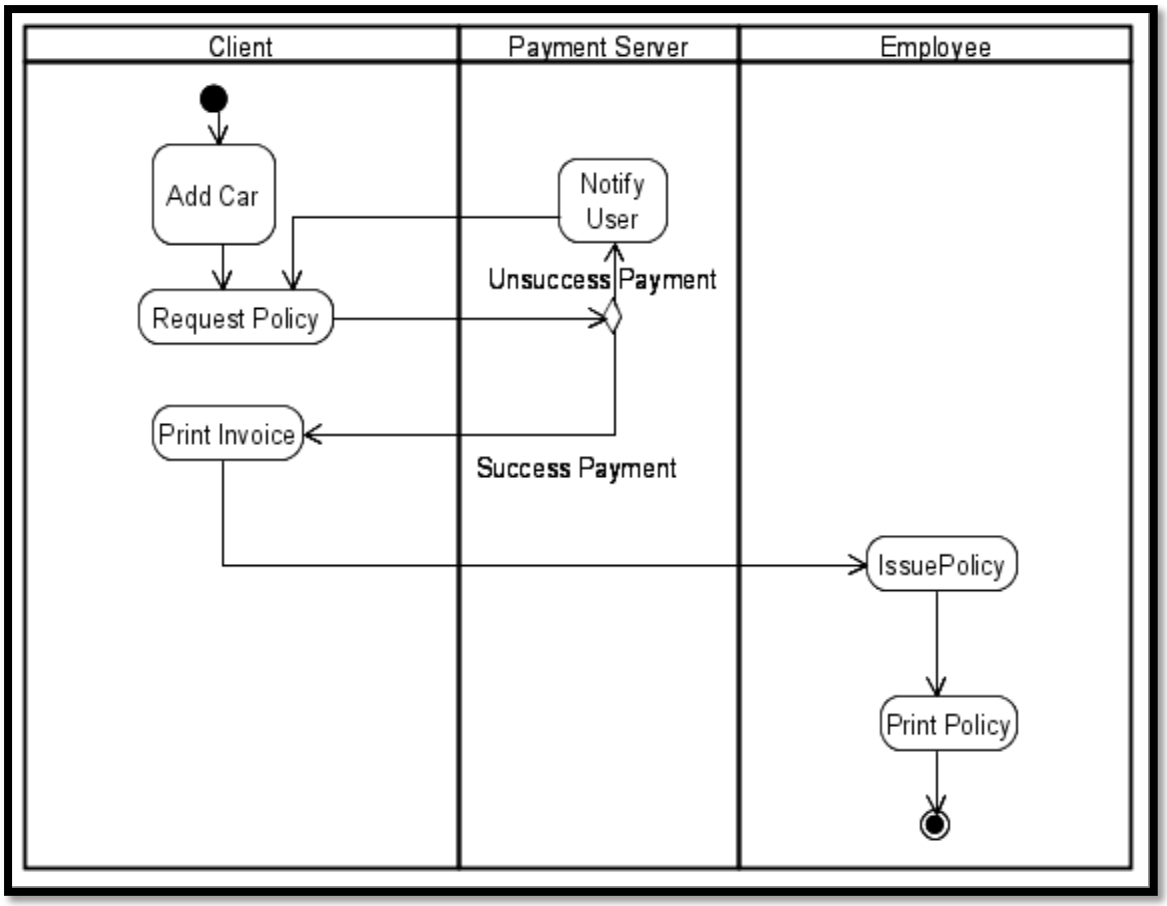


Figure 12: Activity diagram flow chart

Diagram clarify activity diagram of the system, the client open add car to his cars collection, then choose a car, request insurance policy for the car, if payment information is wrong the payment server will notify system and the system will terminate the request, else payment information is correct payment server will notify the system and the system will complete policy request, the company employee then will issue the policy.

3.7 System Security

Is the protection of information and property from theft, corruption and other types of damage, while allowing the information and property to remain accessible and productive. System security includes the development and implementation of security countermeasures.

3.7.1 System security approaches

Firewall system security approach it is one widely used strategy to improve system security is to use a firewall. A firewall consists of software and hardware set up between an internal computer network and the Internet. A computer network manager sets up the rules for the firewall to filter out unwanted intrusions. These rules are set up in such a way that unauthorized access is much more difficult.

Other system security approach is the encryption it is one way to keep files and data safe is to use encryption. This is often used when data is transferred over the Internet, where it could potentially be seen by others. Encryption is the process of encoding messages so that it can only be viewed by authorized individuals. An encryption key is used to make the message unreadable, and a secret decryption key is used to decipher the message.

Also approaches includes passwords it is the most widely used method to prevent unauthorized access is to use passwords. A password is a string of characters used to authenticate a user to access a system. The password needs to be kept secret and is only intended for the specific user. In computer systems, each password is associated with a specific username since many individuals may be accessing the same system. Good passwords are essential to keeping computer systems secure. **(Zandbergen)**

3.8 Research tools

The tools areStatistical Package for Social SciencesV 1.0 program (SPSS), Hyper Text Markup Language (HTML), Hypertext Preprocessor (PHP), Cascading Style Sheet (CSS),visual studio code,visual paradigm for uml, jquery, bootstrap and xampp(apache+mysql).

3.9 Summary

Chapter show the introduction, system analysis definition, objectives of systems analysis, questionnaire and methodological framework for the study. Explained description of the current system, current system problem, objectives of the proposed system and description of the proposed system. Chapter also contain unified modeling language diagrams like usecase diagram, class diagram, sequence diagram and activity diagram.

Also shows the system security approaches firewall, encryption and password. Also explained research tools like, Statistical Package for Social Sciences V 1.0 program (SPSS), hyper text markup language (HTML), hypertext preprocessor (PHP), Visual Studio Code, visual paradigm for uml, Jquery, bootstrap and xampp(apache+mysql).

CHAPTER FOUR

Results and Discussions

CHAPTER FOUR

Results and Discussions

4.1 Introduction

Based on the user requirements and the detailed analysis of the existing system, the new system must be designed. This is the phase of system designing. It is the most crucial phase in the developments of a system. The logical system design arrived at as a result of systems analysis is converted into physical system design. **(INTRODUCTION TO SYSTEM ANALYSIS AND DESIGN)**

4.2 System design

Systems design is the process of defining elements of a system like modules, architecture, components and their interfaces and data for a system based on the specified requirements. It is the process of defining, developing and designing systems which satisfies the specific needs and requirements of a business or organization. **(Indiatimes)**

4.3 System implementation

Research will be implemented by the cloud computing, Software as a Service (SaaS) is used , it is public E-commerce cloud Dropbox, it refers to cloud services that any islamic insurance company in sudan can utilize. Any islamic insurance company using Dropbox is renting a share of its server space, The E-commerce cloud is a shared environment, similar to a big office but every end-user has their own secure desk and cabinet. This secure dedicated space is also called a virtual machine. Virtualization allows for each end-user to have their own virtual machine in a separate secure space on the same physical server. Beyond virtual machines and there can be virtual servers. Virtualization thus makes the best use of the

physical hardware in a server. This efficiency is why cloud services can be used on-demand by any islamic insurance company at a low cost.

4.4 purpose of System Implementation

Implementation is a set of procedures performed to complete the design. **(Open Textbooks).** The purpose is to making the new system available to a prepared set of users (the deployment), and positioning on-going support and maintenance of the system within the Performing Organization(the transition).At a finer level of detail, deploying the system consists of executing all steps necessary to educate the Consumers on the use of the new system, placing the newly developed system into production, confirming that all data required at the start of operations is available and accurate, and that business functions that interact with the system are functioning properly. Transitioning the system support responsibilities involves changing from a system development toa system support and maintenance mode of operation, with ownership of the new system moving from the Project Team to the Performing Organization.

A key difference between System Implementation and all otherphases of the lifecycle is that all project activities up to thispoint have been performed in safe, protected, and secure environments, where project issues that arise have little or noimpact on day-to-day business operations. **(Guidebook)**

4.5 Findings

They are many screens used by the clients and the administrator to access the electronic payment system by the website.

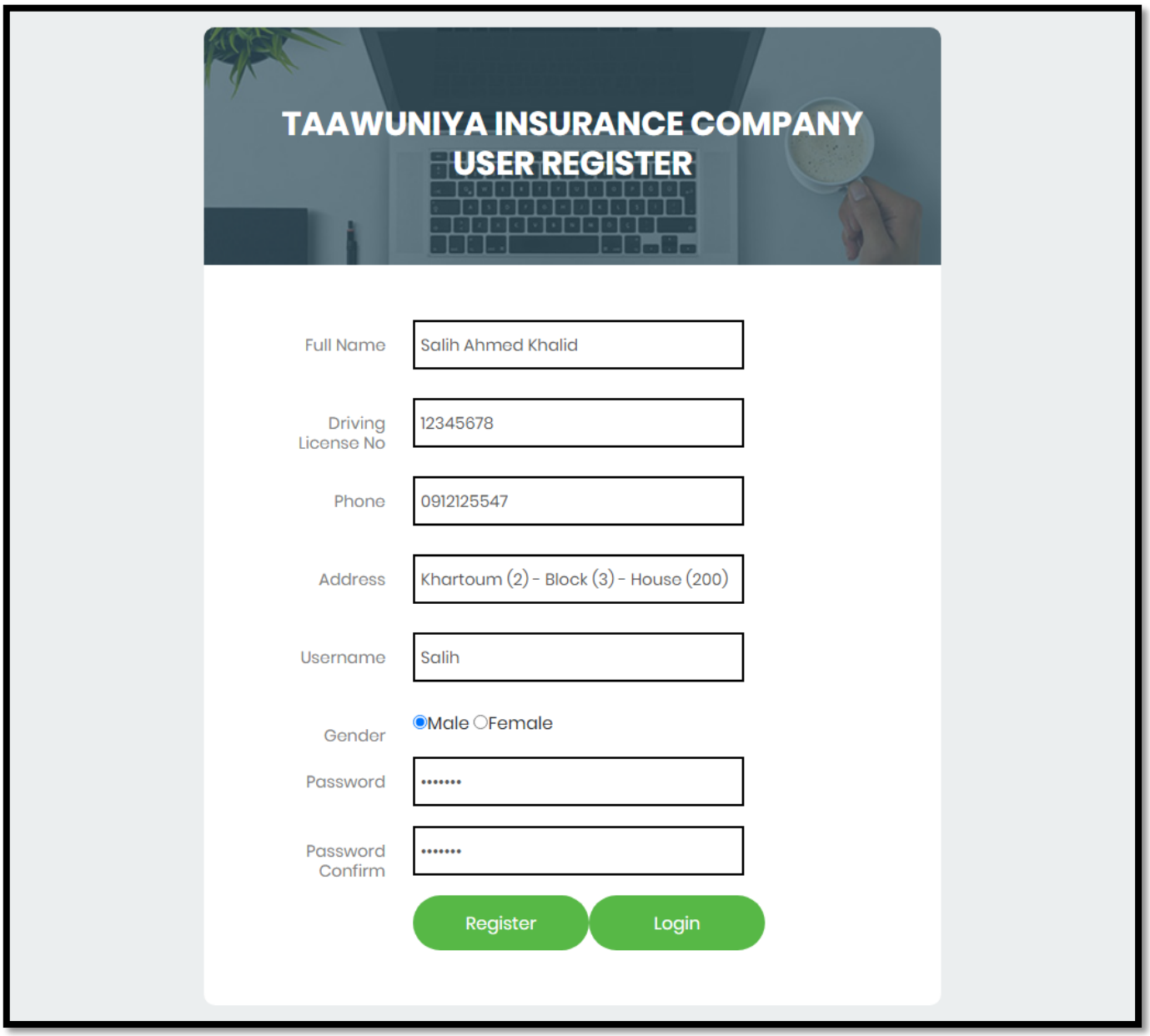


Figure 13: Client register page

Figure (13) shows registration form for company clients, the form contains: client name, driving license number, phone, address, username, gender and password.

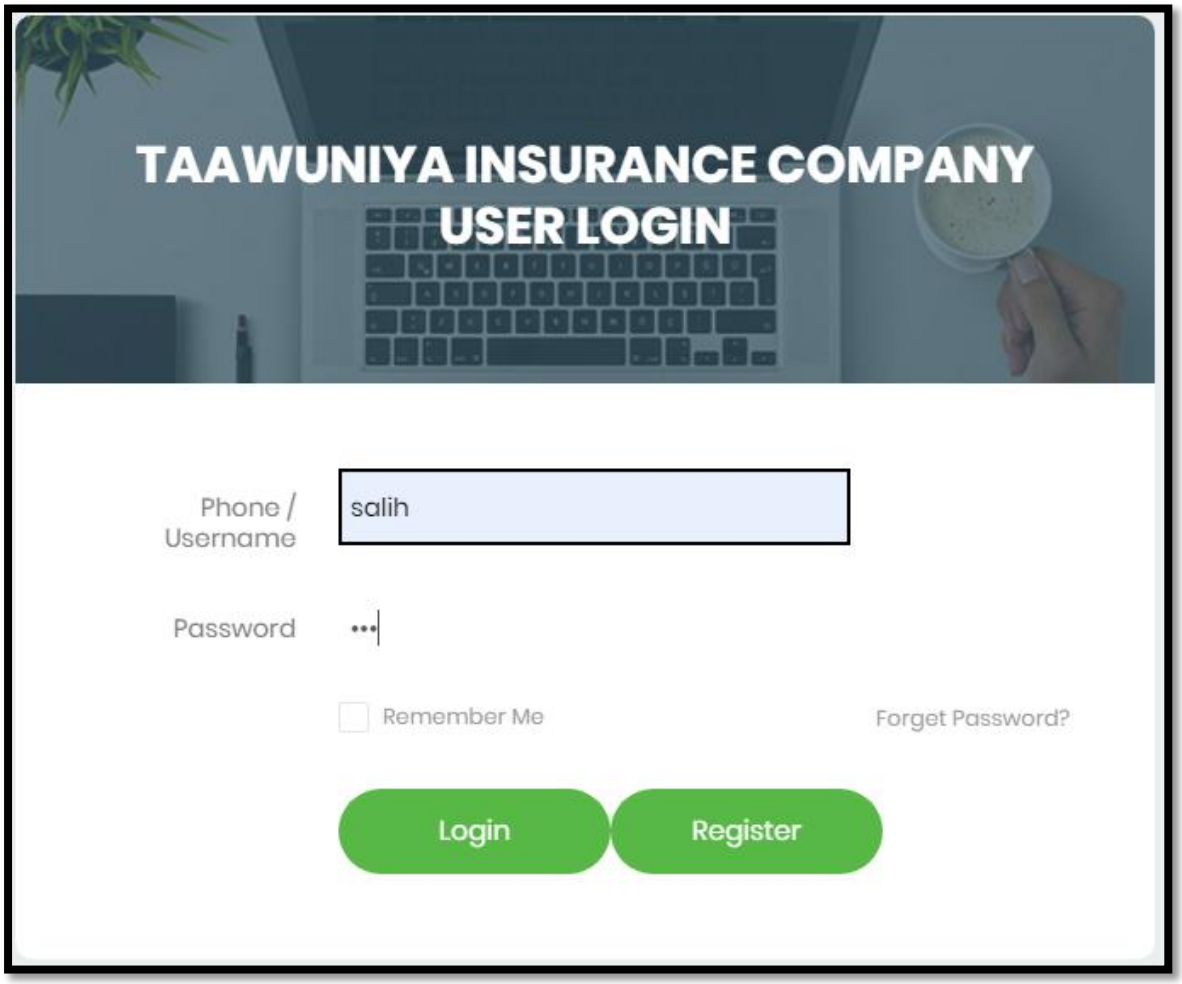


Figure 14: Client login page

Figure (14) shows login page for clients, client will enter his username or his phone and the password he submitted at the registration form and he will be access to his account if he entered correct info, else the system will inform him the info are wrong.

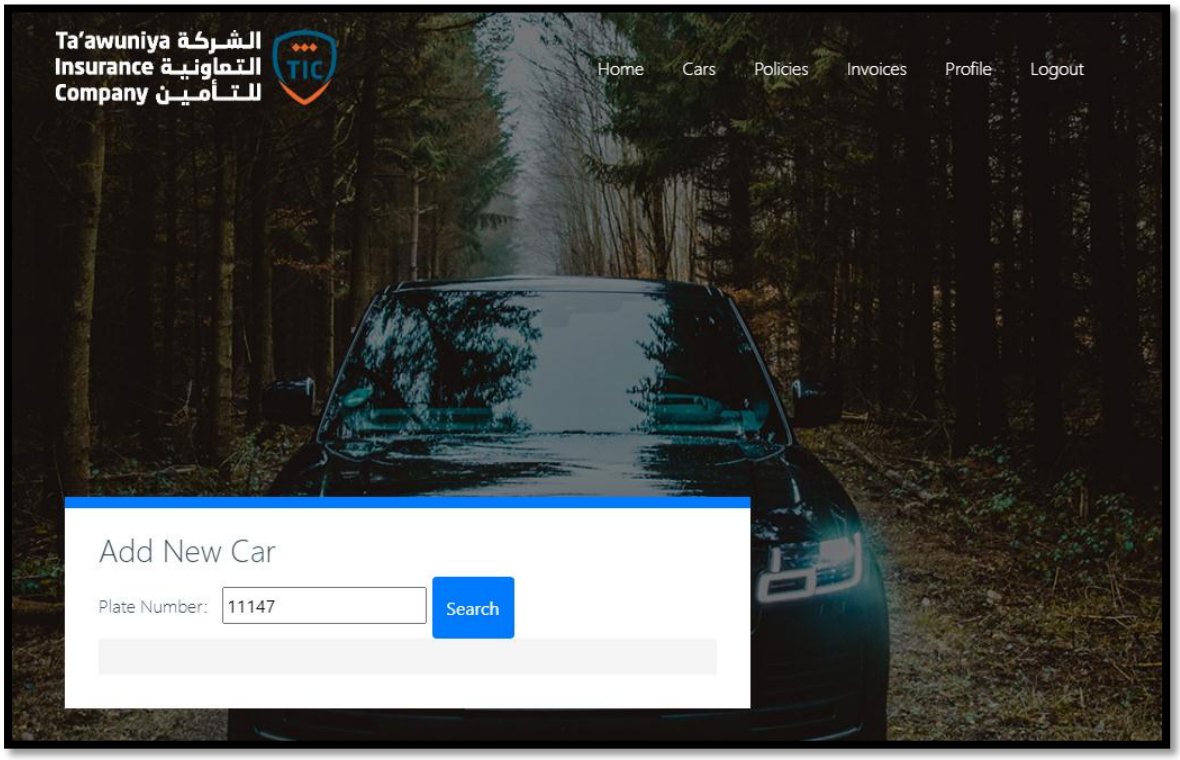


Figure 15: Search car page

Figure (15) showsthe first step in adding the car to client cars list, first the client enter car plate number, then the system will search the car info at the traffic police servers (it the data base off traffic server contain all cars details in sudan, search in it by used plate number) this will end with the second step at adding client car data to the system.

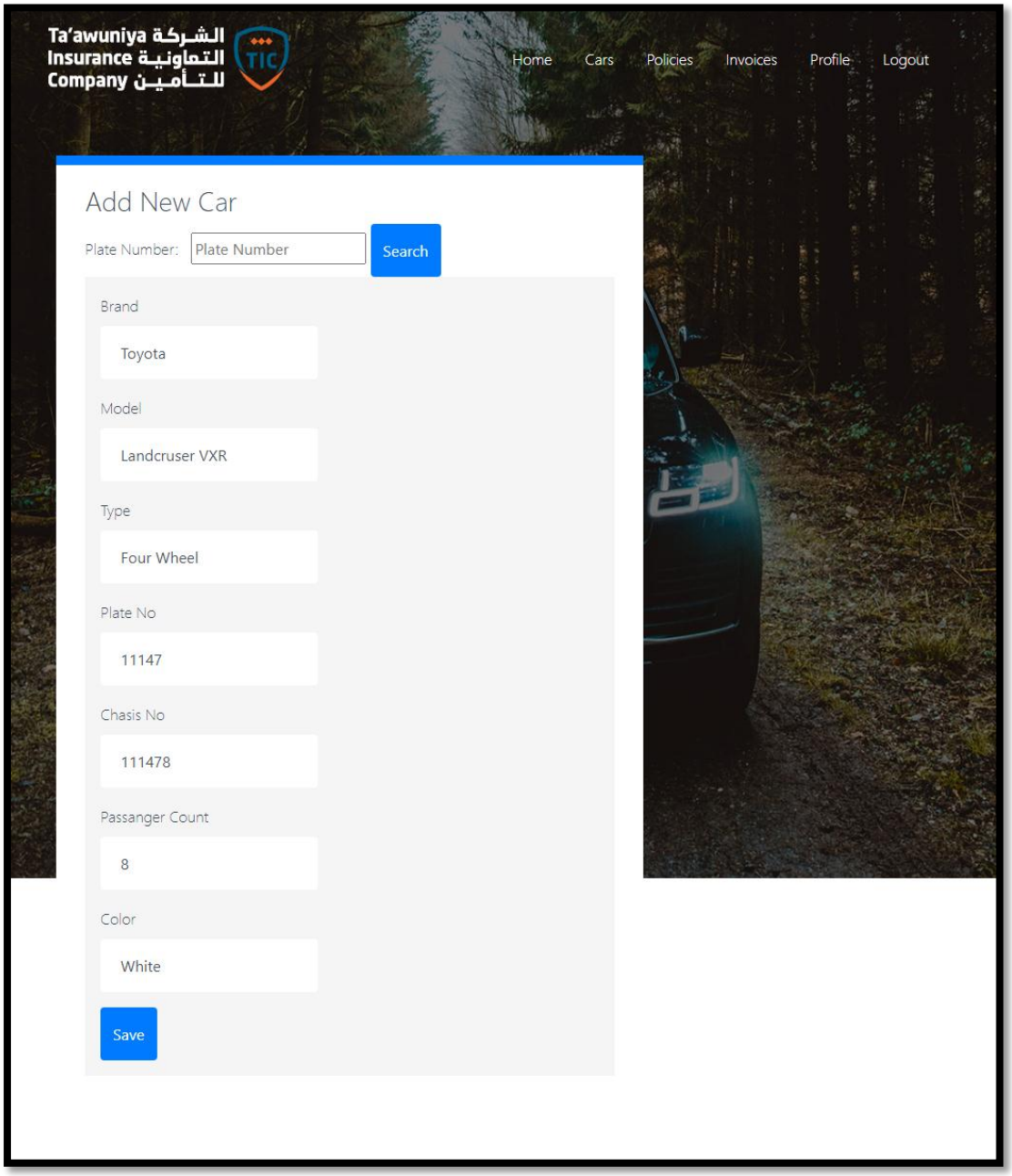


Figure 16: Search car result page

Figure (16) shows the last step of adding the client car to his cars list at the system, all car info will come from the traffic police servers, the client will just click save.

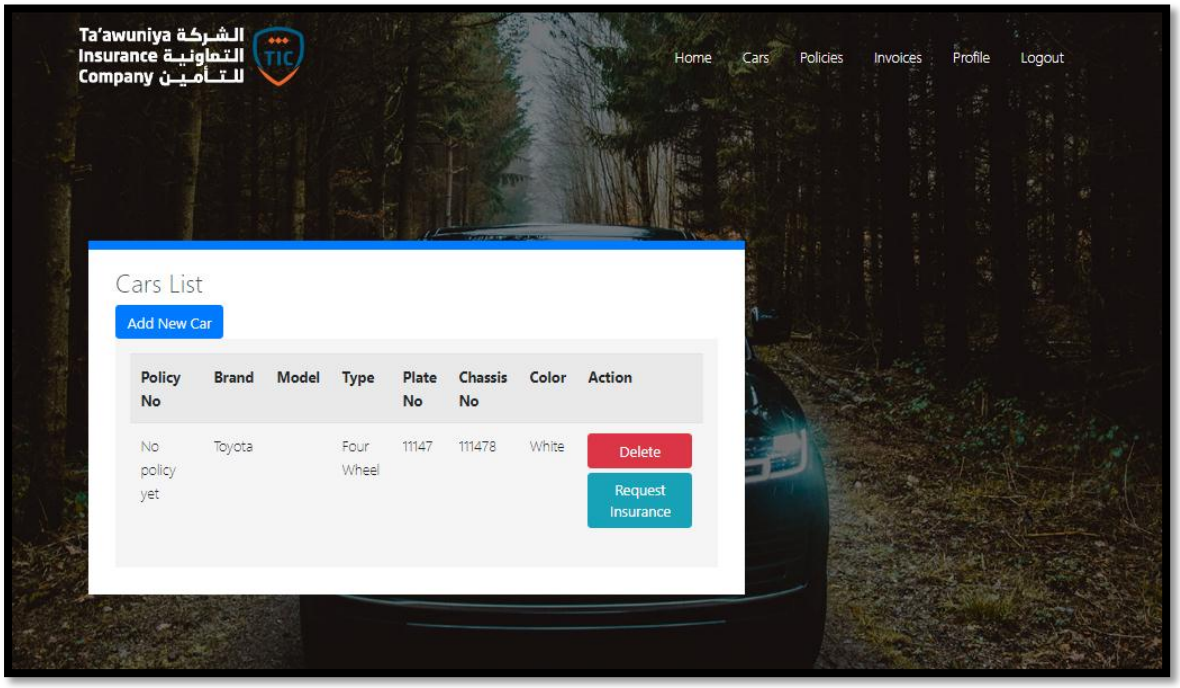


Figure 17: Client cars list page

Figure (17) shows client cars list, by this page the client can delete the car he listed before or can request new insurance policy or renew an old policy.

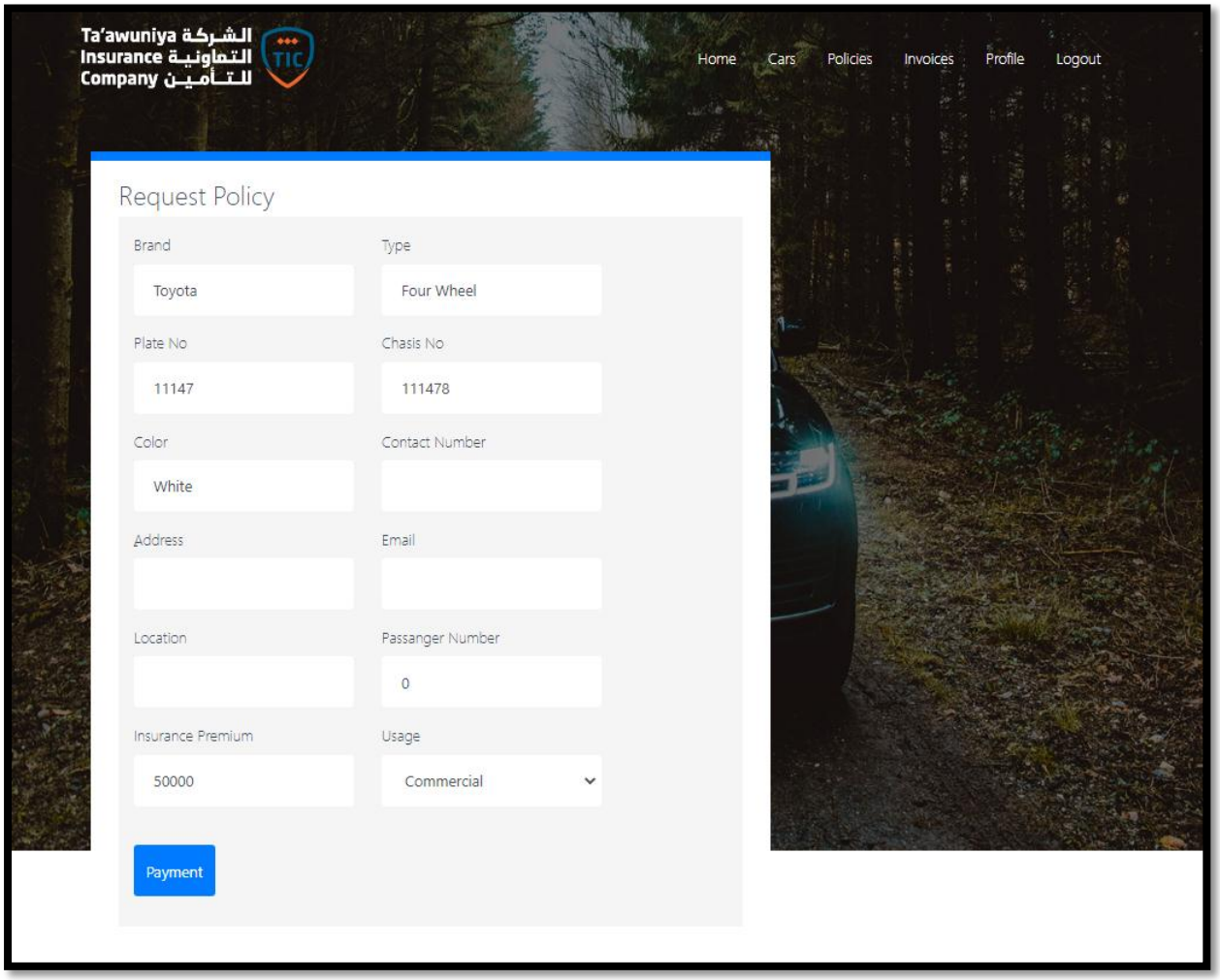


Figure 18: Request police page

Figure (18) shows the first step of requesting an insurance policy, the client will enter his contact phone number, address, email and the city location, then he will go to the second page which is the payment page.

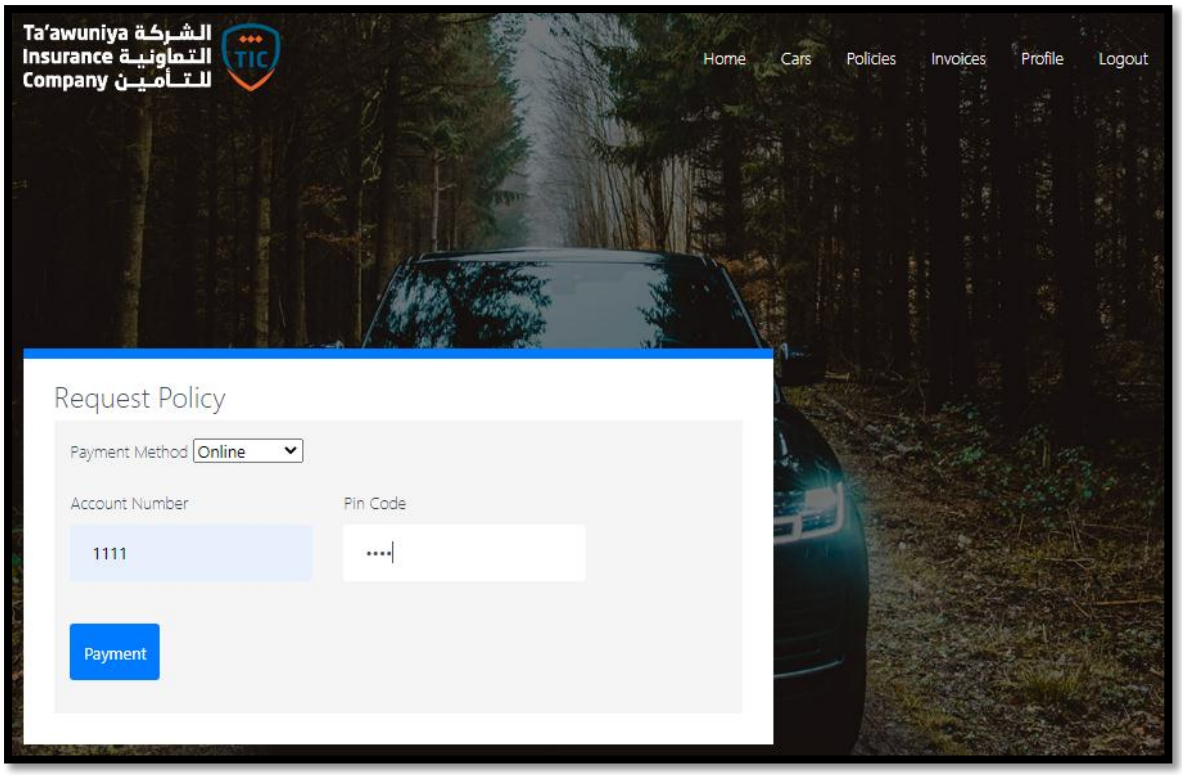


Figure 19: Payment info page

Figure (19) shows the payment page for the insurance policy request, the system has three types of payment, online payment, bank payment, smartcard payment. Online payment if payment via connecting the bank server directly, bank payment is using when the client pay the fees at the bank branch then he will just enter the notification number of the payment document, smartcard use cards to deduct the amount of the policy from the card balance.


Ta'awuniya Insurance Company

Invoice

Invoice No	12	فاتورة رقم
Policy No	23	وثيقة رقم
Type of cover	تأمين ضد الغير للسيارات	نوع التأمين
Insured Name	Salih Ahmed Khalid	المؤمن له
Address	- Phone:0912125547	العنوان
Date	2021-01-12	التاريخ

Insurance Vehicle Details — بيانات المركبة المؤمنة

Make Model	Type of Body	Chassis No	Plate No	Vehicle Usage
نوع وطراز الماكينة	شكل الهيكل	رقم الشاسي	رقم اللوحة	استعمال المركبة
Toyota - Landcruser VXR	Four Wheel	111478	11147	Commercial

Amount SDG		المبلغ بالجنيه
Insurance Premium	50000.00	قسط التأمين
Stamp Fee	105.20	رسوم دمغة
ICF Fee	7.36	إشراف ورقابة
Total Premium	50112.56	اجمالي الاشتراك

Figure 20: Invoice print page

Figure (20) shows policy invoice print page, it appear after the client complete the payment info, then he will be later allocate it from the invoices link at his account

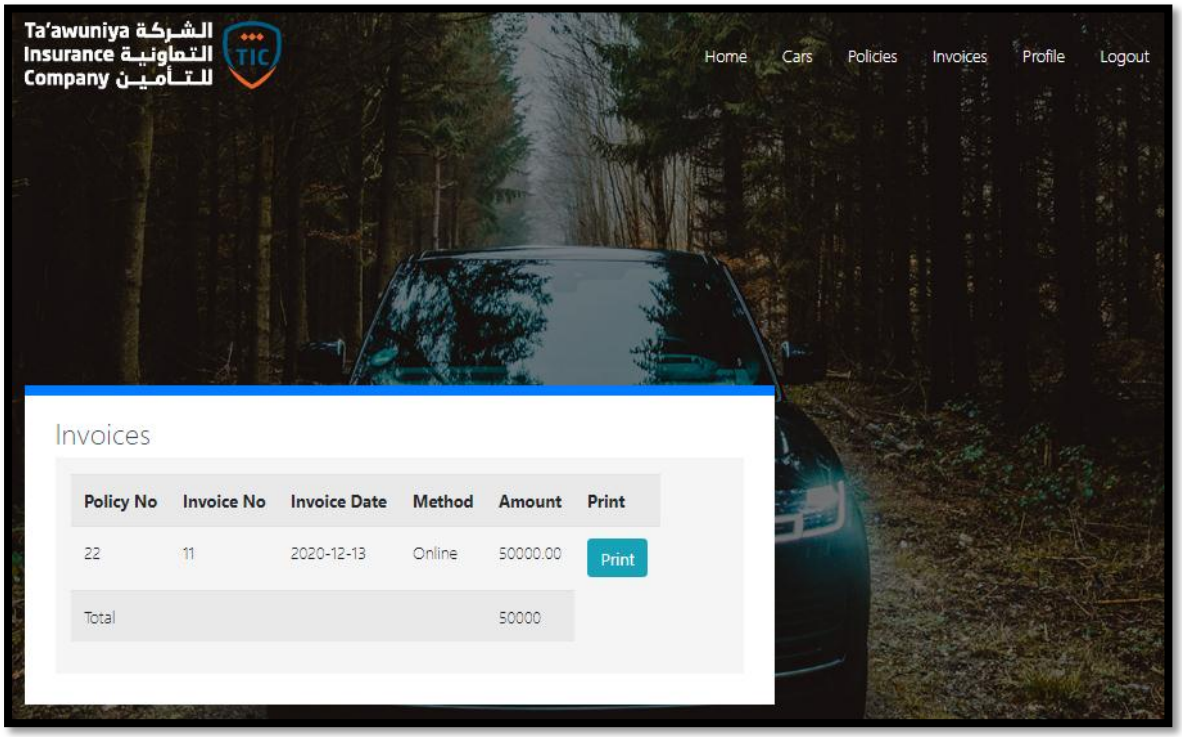


Figure 21: Invoices page

Figure (21) shows the client invoices list, it clarify the invoices list the client paid for each policy and the total amount that client paid to the company.

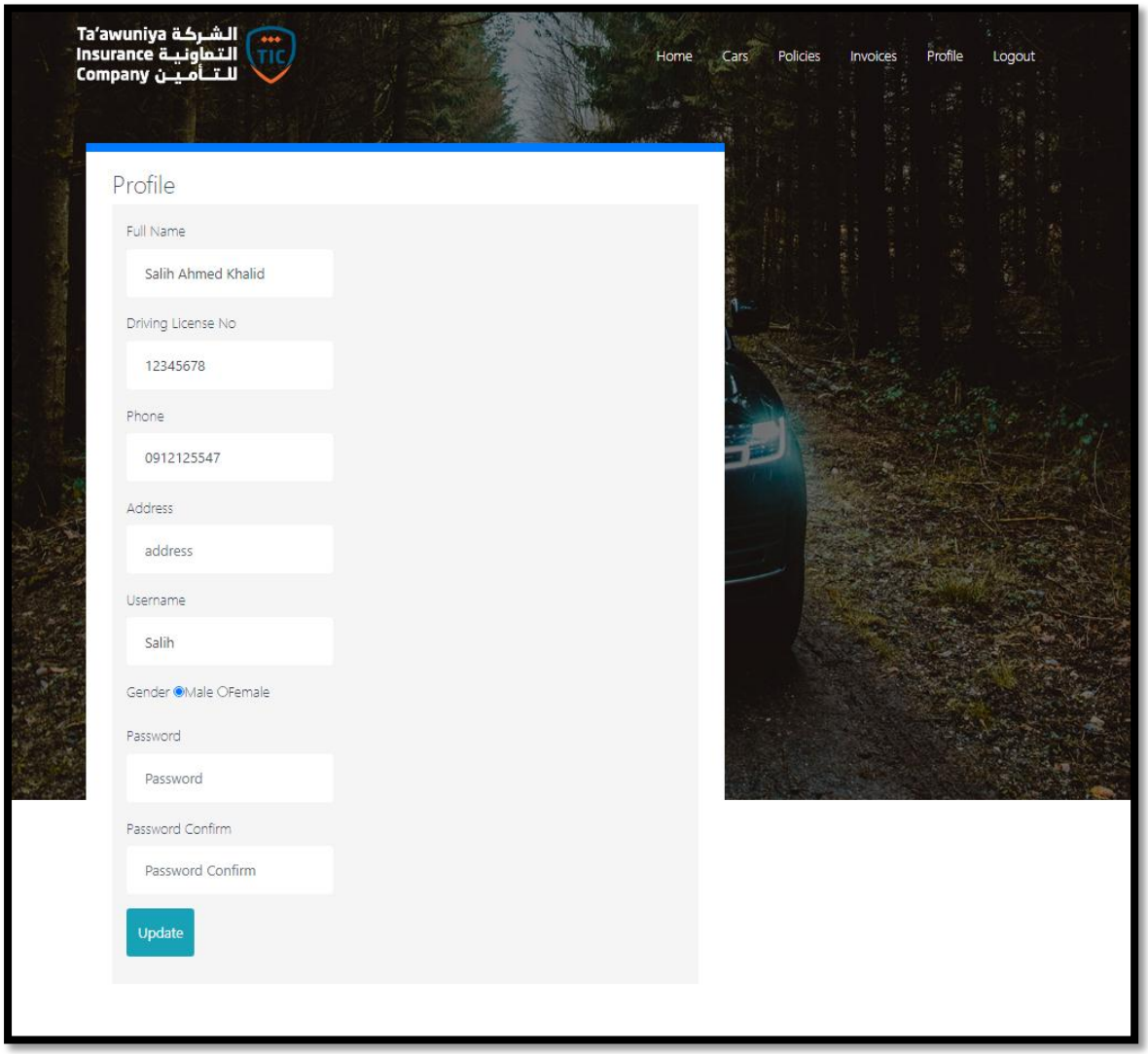


Figure 22: Client profile page

Figure (22) shows client profile update page, client will see all his old profile info except the password and then he will enter a new info if he want then press update.

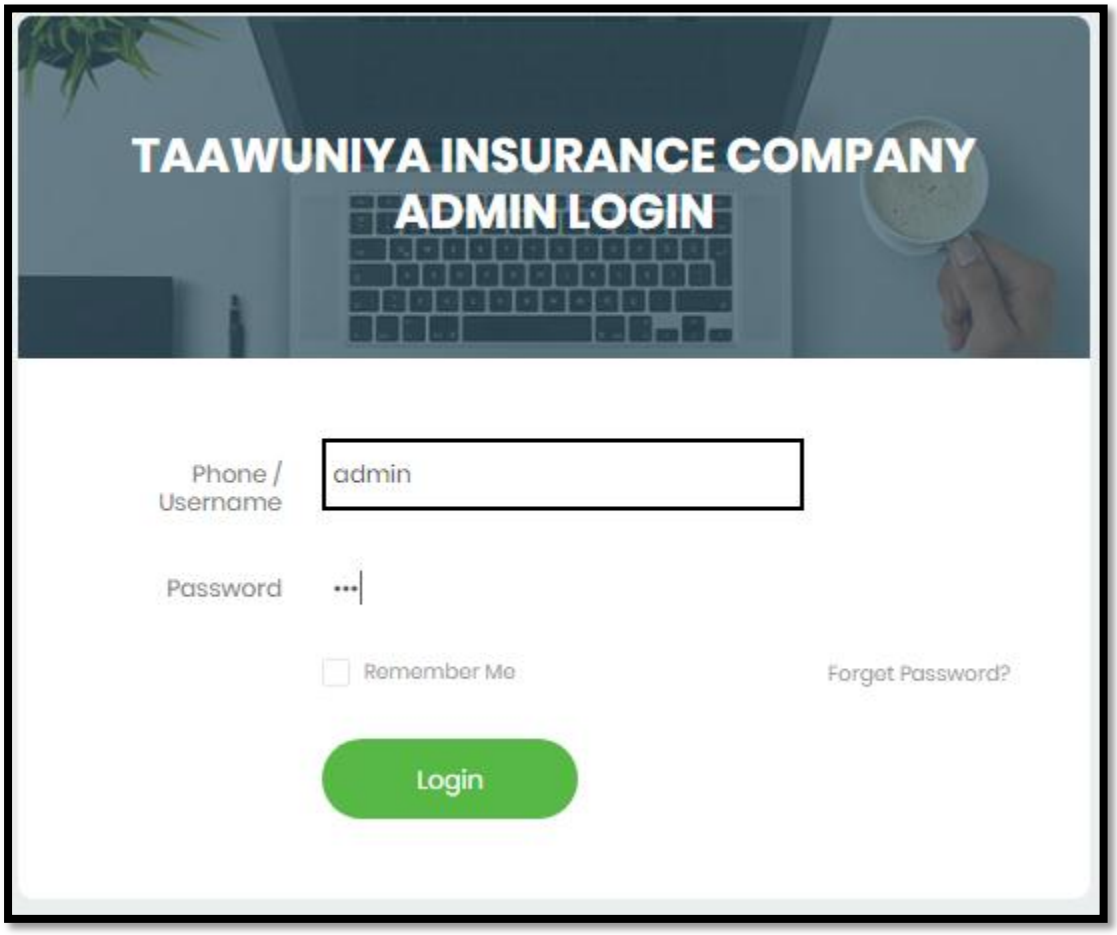


Figure 23: Admin login page

Figure (23) shows admin login page, admin is the company administration after the user logged in he will be able to do all control panel activities of the control panel.

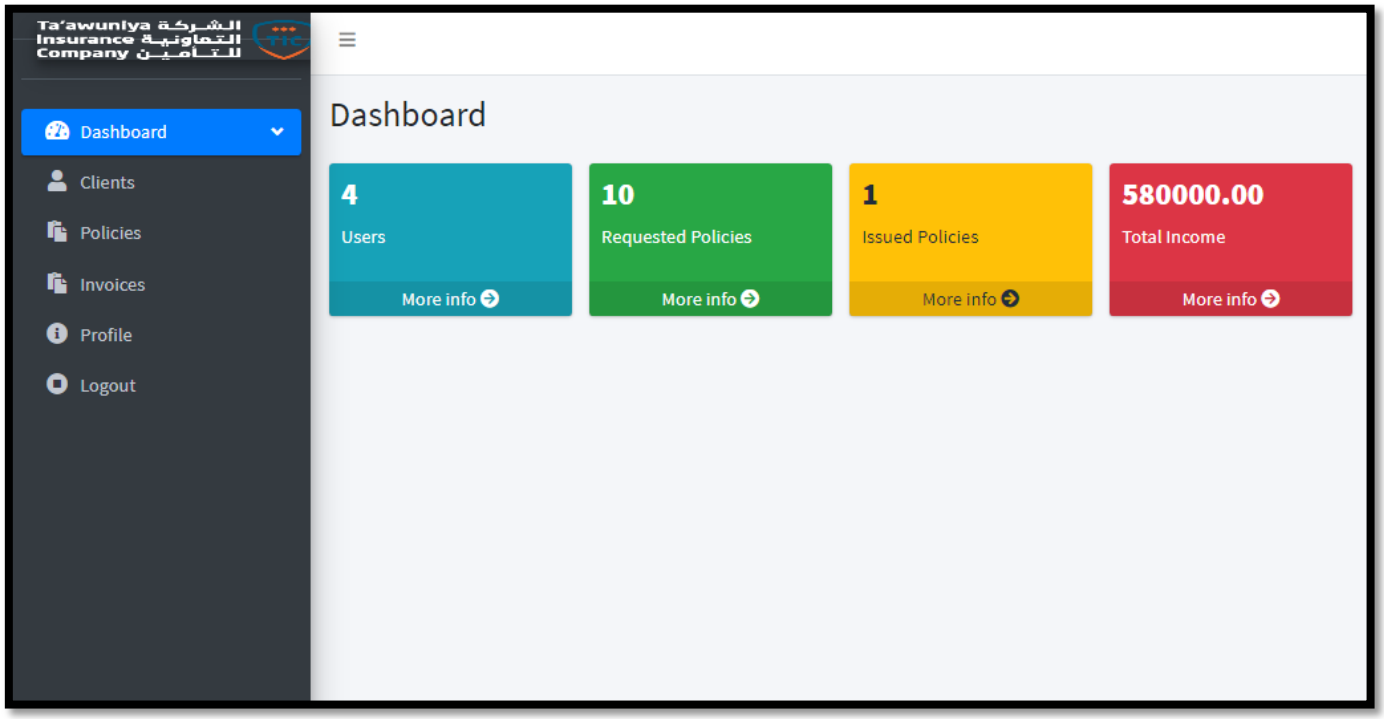


Figure 24: Admin main page

Figure (24) shows admin main page, it shows some statistics like users counter, number of requested policies, number of issued polices and the total income of the payments.

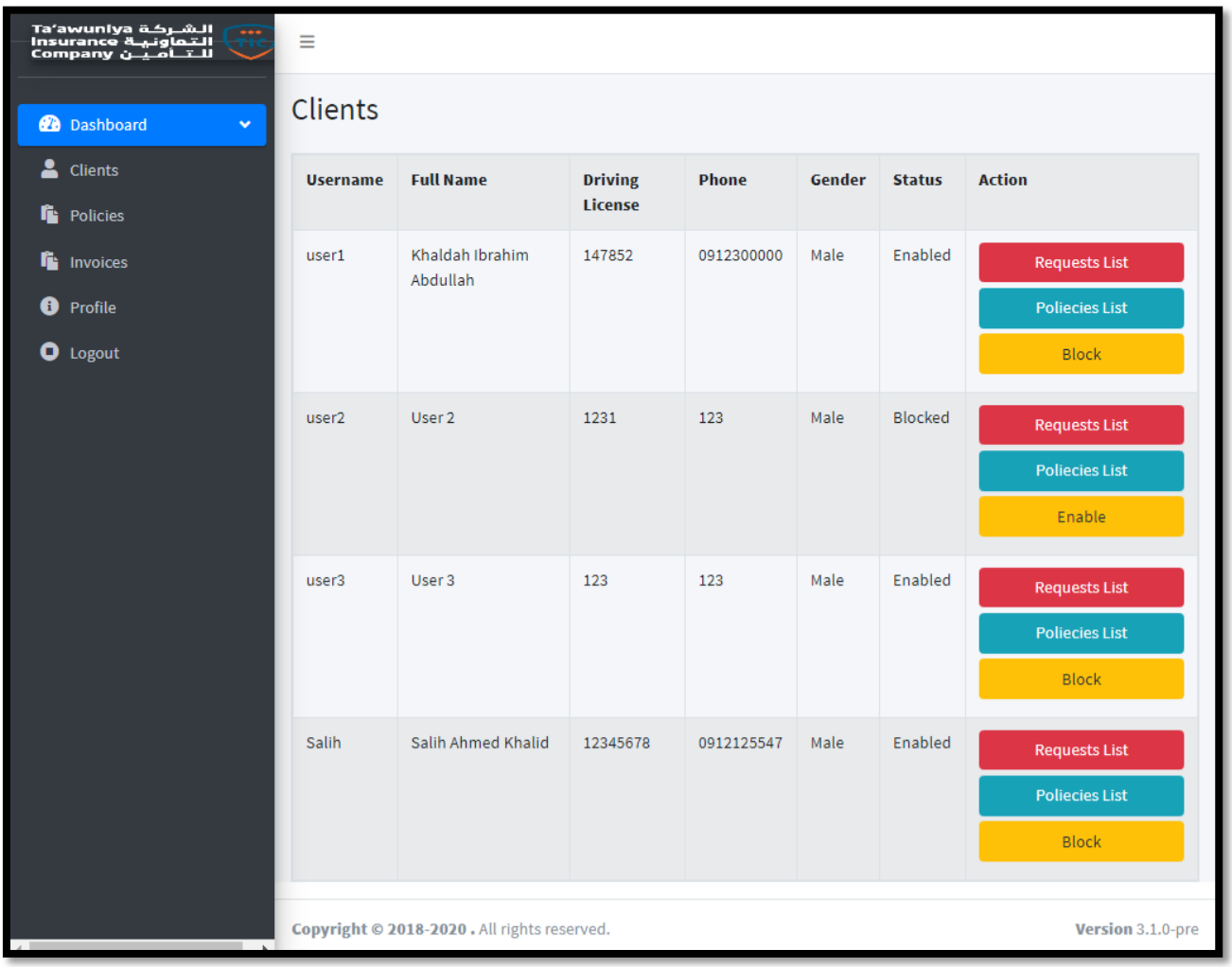


Figure 25: Admin clients page

Figure (25) shows admin clients list page, this will list all clients registered at the system, and can also show client requests list and the policies of the client and blocking client from logging to the system.

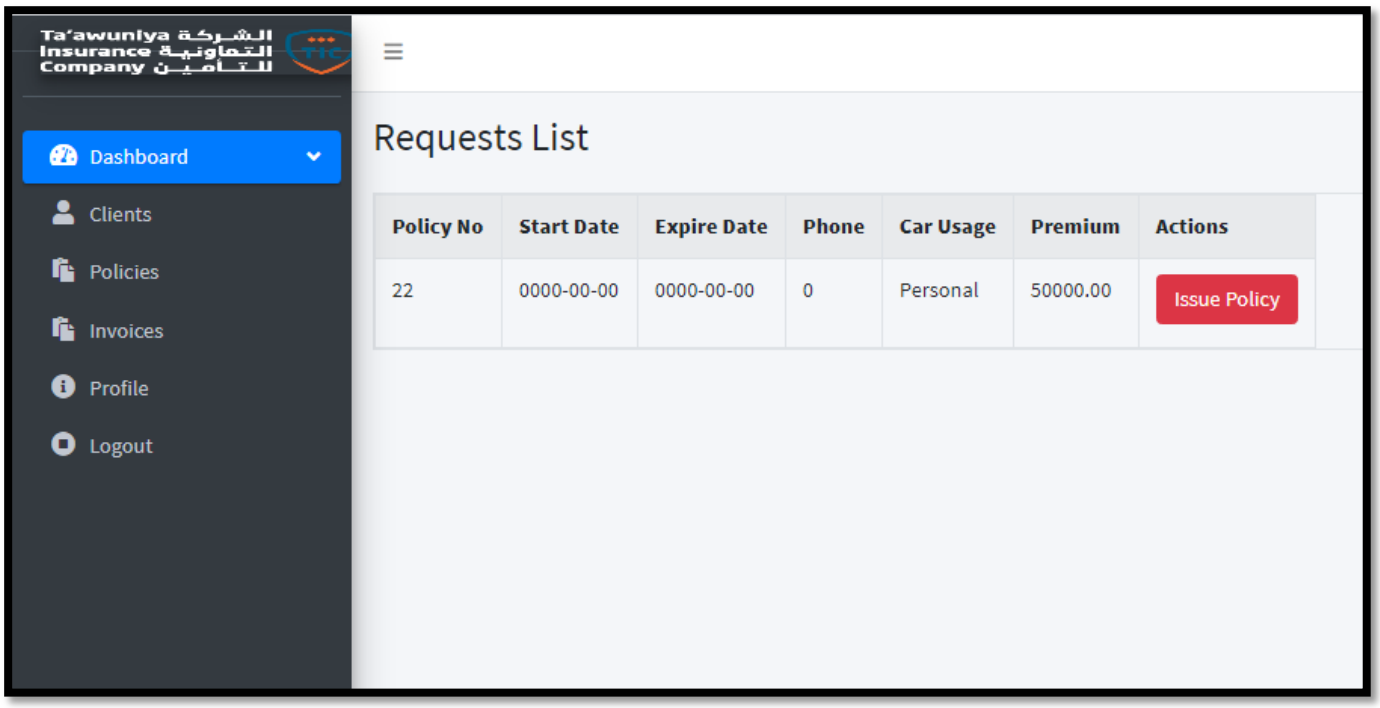


Figure 26: Admin client policy requests

Figure (26) shows client policy requests, the admin can enter this page by enter clients page and see client requests then he will enter this page and issue the policy from.

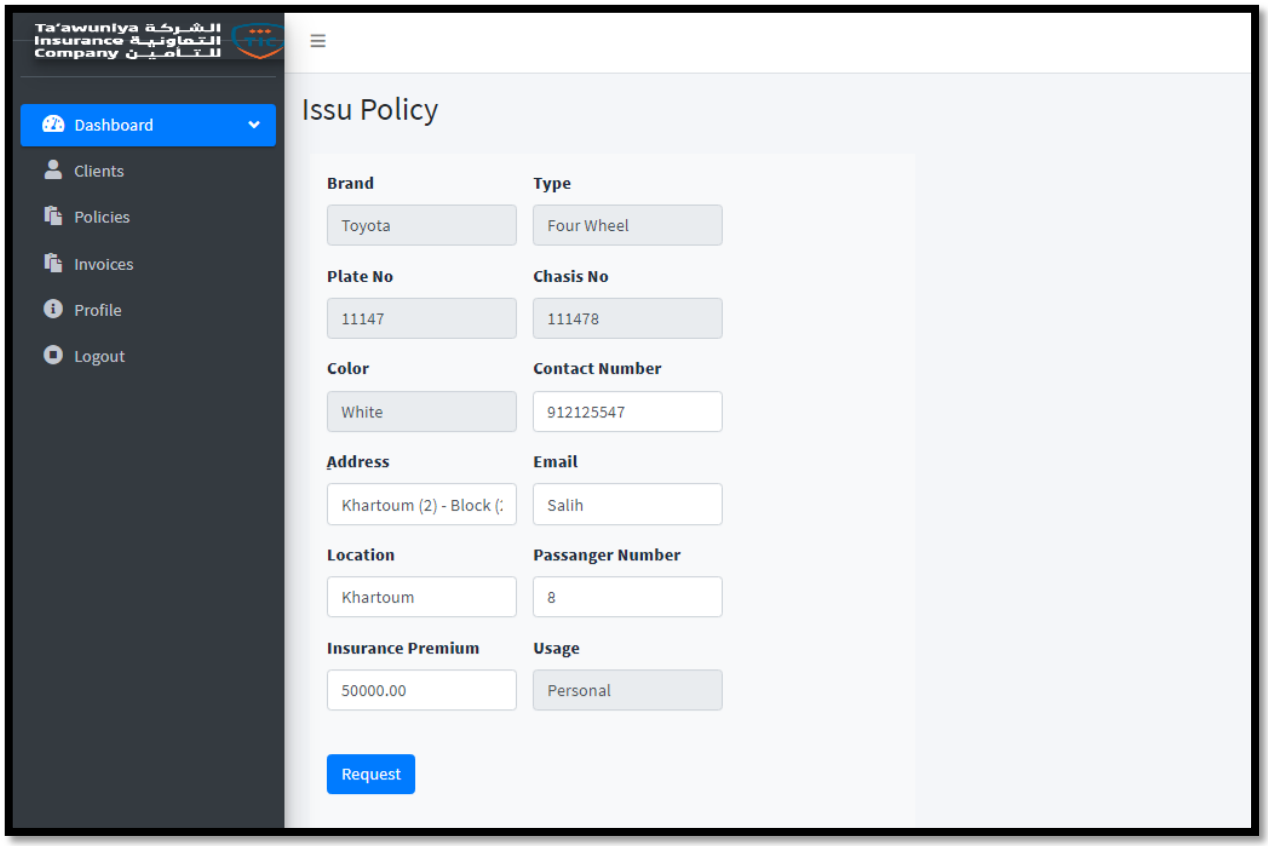
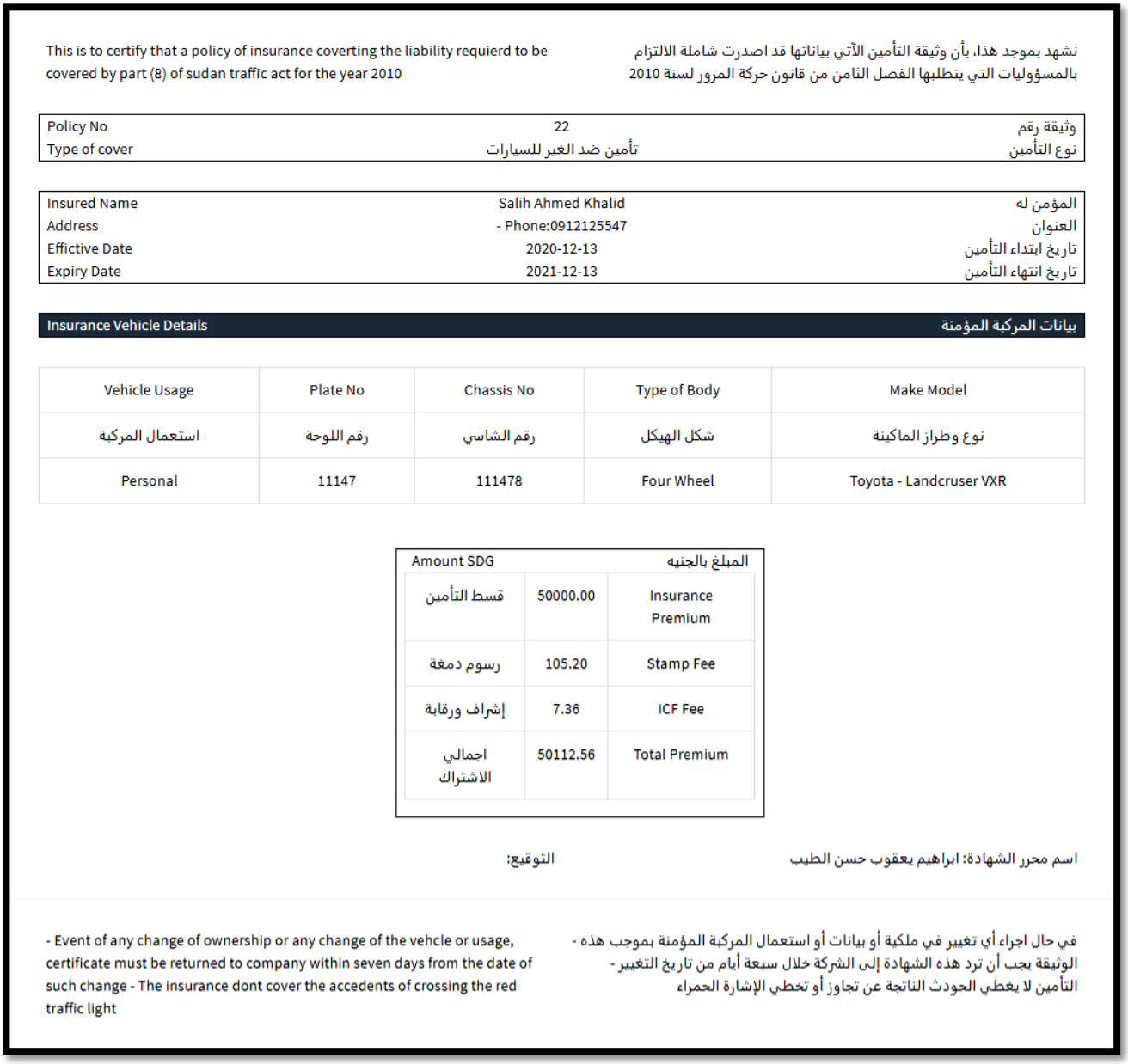


Figure 27: Admin policy issue page

Figure (27) shows policy issuing page, the main page of the project, admin just accept issuing the policy nothing to do more, because of all the process done already by the client and the police traffic server as adding the car any payment.



نشهد بموجد هذا، بأن وثيقة التأمين الآتي بياناتها قد اصدرت شاملة الالتزام بالمسؤوليات التي يتطلبها الفصل الثامن من قانون حركة المرور لسنة 2010

This is to certify that a policy of insurance coverting the liability requierd to be covered by part (8) of sudan traffic act for the year 2010

Policy No	22	وثيقة رقم
Type of cover	تأمين ضد الغير للسيارات	نوع التأمين

Insured Name	Salih Ahmed Khalid	المؤمن له
Address	- Phone:0912125547	العنوان
Effictive Date	2020-12-13	تاريخ ابتداء التأمين
Expiry Date	2021-12-13	تاريخ انتهاء التأمين

Insurance Vehicle Details — **بيانات المركبة المؤمنة**

Vehicle Usage	Plate No	Chassis No	Type of Body	Make Model
استعمال المركبة	رقم اللوحة	رقم الشاسي	شكل الهيكل	نوع وطراز الماكينة
Personal	11147	111478	Four Wheel	Toyota - Landcruser VXR

Amount SDG		المبلغ بالجنيه
قسط التأمين	50000.00	Insurance Premium
رسوم دمغة	105.20	Stamp Fee
إشراف ورقابة	7.36	ICF Fee
اجمالي الاشتراك	50112.56	Total Premium

اسم محرر الشهادة: ابراهيم يعقوب حسن الطيب

التوقيع:

- في حال اجراء أي تغيير في ملكية أو بيانات أو استعمال المركبة المؤمنة بموجب هذه الوثيقة يجب أن ترد هذه الشهادة إلى الشركة خلال سبعة أيام من تاريخ التغيير - التأمين لا يغطي الحوادث الناتجة عن تجاوز أو تخطي الإشارة الحمراء

- Event of any change of ownership or any change of the vehcle or usage, certificate must be returned to company within seven days from the date of such change - The insurance dont cover the accedents of crossing the red traffic light

Figure 28: Admin policy print page

Figure (28) shows policy print page, after admin accept issuing the policy this page will be directed to all of the info here come from the database and nothing to be edited here.

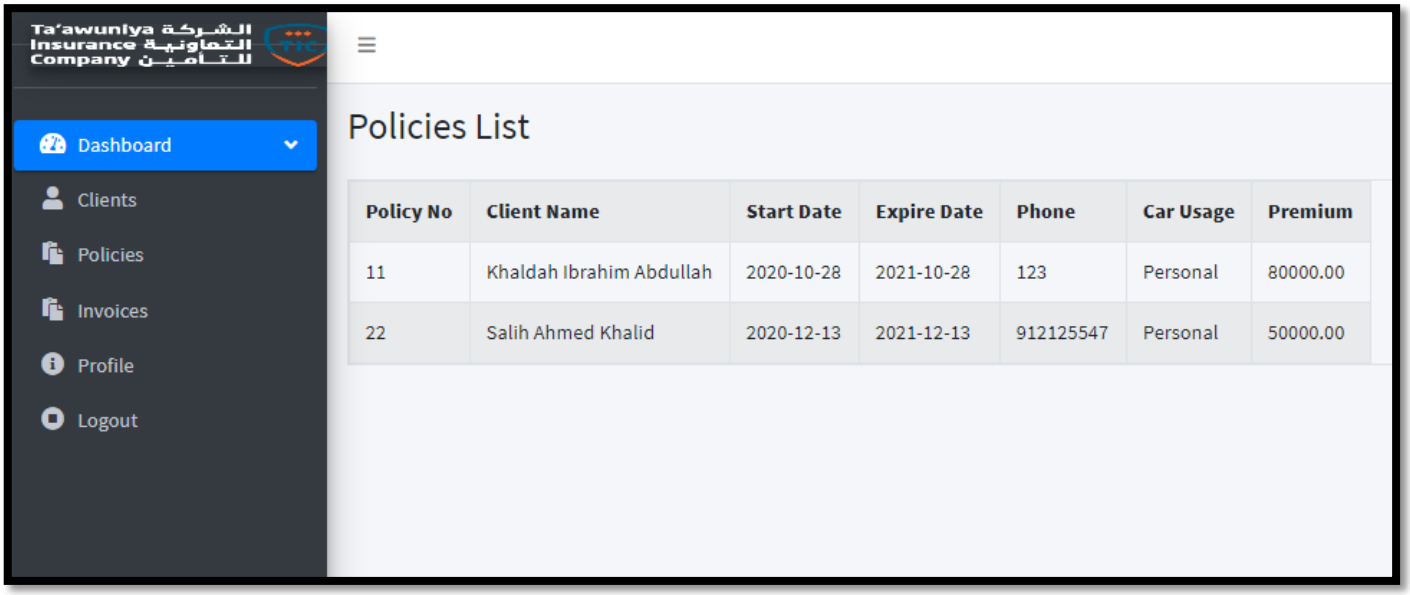


Figure 29: Admin issued policies requests

Figure (29) shows issued policies list, this is just a report page shows the policies issued by the company to it's clients.

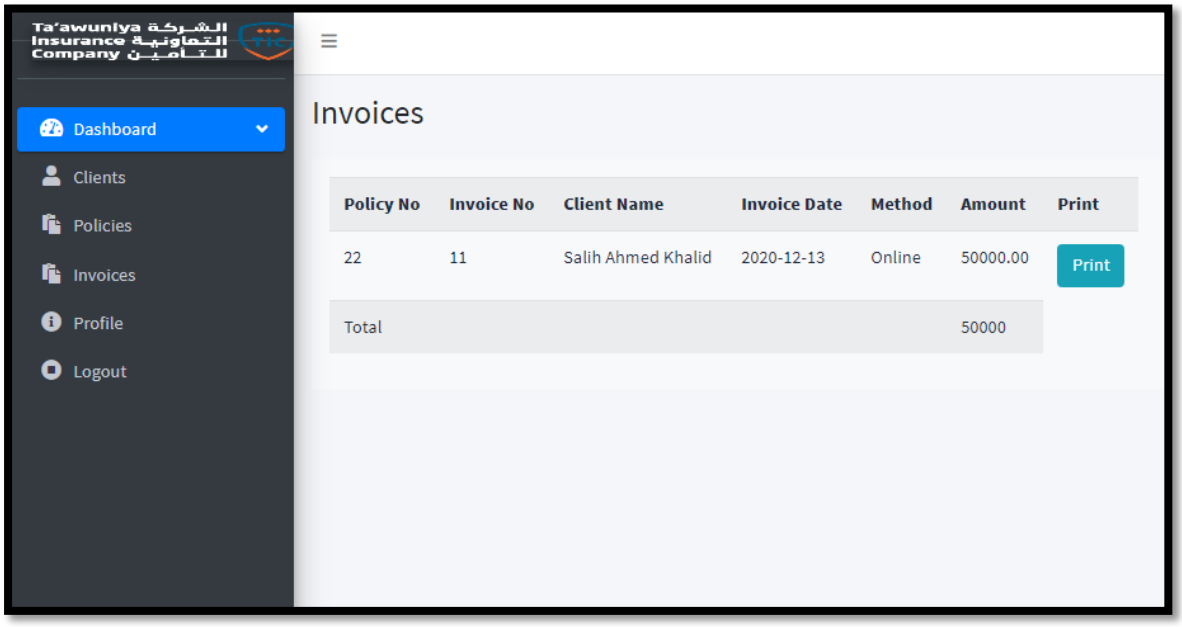


Figure 30: Admin invoices

Figure (30) shows invoices list, admin can find the invoices issued from the system to the clients and the total amount of invoices issued from the system.

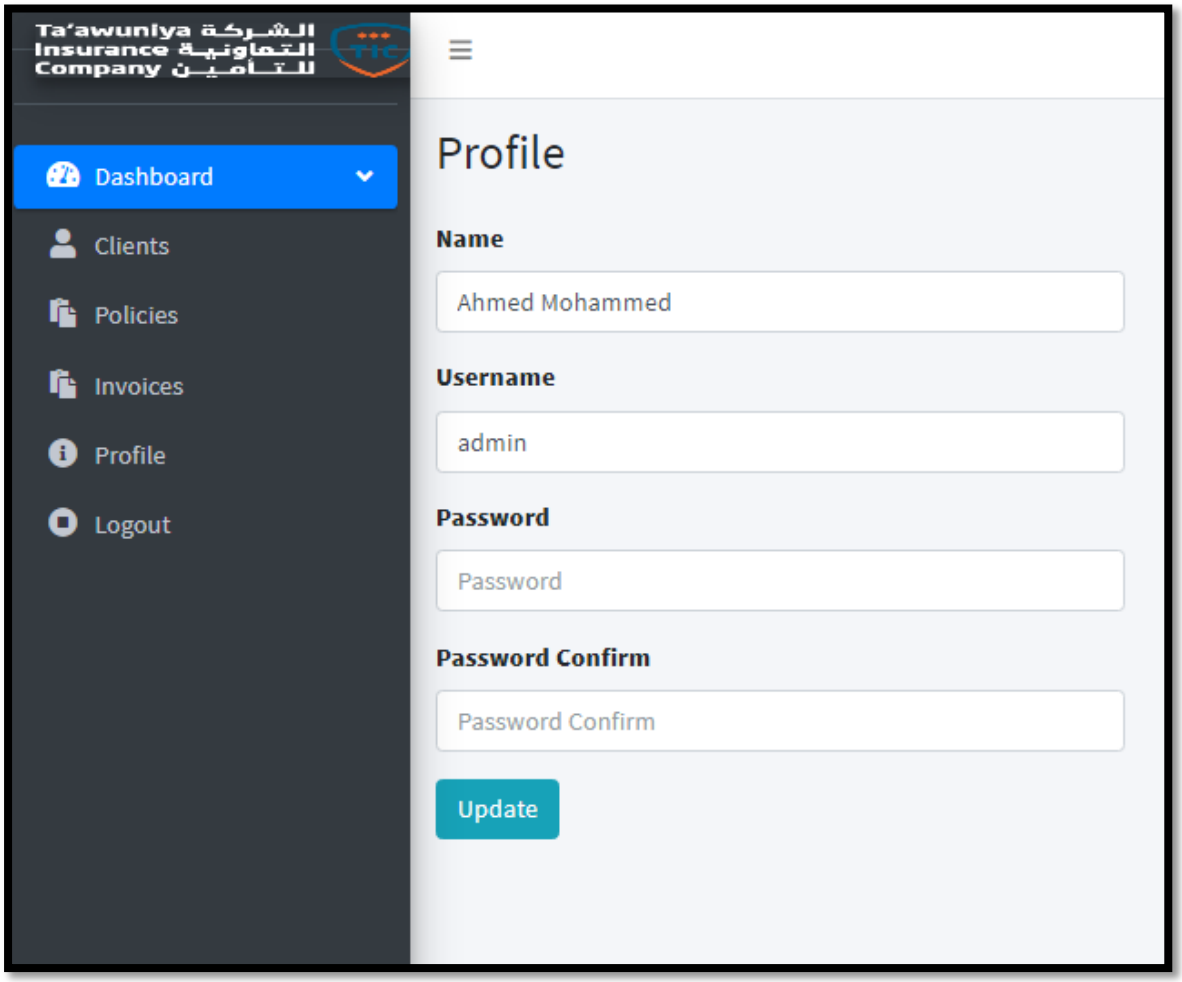


Figure 31: Admin profile requests

Figure (31) shows admin profile update page, admin will see all his old profile info except the password and then he will enter a new info if he want then press update.

4.6 Summary

Chapter included the introduction,definition of the system design, system implementation, purpose of System Implementation and findings that help to complete the insurance procedure and payment process.Findings contain clients' screens there include register page it shows registration form for company clients, login page it shows login page for clients, search car page it showsthe first step in adding the car to client cars list, search car result page it shows the last step of adding the client car to his cars list at the system, all car info will come from the traffic police servers, the client will just click save.

Also car list page shows client cars list, by this page the client can delete the car he listed before or can request new insurance policy or renew an old policy, request policy page it shows the first step of requesting an insurance policy, payment info page it shows the payment page for the insurance policy request, invoice print page it shows policy invoice print page, it appear after the client complete the payment info, then he will be later allocate it from the invoices link at his account and invoice page it shows the client invoices list, it clarify the invoices list the client paid for each policy and the total amount that client paid to the company.

System administrator screens used to control system, administrator can see all the clients details and reports. Administrator Screens are login page after the user logged in he will be able to do all control panel activities of the control panel, main page it shows some statistics like users counter, number of requested policies, number of issued polices and the total income of the payments.

Also administrator have clients page it shows admin clients list page, clients policy requests it shows clients policy requests, policy issue page it shows policy issuing page, the main page of the project, admin just

accept issuing the policy nothing to do more, because of all the process done already by the client and the police traffic server as adding the car any payment.

Also included policy print page after admin accept issuing the policy this page will be directed to all of the info here come from the database and nothing to be edited here, issued policies requests page it shows issued policies list, this is just a report page shows the policies issued by the company to its clients, invoices requests page it shows invoices list, admin can find the invoices issued from the system to the clients and the total amount of invoices issued from the system. Finally the admin profile requests page it shows admin profile update page, admin will see all his old profile info except the password and then he will enter a new info if he want then press update.

CHAPTER FIVE

Conclusion and Recommendations

CHAPTER FIVE

Conclusion and Recommendations

4.7 Conclusion

Electronic payment is usually defined as the automation of routine business procedures and operations and the transfer to virtual space. This process greatly increases business efficiency and simplifies everyday routine work. This study gives a wide knowledge of islamic insurance, cloud computing, electronic commerce, electronic payment systems and related work to them.

In addition in analysis stage data were collected at this stage through questionnaires, this stage aims to collect information about the old system and analyze it to description the current system, set a problem, to know the objectives of the proposed system and description it. Unified Modeling Language diagram used in this research with the purpose of visually representing a system along with its main actors, roles, actions, classes, in order to better understand about the system.

In design and implementation phase, electronic payment website was create based on Software as a Services structure (SaaS) and it screens helped customers to complete their procedures of insurance at any time without need to go to the company building ,they can registering on a website, paying fees and printing the policy of insurance. This paper also analyzed electronic payment systems from different security perspectives with the aim to provide a better customer understanding and satisfaction.

5.1 Recommendations

Recommendations to improve this project are:

- More expansion in electronic payment methods by add other insurance types procedure on the electronic commerce cloud.
- Create mobile electronic payment services applications based on electronic commerce cloud computing.

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Appendix

1. Description for system work

First client registration form for company client login page, the form contains: client name, driving license number, phone, address, username, gender and password, then the first step in adding the car to client cars list, first the client enter car plate number, then the system will search the car info at the traffic police servers this will end with the second step at adding client car data to the systemin search car page.Search car result pageall car information will come from the traffic police servers (server contained the details of cars), the client will just click save.

After saved car information client cars list pageappeared to the client can delete the car he listed before or can request new insurance policy or renew an old policy.Request police pagethe first step of requesting an insurance policy, the client will enter his contact phone number, address, email and the city location, then he will go to the second page which is the payment page. Payment page for the insurance policy request, the system has three types of payment, online payment, bank payment, smartcard payment. Online payment if payment via connecting the bank server directly, bank payment is using when the client pay the fees at the bank branch then he will just enter the notification number of the payment document, smartcard use cards to deduct the amount of the policy from the card balance.

Policy invoice print page, it appear after the client complete the payment info, then he will be later allocate it from the invoices link at his account. Admin issued all client requested by used admin clients list page. After policy issued client can shows the client invoices list, it clarify the invoices list the client paid for each policy and the total

amount that client paid to the company. Client will see all his old profile info except the password and then he will enter a new info if he want then press update.

Admin login page, admin is the company administration after the user logged in he will be able to do all control panel activities of the control panel.Admin main page, it shows some statistics like users counter, number of requested policies, number of issued polices and the total income of the payments.Admin clients list page, this will list all clients registered at the system, and can also show client requests list and the policies of the client and blocking client from logging to the system.

Client policy requests, the admin can enter this page by enter clients page and see client requests then he will enter this page and issue the policy from.Policy issuing page, the main page of the project, admin just accept issuing the policy nothing to do more, because of all the process done already by the client and the police traffic server as adding the car any payment. Policy print page, after admin accept issuing the policy this page will be directed to all of the info here come from the database and nothing to be edited here, issued policies list, this is just a report page shows the policies issued by the company to it’s clients.

Admin can find the invoices issued from the system by the invoices list page to the clients and the total amount of invoices issued from the system. Admin profile update page, admin will see all his old profile info except the password and then he will enter a new info if he want then press update.

2. Data dictionary

Data dictionaries are used to provide detailed information about the contents of a dataset or database, such as the names of measured variables, their data types or formats, and text descriptions. A data dictionary provides a concise guide to understanding and using the data. **(Purpose)**

Table 2: Data Dictionary

Colmn name	Column type	Length	Table	conistrans
notification_numb	Number	11	bank_payment	PK
Status	Text	10	bank_payment	
car_id	Number	11	Car	PK
user_id	Number	11	Car	FK
policy_numb	Number	5	Car	FK
car_brand	Text	50	Car	
car_type	Text	50	Car	
plate_numb	Text	10	Car	UNIQUE
chassis_numb	Text	10	Car	UNIQUE
Color	Text	50	Car	
passanger_numb	Number	11	Car	

Model	Text	30	Car	
emp_numb	Number	5	Employee	PK
emp_name	Text	50	Employee	
Username	Text	50	Employee	
Password	Text	50	Employee	
invoice_numb	Number	11	Invoices	PK
user_id	Number	11	Invoices	FK
inv_date	Date		Invoices	
policy_numb	Number	11	Invoices	FK
payment_method	Text	10	Invoices	
Amount	Number	18	Invoices	
account_numb	Number	11	Online	PK
pin_code	Number	11	Online	
Balance	Number	18	Online	
car_brand	Text	50	Policeserver	
Model	Text	20	Policeserver	
car_type	Enum	15	Policeserver	
plate_numb	Text	10	Policeserver	PK

chassis_numb	Text	10	Policeserver	UNIQUE
Color	Text	50	Policeserver	
passanger_numb	Number	11	Policeserver	
policy_numb	Number	10	Policy	PK
car_id	Number	11	Policy	FK
client_name	Text	50	Policy	
Gender	Number	1	Policy	
date_from	Date		Policy	
date_to	Date		Policy	
Addr	Text	100	Policy	
contact_number	Number	10	Policy	
Mail	Text	5	Policy	
Usage	Text	15	Policy	
Location	Text	15	Policy	
cost_type	Text	15	Policy	
passanger_numb	Number	18	Policy	
passenger_premium	Number	18	Policy	
insurance_premium	Number	18	Policy	

Status	Text	15	NO	
card_numb	Number	5	smart_card_payment	
Balance	Number	18	smart_card_payment	
type_id	Number	11	type_price	PK
type_name	Text	50	type_price	
Price	Number	18	type_price	
Id	Number	11	Users	PK
Username	Text	50	Users	UNIQUE
Password	Text	255	Users	
Fullname	Text	50	Users	
Gender	Text	6	Users	
driving_license	Text	15	Users	
Phone	Text	15	Users	
Address	Text	100	Users	
Status	Text	50	Users	

3. Comparison between electronic payment systems:

Table 3: Comparison between electronic payment systems (Awais Ahmed, 2019)

Features	Online credit card payment	Electronic Cash	Electronic Cheque	Smart Cards
Actual payment time transfer	Paid later, the store and bank check the status of credit card	Prepaid, Fee transfer. No need to leave the name of parties involved	Paid later, electronic checks or payment indication must be endorsed	Prepaid, both part make transfer
Online and offline transaction	Online	Online	Offline allowed	Smart card account
Bank A/C involvement	Credit card account	No involvement	Bank account	Smartcard account
Users	Any legitimate credit card users	Anyone	Anyone with the bank account	Anyone with bank or credit a/c
Party to which payment is made	Distributing banks	Store	Store	Store
Consumer transaction risk	Mostly born by distributing banks	The consumer at risk of stolen or misused	The consumer bears risk but can stop check	Consumers-risk of stolen, lost or misused
The current degree of popularity	Credit card org. checks for certification and total purchases.	Unable to meet internet standards in the areas of potential expansion	It cannot meet international standards so not so popular	Like online credit cards and is becoming more widely

	Thus, used internationally	&Inte		used
Anonymity	Partially or entirely	Entirely	No anonymity	Entirely, but if needed by the central processing agency can ask.
Small payments	Transaction costs high. So, not suitable	Low transaction cost. Suitable	It allows stores to accumulate debts until it reaches the limit before paying for it	Transaction costs are low. Like electronic cheque.
Database safeguarding	Safeguards regular credit card information	Large database & records S. No's of use etc. Cash	Safeguards regular account information	Safeguards regular account information
Transaction information face value	It can be signed & issued freely in compliance with the limit	Face value is often set & can't be altered.	It can be signed & issued freely in compliance with the limit	It can be deducted freely in compliance with the limt
Real/Virtual world	It can be partially used in the real world	An only virtual world	Limited to virtual but share checking a/c in the real world	It can be used in real or virtual
Limit on transaction	It depend upon credit card limit	It depends upon how much prepaid	No limit	It depend on how much money is saved
Mobility	Yes	No	No	Yes

Part of code

- **The code of payment method**

```
<div class="row" id="Online"><div class="form-group col-lg-6">
<span><label>Account Number</label></span>
<input name="txtaccount_numb" class="form-control">
</div><div class="form-group col-lg-6">
<span><label>Pin Code</label></span>
<input name="txtpin_code" type="password" class="form-control">
</div></div>
<div class="row" id="Bank" style="display:none">
<div class="form-group col-lg-12">
<span><label>Notification Number</label></span>
<input name="txtnotification_numb" class="form-control">
</div></div>
<div class="row" id="SmartCard" style="display:none">
<div class="form-group col-lg-12">
<span><label>Card Number</label></span>
<input name="txtcard_numb" class="form-control">
</div></div>
```