



**SUDAN UNIVERSITY OF SCIENCE
AND TECHNOLOGY**

**COLLEGE OF COMPUTER SCIENCE
AND INFORMATION TECHNOLOGY**

**E-COMMERCE PLATFORM IN
SUDAN**

**A THESIS SUBMITTED AS A PARTIAL REQUIREMENTS OF B.Sc. (HONOR)
DEGREE IN SOFTWARE ENGINEERING**

OCTOBER 2017

**SUDAN UNIVERSITY OF SCIENCE AND
TECHNOLOGY**

**COLLEGE OF COMPUTER SCIENCE AND
INFORMATION TECHNOLOGY**

SOFTWARE ENGINEERING DEPARTMENT

E-COMMERCE PLATFORM IN SUDAN

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Date:

19/10/2017

October 2017

الآية

قال تعالى:

(وَمَا تَوْفِيقِي إِلَّا بِاللَّهِ عَلَيْهِ تَوَكَّلْتُ وَإِلَيْهِ أُنِيبُ)

صدق الله العظيم
سورة هود الآية (88)

الحمد لله

الحمد لله حمد الشاكرين ، والحمد لله في كل وقت وحين.

الحمد لله حمداً على كل النعم.. والحمد لله على حمد النعم.. والحمد لله حمداً يليق برب النعم..

يا ربنا لك الحمد.

لك الحمد إذا أعطيت، ولك الحمد إذا أخذت.

لك الحمد حتى ترضى، ولك الحمد إذا رضيت، ولك الحمد بعد الرضى.

الاهداء

الى من كلله الله بالهيبه والوقار... الى من علمني العطاء بدون انتظار... الى من احمل اسمه بكل افتخار... ارجو من الله ان يمد في عمرك لتري ثماراً قد حان قطافها بعد طول انتظار .. ستبقي كلماتك نجوماً اهتدي بها اليوم وفي الغد و الى الابد

والذي العزيز

الى ملاكي في الحياة ..الى معني الحب والى معني الحنان والتفاني ...الى بسمه الحياة وسر الوجود...الى من كان دعاؤها سر نجاحي وحنانها بلسم جراحي الى اغلي الأحبة

امي الحبيبه

الى سندي وقوتي وملادي .. الى من اثروني على انفسهم .. الى من علموني علم الحياة ..

الى من اظهرو لي ما هو اجمل من الحياة

اخوتي احبائي

شكر و عرفان

نخص بأسمى عبارات الشكر والتقدير من قدم لنا العون ومد لنا يد المساعدة، وتفضل بالإشراف على هذا البحث، حيث قدم النصح والأرشاد وزودنا بالمعلومات اللازمة لإتمام هذا البحث.

المهندس: أحمد الرشيد

كما لا يسعنا إلا ان نشكر من كان لنا عوناً في رحلة بحثنا، وزرع التفاؤل في دربنا ولولا وجوده ودعمه الدائم لنا لما احسسنا بمتعة العمل وحلاوة البحث. كلمات الثناء لا توفيك حقك، شكراً لك على عطائك.

المهندس: ايمن ادم داؤود

المستخلص

اصبحت التجارة الالكترونية ضرورة اقتصادية و اسلوب حياة في بيئة التجارة والاعمال العالمية والعربية، وتشهد الدول العربية نمواً على صعيد التجارة الألكترونية وذلك بعد التقدم الهائل في شتى مجالات الحياة التكنولوجية و ظهور ما يسمى بتكنولوجيا المعلومات والتي بدورها ساعدت في انتشار التجارة الالكترونية، حيث ساعدت التجارة الألكترونية الأفراد في شراء ما يحتاجون اليه من سلع وخدمات من بيوتهم دون تحمل اي نوع من انواع التكاليف. هنالك العديد من الانظمة القائمة بأمر التجاره الالكترونيه ،ومن اشهر هذه الانظمة نظام اودو حيث يحتوي أودو على عدة وحدات ومن بينها وحدة خاصة بالتجارة ألكترونية ذات ربط متكامل مع الوحدات الضرورية للتجاره مثل وحدة المشتريات ،وحدة المبيعات ،وحدة المخازن ووحدة الحسابات حيث تقدم حلاً متكامل لعملية الشراء الالكتروني.

و بالرغم من وجود وحدة التجارة الألكترونية المتكاملة في أودو الا انها تعاني بعض القصور عند استخدامها في السودان وذلك بسبب أن عملية الدفع لاتتم حتى النهاية لأن بوابات الدفع المتاحة فيها لايمكن استخدامها في السودان في الوقت الراهن بسبب بعض المعوقات السياسية. لهذا يهدف هذا المشروع لأنشاء منصة لتمكين عملية الشراء ابتداءا من اختيار المنتجات وازادتها لسلة المشتريات وحتى عملية الدفع وذلك بأضافة واجهة دفع جديدة يتم ربطها ببوابة الدفع في السودان والتي تتمثل في المحول القومي لبنك السودان. المنصة تحاول مساعدة الأشخاص الذين يريدون القيام بعملية شراء عن طريق الانترنت، وذلك بتوفير العديد من المنتجات من مختلف الشركات التجارية حتى يتمكنوا من المفاضلة بينها وأختيار الأنسب لحوجتهم بالسعر المناسب لهم دون اي عناء او زيادة تكاليف. وكذلك تسعى المنصة لمساعدة التجار على عرض منتجاتهم بالأضافة الى أن المنصة تقوم بمساعدة تجارها على تنظيم عملهم من حيث ادارة المخزون، المشتريات، المبيعات بالأضافة الى إدارة الحسابات.وايضا تحاول المنصة مساعدة التجار بمنحهم تقارير عن المبيعات التي تبين احتياجات الزبائن.

Abstract

E-commerce has become an economic necessity and a way of life in the global and Arab trading and business environment. The Arab countries are experiencing growth in e-commerce following the tremendous progress in various fields of technological life and the emergence of the so-called information technology, which in turn helped the spread of electronic commerce. Individuals purchase the goods and services they need from their homes without bearing any kind of costs.

There are many systems based on e-commerce, and one of the most common of these systems is Odoo, where it has several units, including an e-commerce module with integrated connectivity with the necessary trading units such as the procurement unit, the sales unit, the warehouse unit and the accounts unit, offering a full solution for the electronic procurement process.

Perhaps of the existence of the integrated e-commerce unit in odoo, it suffers some shortcomings when used in Sudan because the payment process is not completed until the end because the payment gates available in it cannot be used in Sudan at present due to some political obstacles. This project aims to establish a platform to enable the purchase process from selecting products and adding them to the shopping basket and even the payment process, in addition to a new payment interface linked to the payment gateway in Sudan, which is the National Switch of Sudan.

The platform tries to help people who want to make a purchase through the Internet 'by providing many products from different companies so that they can compare between them and choose the most suitable for their needs at the suitable price for them without any trouble or increase in costs. The platform also helps merchants to display their products. The platform also helps traders in organizing their work in terms of inventory management, purchasing, sales and account management. The platform also helps merchants to provide them with sales reports that reflect customer needs.

Important Terms:

Terms	Shortcuts
BACS	Bankers Automated Clearing Services
EBS	Electronic Banking Services
PNG	Portal Network Graphics(extension of image)
CPG	Consumer Packaged Goods
PAN	Personal Account Number
IPIN	International Personal Identification Number

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CHAPTER ONE
INTRODUCTION

1.1 Introduction

The term "Electronic commerce" (or e-Commerce) is referred to the buying and selling of goods and services over an electronic network, primarily the internet. These business transactions occur either as business-to-business, business-to-consumer, consumer-to-consumer or consumer-to-business.

The world has recently witnessed an increasing interest in e-commerce, which is an inevitable result of recent developments in ICT.

Many countries seek to maximize the role of e-commerce. It is expected that the growing role of e-commerce in the near future due to the impact of this trade on the markets and companies performance and competitiveness, where is expected to be E-commerce is style of trade that will be prevailing between organizations and individuals during this century in all parts of the world .

In the growing countries especially in Sudan, there is slowing in growth in the field of e-commerce and this refers to the illiteracy in the reads and writes, the ignorance of using and dealing with the computer and also the barrier of language because most of the e-commerce transaction that is accomplished is using the English language.

To grow up e-commerce in Sudan we need to enhance all aspects of e-commerce. The main factor that fulfills the growth of e-commerce is to handle e-payment. In another hand the organize of the vendor business can influence on e-commerce also, help a customer who wants to make shopping by facilitating the process of search throughout the website and give the vendor information about customer need are achieve this growth.

This chapter introduces the current research with the problem statement described first, after that, the proposed solution, objective, scope, and importance of the study is described respectively.

1.2 Problem Statement

- The work within the commercial institutions needs to manage. (Controlling the input, output and account for the employees and management of human resources). Therefore, the foundation needs a software team to develop a system for managing the organization, which needs cost and time.
- Most of the electronic payments in Sudan are for the benefit of a specific service and it is for services rather than tangible products, such as the purchase of electricity, booking flight and booking of hotels.

- Most websites that available to customers are showing products or services from one commercial institution.
- Most of the Traders don't have the possibility of collecting information about the customer's need.

“How should E-commerce payment in Sudan handled, resolved and requirement variation managed?”

1.3 Propose Solution

- We proposed using an ERP software system (Odoo) to providing business solutions for traders to organize work within the business enterprise.
- Grant electronic payment for various products and services by building an interface to integrate with the payment provider.
- Provide a website for a customer that gather products and service from different commercial institutions (optimize search in the website).
- Create a report for the vendors that help them to collect information about the customer's need.

1.4 Objective

- Performing the process of online payment.
- Providing ERP solution for the vendor (inventory integrated with the sale, accounting, and purchase module).
- Facilitating purchase process for customer.
- Providing vendor information about customers needs.

1.5 Scope

- Standard ODOO 9 with customization on e-commerce module.
- Integration ODOO 9 e-commerce with the payment provider.

- Standard ODOO 9 with customization on sale module to create sale report.

1.6 Importance

- Multiple options: where the buyer finds him self in front of more than the form and brand of the same commodity that he wants at varying prices, which enables him to trade.
- Increase competition between commercial companies.
- The market balance has reached a fair minimum.
- Do not waste time searching for the desired product and the buyer can pass through more than one gallery in a few moments.
- Most important thing the process of online payment done.

1.7 Structure

This research is divided into six chapters.

1. Chapter One:

This chapter presenting the problem statement, proposed solution, important of the study, objectives of the study and scope of the study.

2. Chapter Two:

This chapter contain describing of another e-commerce platform, snapshot about the ERP software system and payment provider.

3. Chapter Three:

This chapter describes the methodology used in research, tools and techniques that used during analysis and implementation.

4. Chapter Four:

This chapter describes the analysis of the system.

5. Chapter Five:

This chapter describes the implementation of the platform.

6. Chapter Six:

This chapter debates Conclusion and Recommendations.

1.8 Conclusion

By the end of this work we developed a system that conducts the electronic commerce process in all its stages of displaying all the products and services with each other and demand by the customers and payment. It also provides an administrative system for traders to organize work within the establishment.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter describes the preliminary concepts of payment and presents a current platform for E-commerce. The chapter begins with the definition of study related to the payment process. Next, it presents an example of an e-commerce platform that we take benefit from its study, then it describes ERP system. At the end of it, it shows deference between e-commerce platforms.

2.2 Study related to payment process

2.2.1 Typical Payment Process

Account Information Store: during checkout, the e-Commerce platform sends a credit card number to the CPG to gets the token back code and the e-commerce platforms usually do not store credit card numbers or other sensitive information. E-commerce uses e-Tokens to represent payment account numbers instead of storing the actual number. Subsequent transactions use this token instead of sensitive account numbers. If you use the same credit card in multiple transactions, it will be represented by the same token. This use of the same token supports fraud detection and reporting.[10]

2.2.2 Payment information

The consumer starts providing payment information by choosing the type of payment required and then begins filling out their credit card details or logging into the bank online for direct money transfer. Depending on payment options, payment on delivery may also be available, the payment information is collected by the e-commerce engine, then encrypted and sent to the payment gateway or bank, or directly inserted into the form provided by the portal and processed outside the e-commerce engine. After the payment is accepted the order in charge of it sends a confirmation back to the e-commerce engine.

2.2.3 Three common payment models

There are some of the global payment models:

1. Digital cash: it entails the use of a digital wallet (a plug-in to web browsers) where invoice or receipt of payment is kept and cash is withdrawn. It does not require personal or contact details of the buyer.
2. Credit card: is a card whose holder has been granted a revolving credit line.
3. Other payment methods
 - Debit card: enables the holder to access funds in a deposit account at an authorized deposit-taking institution.
 - Micropayment: is a term used for amounts as low as one cent and allows vendors to sell content, information and services over the internet at very low unit prices.
 - Money orders: are similar to certified checks, the transaction cost is small and the advantage is that it can be sent to the named receiver [12].

2.3 Literature studies

2.3.1 ERP implementation for an administrative agency as a corporate frontend and an e-commerce smartphone app

Is to build a web interface using an ERP system where all customers can verify all the constituent information about their company, display products /portfolio services and contract new products (e-commerce). It is also planned to develop hybrid mobile applications for Android and iOS customers to manage and verify their features and data on the navigation. [2]

The benefit we get from this study is where we can do customization in odoo, which module can affect.

This study focuses on managing company's business and our study focuses on payment process and in another hand we organized company business (inventory, sale and purchase).

2.3.2 Shopify

Shopify is a software as a service (SaaS) e-commerce platform built to meet the needs of a typical store owner. It offers hosting, shopping cart, payment processing, order management, product catalogues, blogs, and much more. The shop owner can subscribe to the Shopify, choose a design, create a product catalogue, set up a payment portal, and make a sale on the same day without any programming or expertise. Shopify gives you the ability to completely modify HTML, PNG, and

JavaScript from the interface theme. Designers are able to add features such as visual effects, responsive designs, bundled products, charging capabilities, and social plug-ins that can bring all that is expected of a modern e-commerce site. [4]

2.3.3 Woo Commerce

Woo Commerce is built to integrate seamlessly with Word Press, which is the world's most popular and powerful method for creating a website and also built on the top of the Woo Themes brand.

Woo Commerce can accept both online and offline payments, it comes bundled with PayPal (for accepting credit card and PayPal account payments), Bank Transfer (BACS), and cash on delivery for accepting payments, cheque payments and also you can install another payment method.[5]

2.3.4 3Dcart

3Dcart's complete the all-in-one platform includes everything that the customer needs to sell online This suite of powerful tools will enable the customer to design his store, manage inventory, track sales and more, all from within your site's dashboard. 3Dcart supports as many as 200 payment gateways and methods. Its benefits are the drag and drop editor, which is not exactly the best on the market, but it, helps you click and drag components instead of having to modify CSS or HTML code.[9]

2.3.5 Magento

Magento is a full-source open source e-commerce platform aimed at web designers, developers and business owners who are looking for a complete e-commerce website solution. Open Source Magento architecture enables the user to maintain full control over the structure and functionality of a website [8].

2.3.6 Squarespace

This software tool allows companies to build professional websites directly from their content. With Squarespace, files, images, and text can be placed directly in Squarespace platform, the software will structure and publish a professional website that a Individuals or companies can fully manage from the web. All this happens with no User skills required [6][7].

2.3.7 Nettailer

The Nettailer platform simplifies the entire process in a retail business model.

By providing distributor integration, the retailer only needs to sign deals with distributors who want to work with to get access to all the products you want to offer to market, usually between 100,000 and 300,000 products, without their own development integration and systems. By providing online shop and integration for CNET1, the world's largest supplier of product data, the retailer has only to select which products to display in the online store [11].

2.4.8 Alsoug.com

One of the common e-commerce websites in Sudan, it shows different products from different persons who want to sale his own stuff and products, and it provides sellers contacts to communicate with them.

The website also shows the advertisements for different companies for jobs vacancies, the services that provided by these companies, advertise for the lost properties and other advertisements. Beside the website, they also have a mobile application[13].

Here are the differences between the aforementioned studies:

Platform	Characteristic
ERP implementation for an administrative agency as a corporative frontend and an e-commerce smartphone App	Just manage vendor business by mobile app.
Shopify	Offers hosting, payment processing, order management, product catalogues and enable the customer to choose a design.
Woo Commerce	Accepts both online and on delivery payment.
3Dcart	Platform support for as many as 200 payment gateways and enable customer to modify CSS or HTML in website design,
Magento	Open source platform focus on e-commerce website enables designer and programmer to fully control the structure and functionality of the website.
Squarespace	Software tool allows individuals companies to build professional websites directly from their content.
Nettailer	The platform simplifies the entire process in a retail business model.
Alsoug.com	A website that provides person or company advertises area to show their products and services and just allow contact to communicate with customer and sellers.

Table 2.1: Differences between studies

2.4 Odoo

To achieve our goal we proposed to use odoo9. Odoo systems are software used by companies to coordinate their business.

Odoo supports the efficient operation of business processes by integrating tasks related to sales, purchasing, accounting, warehouse management, website, manufacturing, e-commerce .

Figure 2.1 shown odoo modules



Figure 2.1: Odoo Modules

2.4.1 The reasons why Odoo is the proper one for the projects

1. It is an open source product: There is no budget available for this project.
2. Odoo has more modules such as e-commerce that has full integration with the sale, purchase, accounting, inventor and website module, these modules meet my project needs.
3. Versatility: considering the open source products, it is the solution that has more modules. Developer can extend the project and add new modules and adapt old one in the future.
4. Support: Odoo has the broadest worldwide support. And it has partners all over the world.
5. Easiness: it is a product with a very simple architecture.
6. High flexibility : it can be customized to suit customers business requirements and needed changes.
7. Has a concept of multi-company that achieve our solution (providing ERP solution to the vendor).

2.4.2 Benchmarking: Odoo system solution in details

The Odoo solutions considered are analyzed :

Odoo open source	
Website	https://www.odoo.com
Modules and features	<ul style="list-style-type: none"> <input type="checkbox"/> Customer relation management (CRM) <input type="checkbox"/> Project management <input type="checkbox"/> Storage management <input type="checkbox"/> Accounting and finance management <input type="checkbox"/> Shopping management <input type="checkbox"/> Sales management <input type="checkbox"/> Human resources <input type="checkbox"/> Marketing <input type="checkbox"/> Manufacturing <input type="checkbox"/> Point of sale <input type="checkbox"/> Knowledge management
Supported database Operating System	PostgreSQL Linux and Windows
Programming language	Python
Architecture	MVC (model ,view ,control)
Access	To access to Odoo9 only have to use the website with the server IP address where is the web-client.
Small and medium-sized business and Enterprise organizations	Both

Table 2.2: Odoo System

2.5 Payment Provider

A payment provider is a mediator that provides a specific way to pay. It facilitates the transfer of information between a payment portal (such as a website, mobile phone) and the front end processor or acquiring a bank.

Bank of Sudan represents the payment provider in Sudan (EBS). It contains a national switch that collecting all banks.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents adopted methodology in achieving this research. Research procedures, operational framework and Tool and technique.

3.2 Research Design and Procedure

Related method and techniques are needed to collect and this started with literature studying. The collection narrowed down after a period of searching for general knowledge from references and academic papers. Later identifying the problems they have. The goal of the research is building an e-commerce platform to provide ERP solution for vendors, online payment and facilitating the shopping operation for customers.

3.2.1 Problem Identification

The world has recently witnessed an increasing interest in e-commerce, as inevitable result of recent developments in ICT. For this reason, we need to grow up the volume of e-commerce in Sudan, which is limited to the purchase of a particular goods or service, also the purchase process is not completed until the payment process.

3.2.2 Validation

We will validate and test our proposed platform by :

1. When the vendor completes the registration process, a user is created by his name and company related to him that checked by an administrator.
2. The vendor can check his company and can update the information that related only to his company.
3. After the end of the purchase process, vendor can check the influence in other modules like inventory, accounting, and others. And also check that the process of payment is completed successfully by checking if the money is transferred from customer's account to vendor's account.

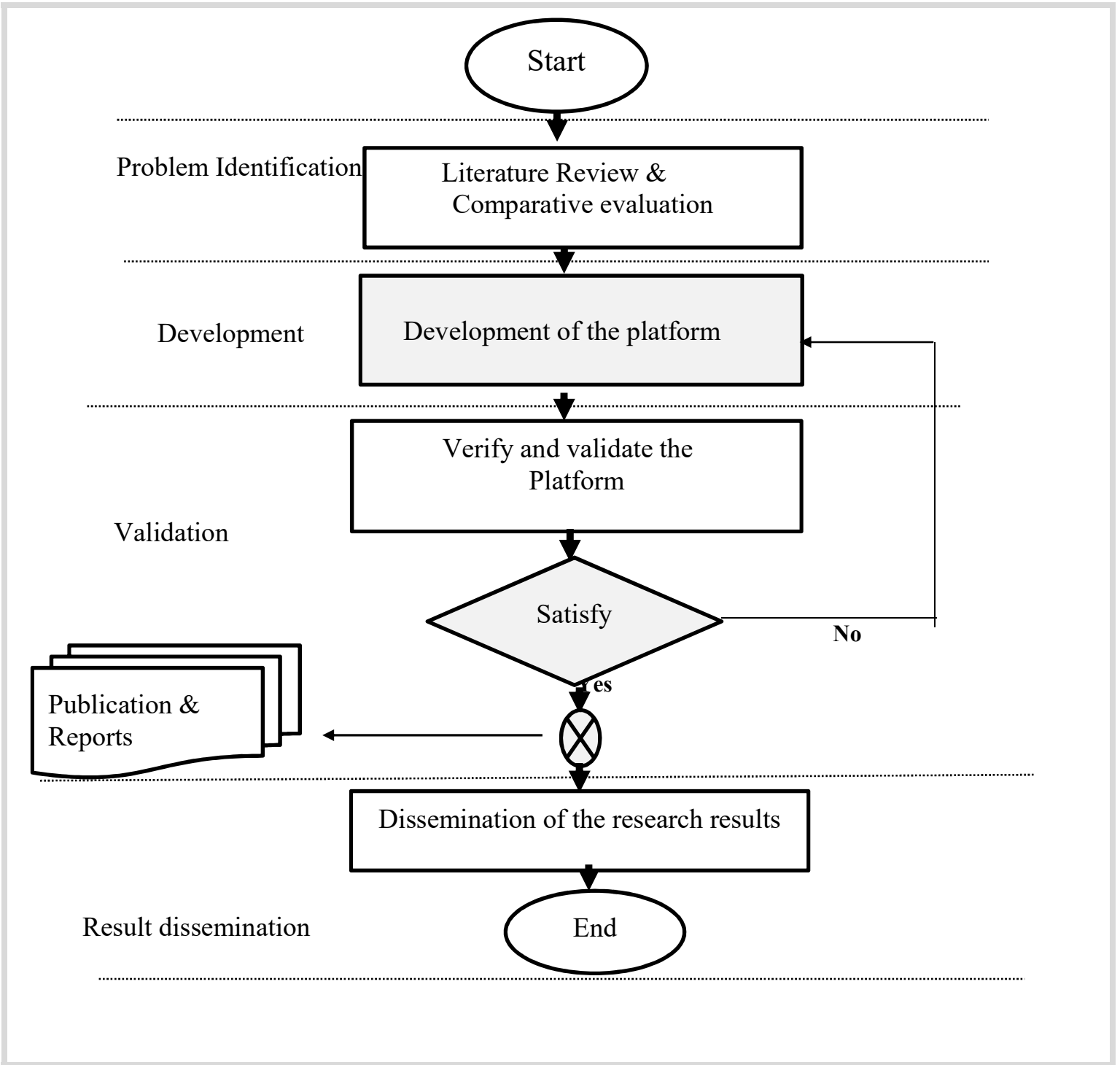


Figure 3.1: Research Methodology

3.2.3 Development of the platform

The Following flowchart shows the steps for developing the proposed work

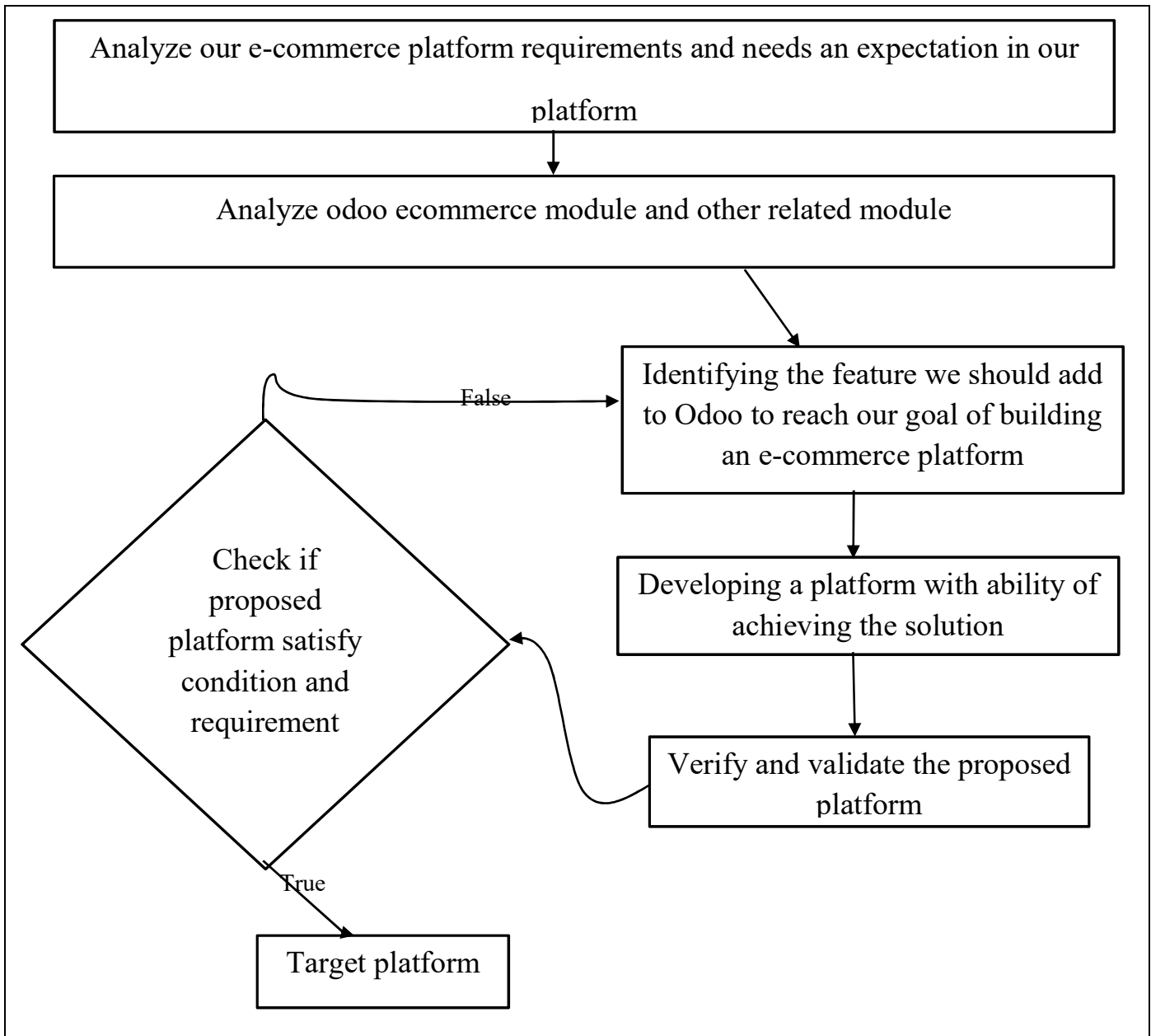


Figure 3.2: Flow Chart for developing

3.3 Operational Framework

The Operational Framework for the Proposed Work

NO	Research Question	Objective	Activity(s)	Deliverable(s)
1.	Why are we building our platform?	To support electronic payment in Sudan and facilitate the processes of purchasing for customers. To help vendors to manage their works.	Literature Study	Result of the study. Analysis on the result.
2.	What the main factor for building e-commerce platform in Sudan	To develop an interface to integrate with payment provider	Literature Study. Comparison analysis	integration with payment provider
3.	What is the proposed solution and how it can be applied?	Using ERP system to provide a business solution for traders. Develop an online payment provider to handle the process of payment.	Building platform	The proposed Platform.

Table 3.1: Operational Framework

3.4 Tool and Techniques

To develop the proposed platform we need to use the following tools and technique:

- a) ERP System
- b) Apache Tomcat Server
- c) Java programming language(JDK 1.7)
- d) MySQL database
- e) Restful web service
- f) Unified Modeling Language(UML)

CHAPTER FOUR
ANALYSIS AND DESIGN

4.1 Introduction

The analysis phase is where the project life cycle begins, also it is the part of the project where you identify the overall direction that the project will take through the creation of the project strategy documents. Gathering requirements is the main task of this phase. The design phase is an important phase in the project lifecycle, it shows the overall picture of the system's requirements and operation's hierarchy.

4.2 Requirements

4.2.1 Functional Requirements

- Creating a new customer with additional information like PAN and IPIN.
- The system creates a new user with a new company when the administrator validates vendor's information.
- Sending authentication message to vendors when complete registration.
- Each vendor could audit his company (accounting, inventory, sales, and purchase), and he has a full control over it.
- Payment process.
- Reconciliation process
- Showing vendor registration report.
- Showing sales for a specific period as a report.
- Optimizing search for the product on the website (search by product price).

4.2.2 Non-Functional Requirements

- Availability:
 - Each vendor could have company to shows his products.
 - Each customer offers all products from all companies and can display the products of a particular company.

- **Security:**
 - Every vendor has the potential to see and modify the contents of his company only.
 - Administrator oversees all vendors and could see all companies.

- **Reliability:**
 - Vendor's information must be trustworthy
 - The process of payment must be very reliable.

- **Performance:**

The process of payment must be done in few seconds.

- **Usability:**

Users should have no trouble in using the platform with maximum ease of use as possible.

4.3 System Models

This section represents proposed system analysis including use case diagram, sequence diagram, and activity diagram.

4.3.1 Use Case Diagram

The Following diagram describes the main functionality of our system:

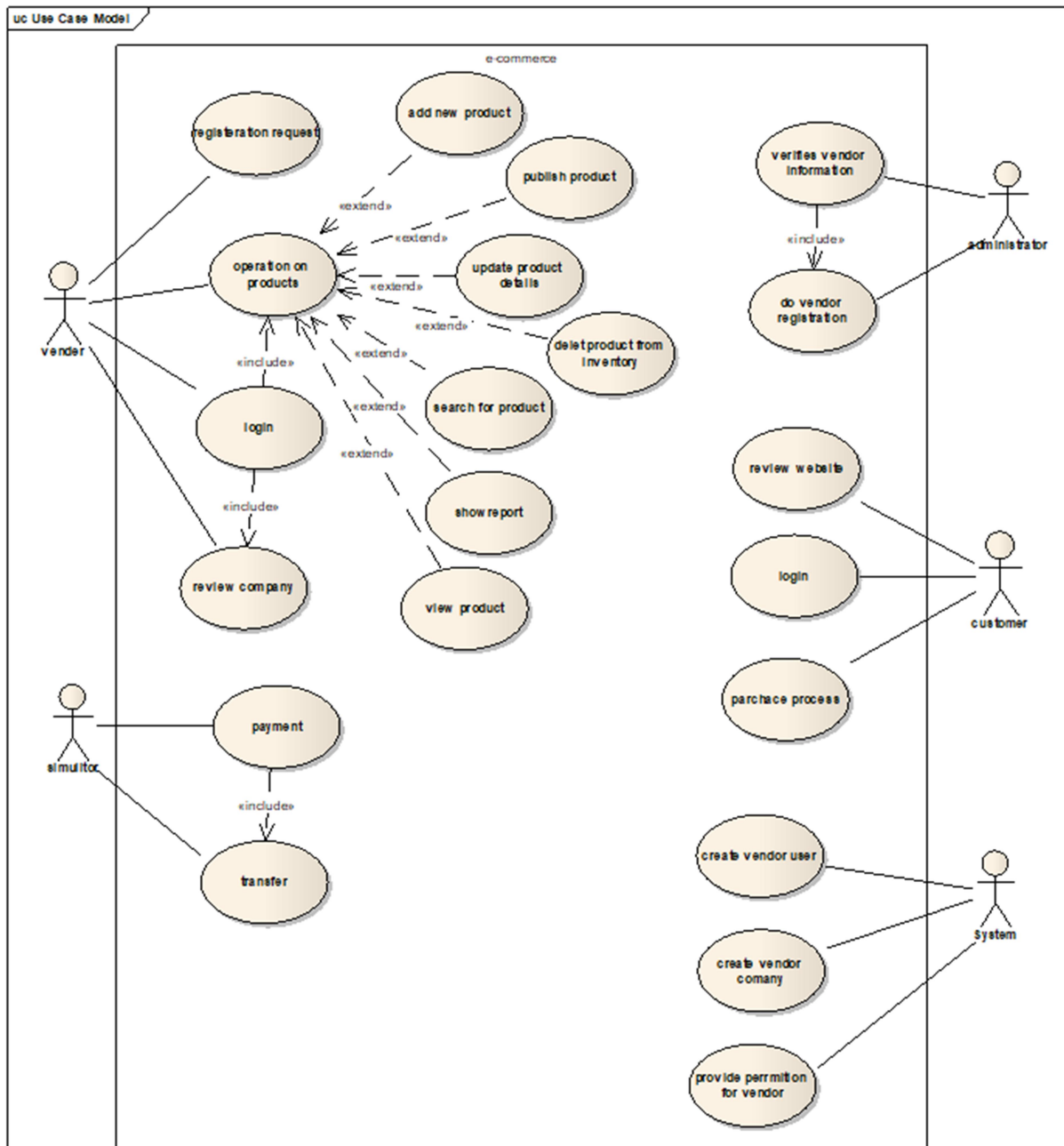


Figure 4.1: Use Case Model

4.3.2 Sequence Diagram

The following diagram describes the process of registration for vendors:

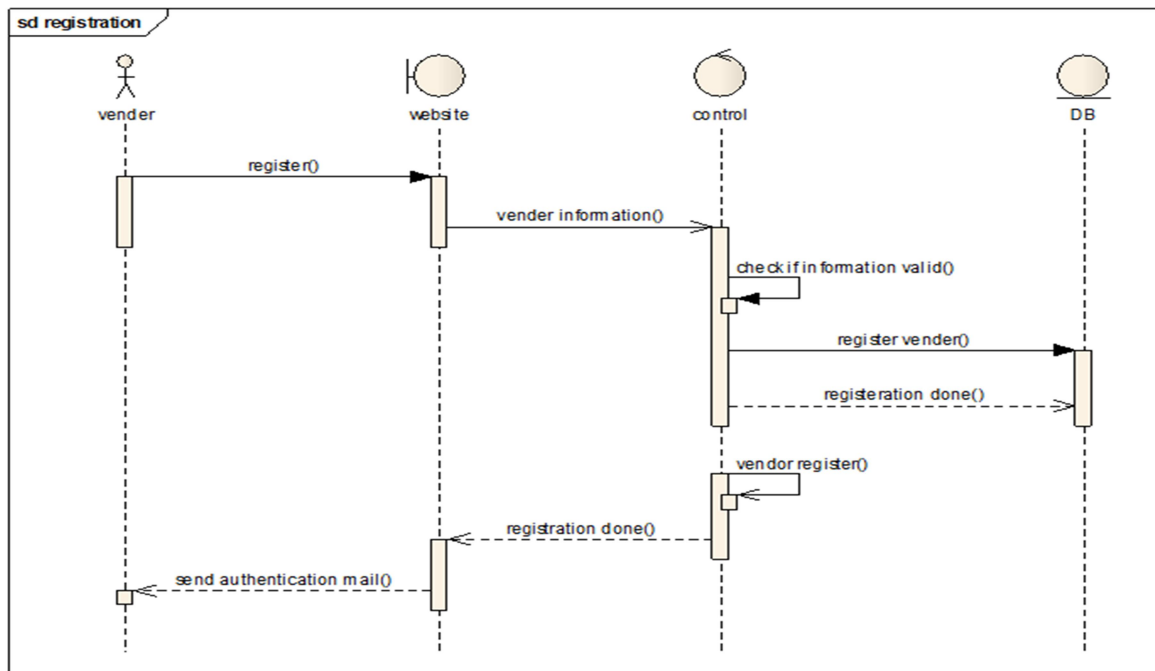


Figure 4.2: Sign up

The following diagram describes the process of login for vendors:

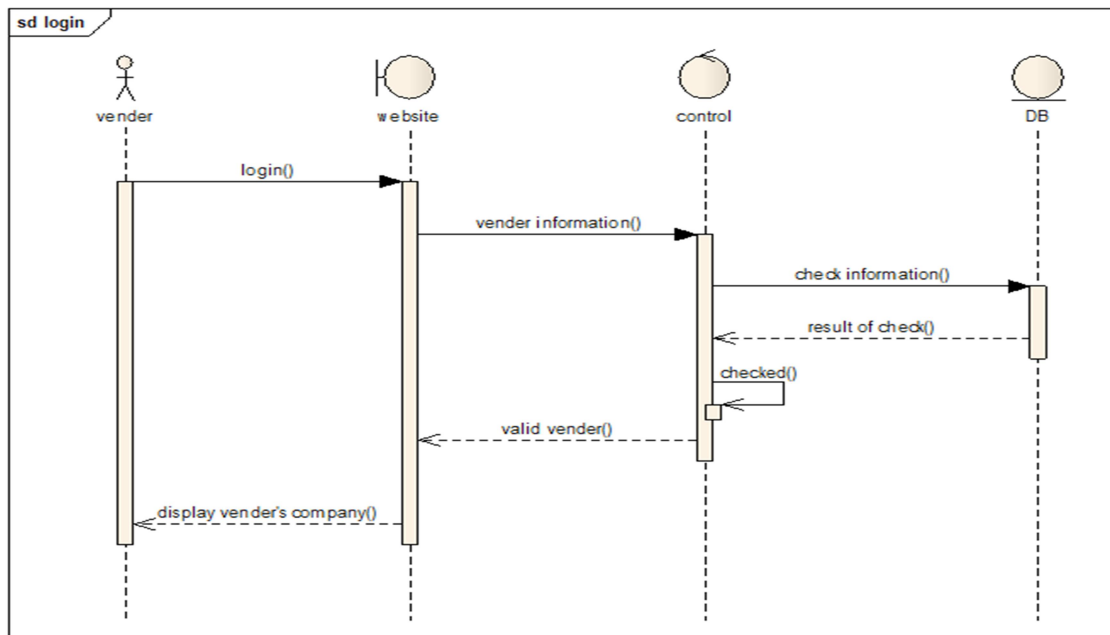


Figure 4.3: Sign in

The following diagram describes the process of payment for customers:

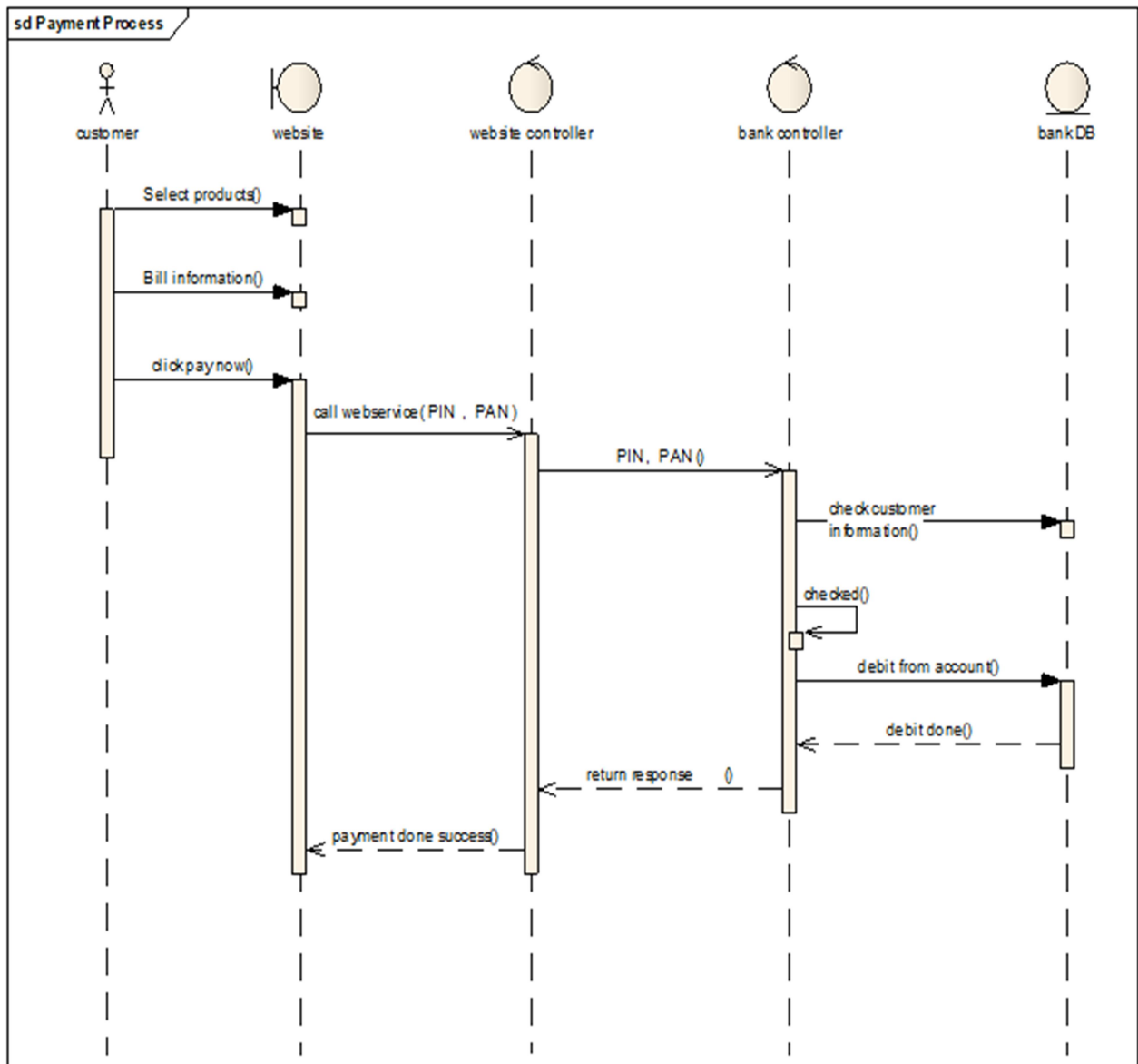


Figure 4.4: Payment process

4.3.3 Activity Diagram

The following diagrams display all activities of the system:

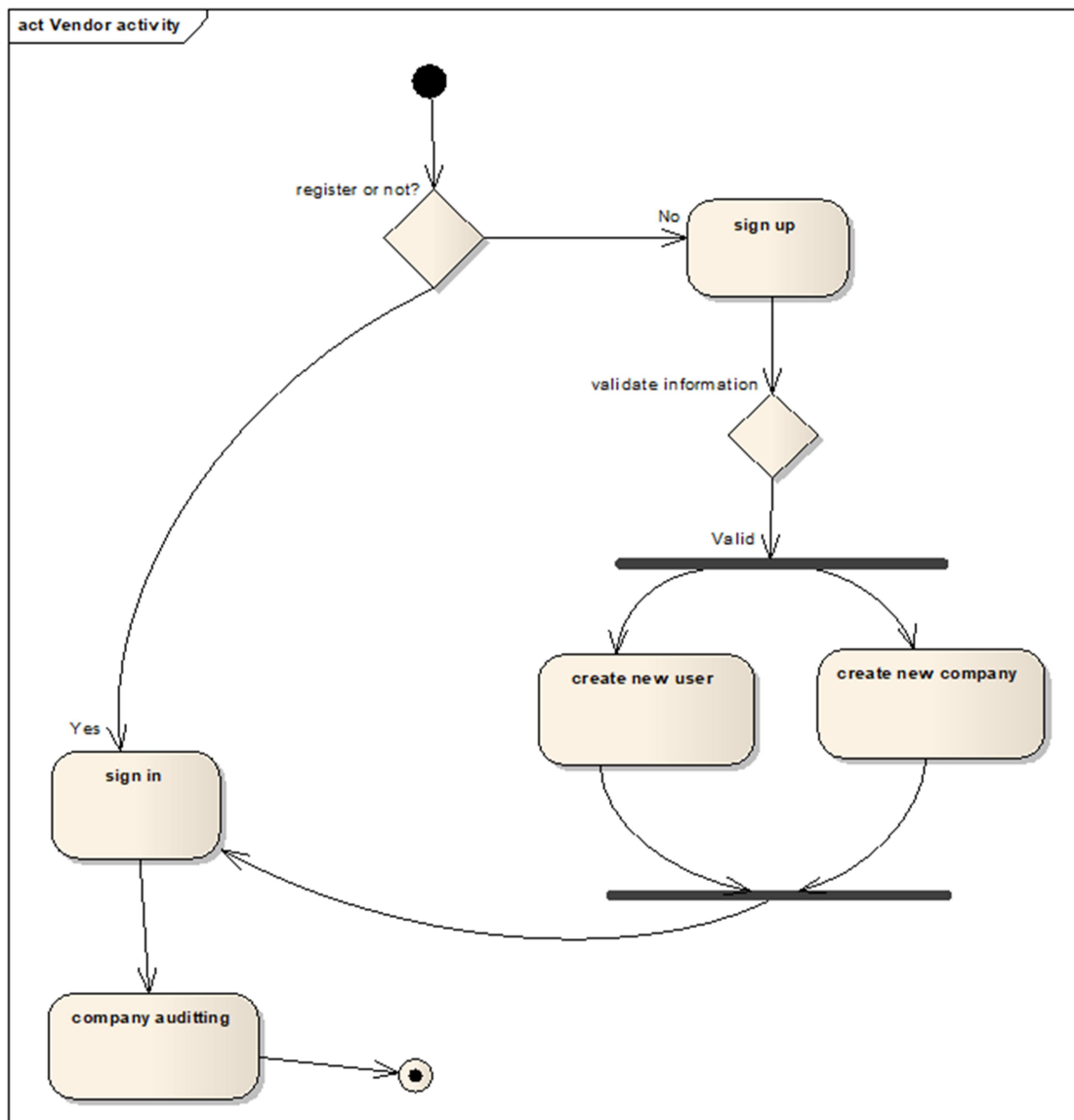


Figure 4.5: Vendor activities

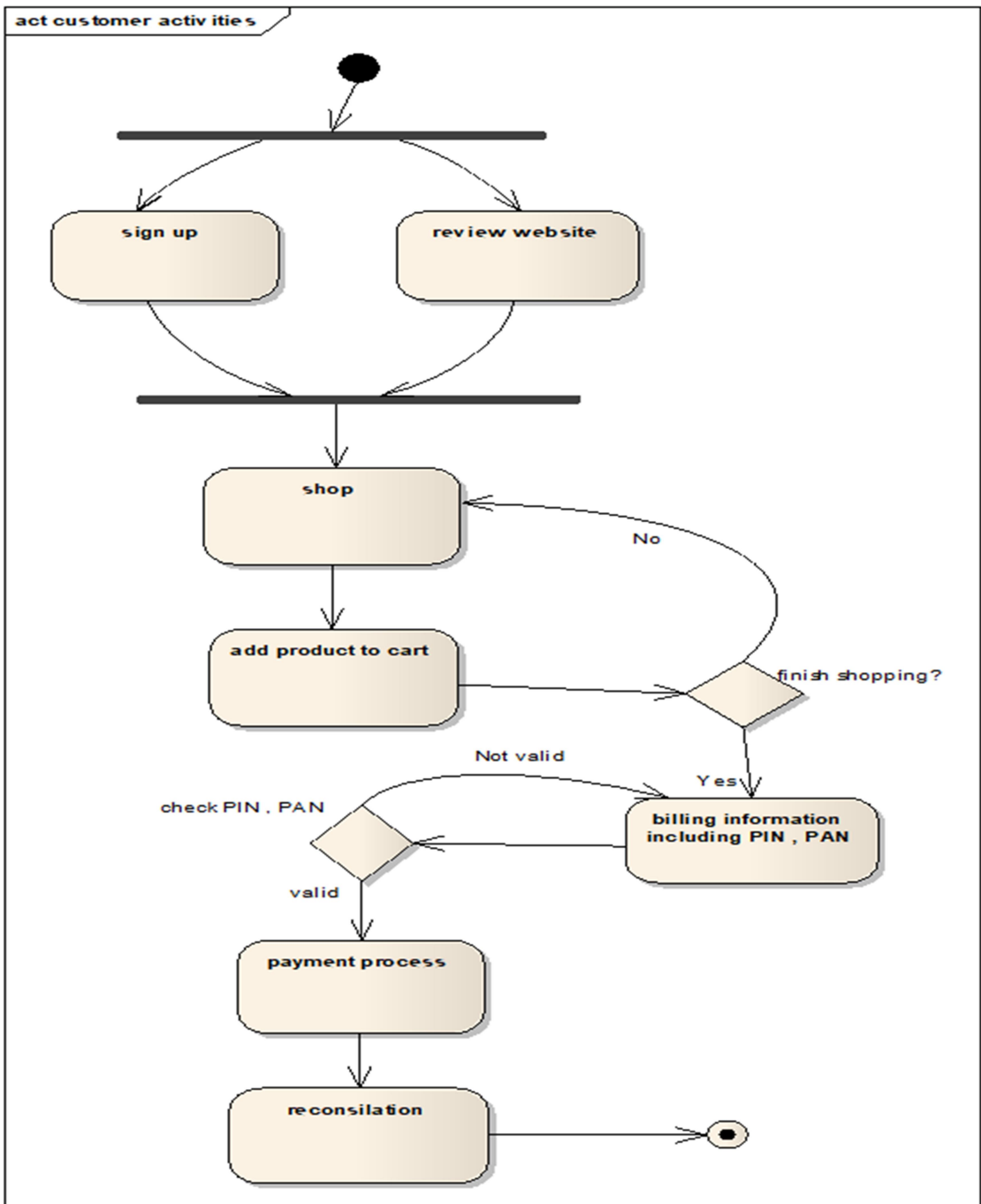


Figure 4.6: Customer activities

CHAPTER FIVE
SYSTEM IMPLEMENTATION

5.1 Introduction

This chapter explains the proposed work that implemented to construct our platform. All of these operations are mentioned clearly in this chapter.

5.2 ERP Software System

To achieve the goal exposed previous proposed to use odoo9. Enterprise Resource Planning (ERP) systems are software used by companies to coordinate their business.

ERP software supports the efficient operation of business processes by integrating tasks related to sales, purchasing, accounting, warehouse management, website builder, manufacturing, e-commerce.

5.2.1 Concept and modules we need

1. Website Builder.
2. E-commerce (by default with this module, the system needs also the sales management module and invoicing module).
3. The concept of multi-company.
4. The concept of multi-language.
5. Accounting, inventory, sale, and purchase.
6. Concept of the outgoing mail server
7. External client authentication.

5.2.1.1 Website Builder

Effortlessly creates custom designs for product pages to showcase your business in a unique way ,drag & drop building blocks to snap your designs into place and showcase your inventory ,add product attributes such as color, size, or style to keep product lines easy to navigate and edit product pages with ease to always have your product information displayed the way you want it to be seen.

To install the website builder module, after login as administrator, at the initial page of the Odoo it is listed all the applications available for the Odoo version 9.

To install it is necessary to click the button “Install” for the Website Builder section as show in figure 5.1 :

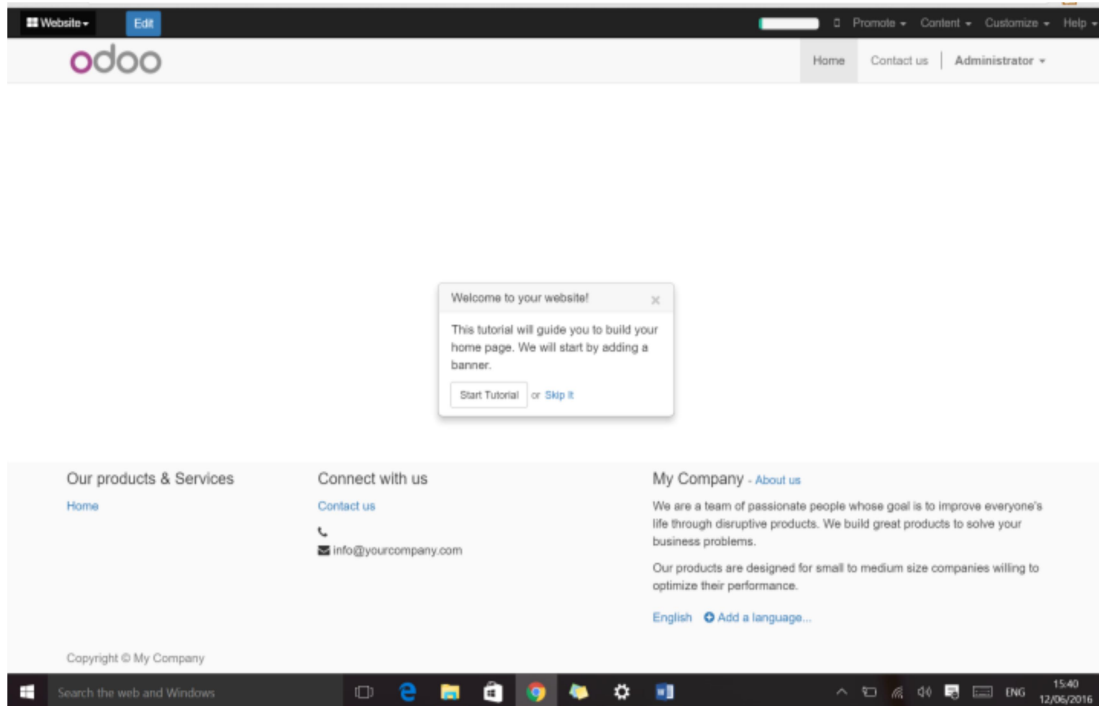


Figure 5.1: Show website builder after installation

5.2.1.2 E-commerce

It is fully integrated with accounting, inventory, sale, purchase and website builder modules.

With an integrated e-commerce platform, inventory and sales can easily be maintained via automatic stock adjustments and reporting. Dedicated customer portals help keep customer data organized with order tracking and claims, allowing customers to download invoices and delivery orders as well as view pending shipments from a single location.

The e-commerce application is installed just click the “Install” button in the application section. By default, this module will install also the applications of sales management and invoice as show in figure 5.2, to manage all the sales process once the client contracts an online product.

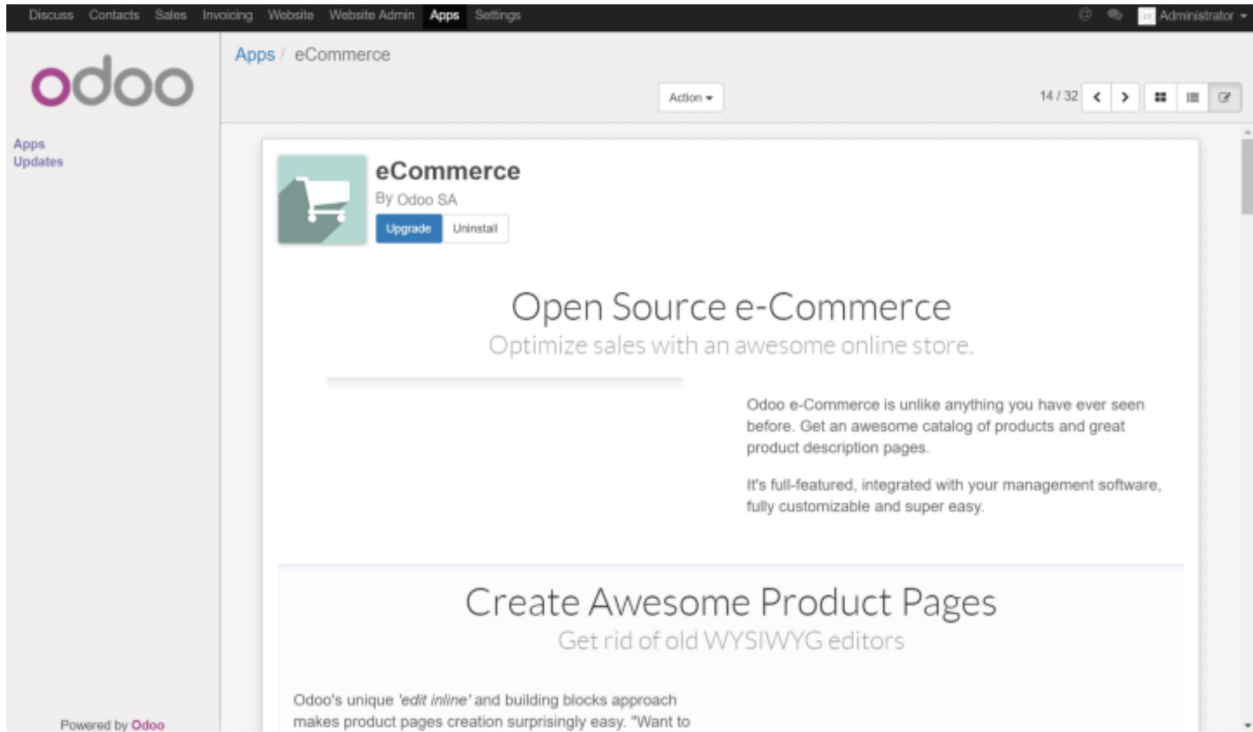


Figure 5.2: E-commerce module installation details

Once the e-commerce module is installed, it should be added all the services offered by the managing business:

1. Login as Administrator
2. Go to the SALES section, and then the product subsection.
3. Click on “Create”, to create a new product.

Figure 5.3 shows the template of the product creation.

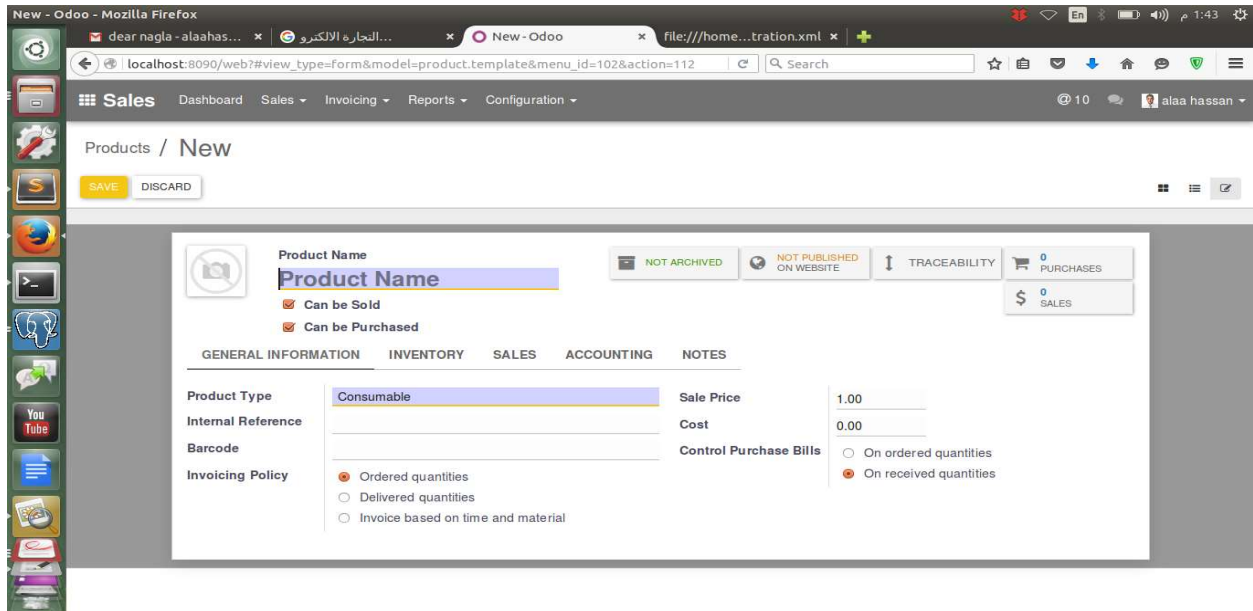


Figure 5.3: Creation of products

To display the product at the e-commerce section change the option “Not published” to “Published”.

5.2.1.3 Multi-company

Managing in the same database different companies that share information. It is not a module, just access rights, and visibility.

We did configuration to enable using this concept as show in figure 5.4 and 5.5:

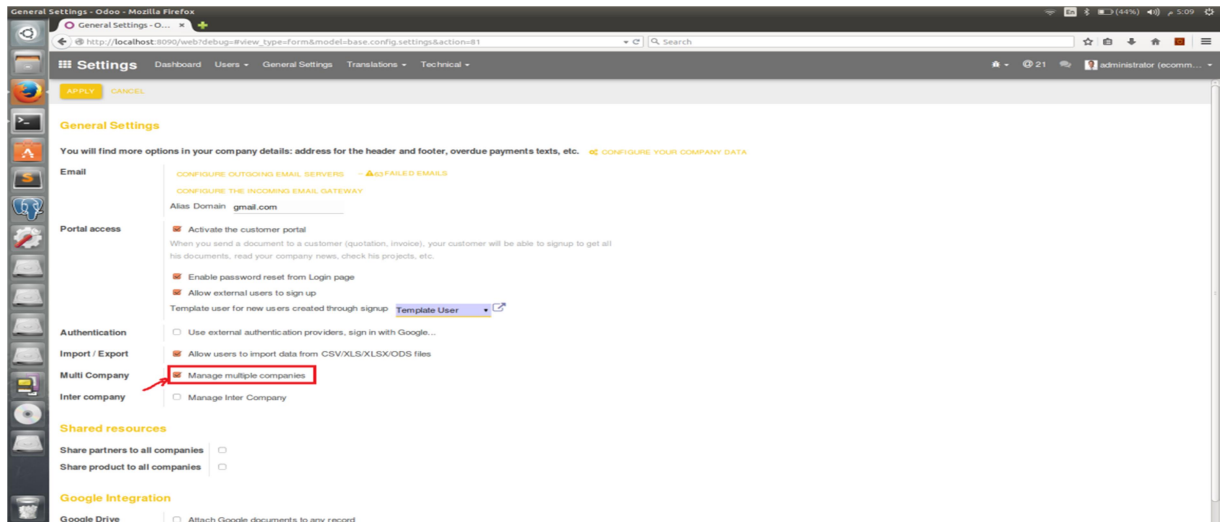


Figure 5.4: Enable Multi Companies in general setting

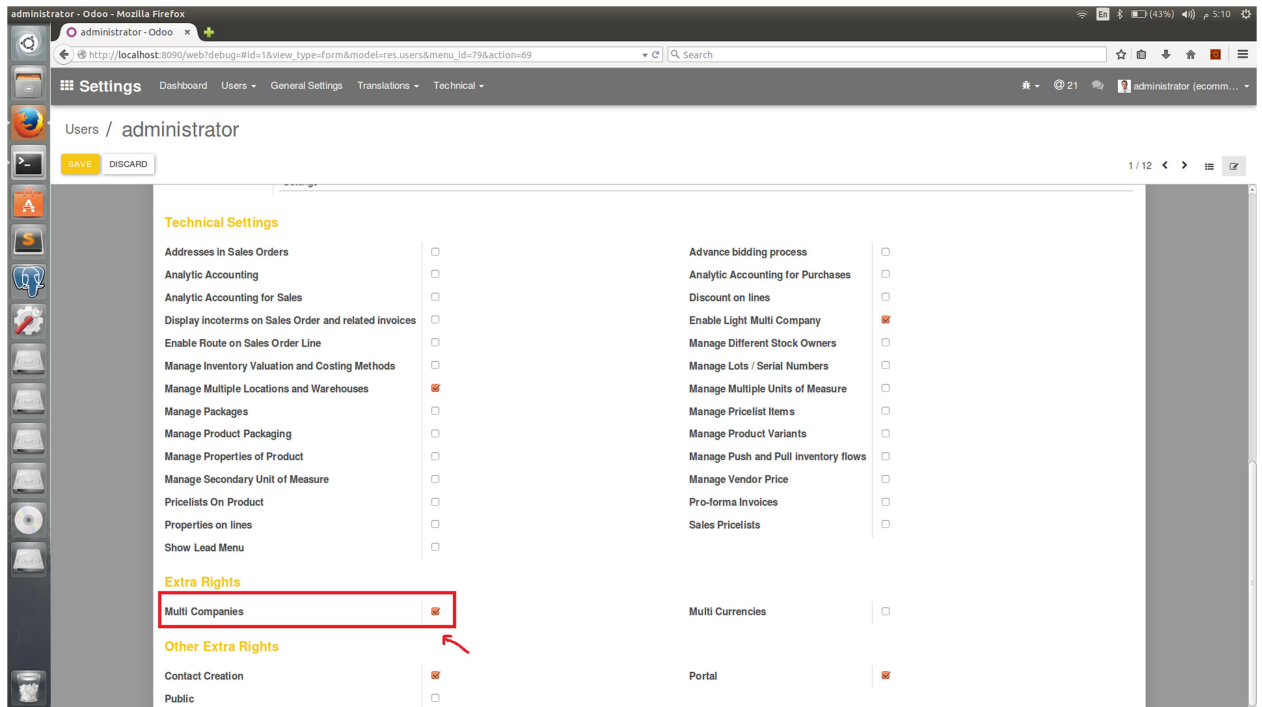


Figure 5.5: Enable multi companies in user /administrator

5.2.1.4 Multi-Language

One of the most powerful uses of Odoo's Language translation features is that developer can use it to customize terms for a specific business or to use industry-specific terms within Odoo without customizing views or your model. This feature is not just for multiple languages; companies often want to add instructions or change the wording inside an application.

5.2.1.5 Accounting, inventory, sale and purchase

Are modules used to organize the process of business sale, purchase, inventory, and accounting. These are integrated with each other.

5.2.1.6 Concept of the Outgoing mail server

Allows sending email from Odoo to another email server. Configuring outgoing mail servers in Odoo is one of the simplest things, you just need to know what exactly you should fill in.

First, go to Settings => Email => Outgoing Mail servers and click on Create.

You will get a new window as show in figure 5.6:

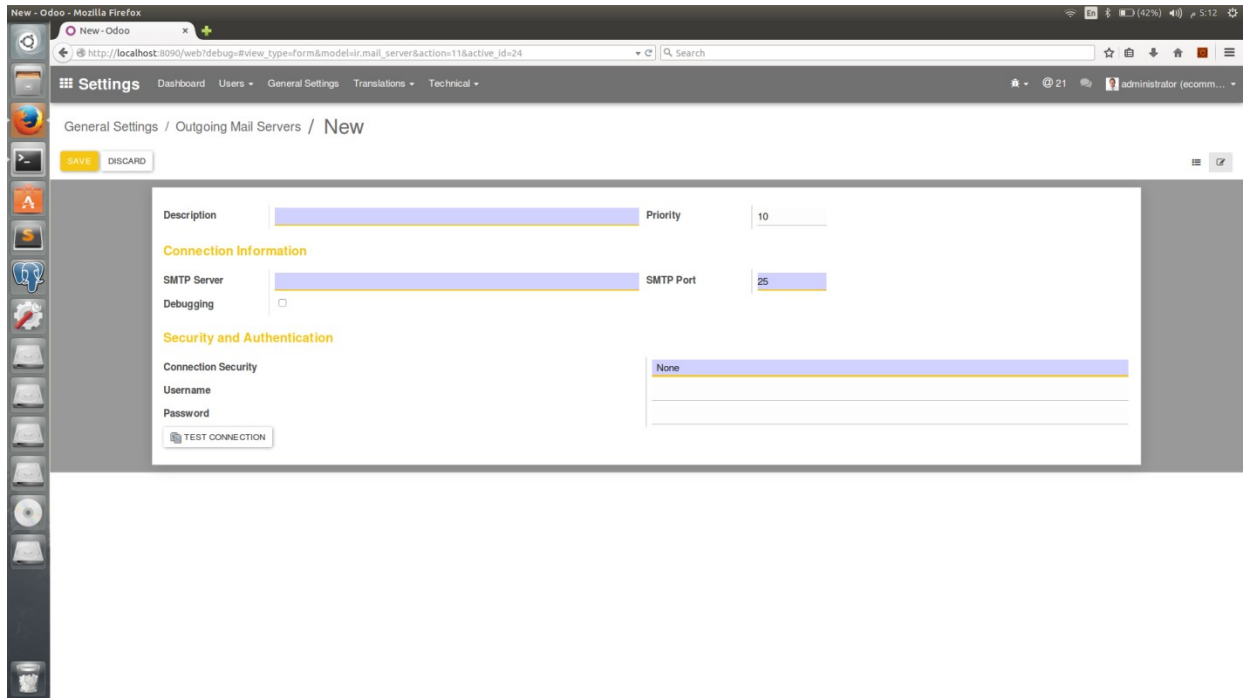


Figure 5.6: Outgoing mail servers

Fields in figure 5.6 should contains:

- Description: A description for the outgoing mail server.
- Priority: The priority of your mail server. The lower the number the higher the priority. This will mean that the e-mail server with the lowest number will be used the most.
- SMTP server: The pointer to the SMTP of your server, for example, smtp.gmail.com.
- SMTP port: The port of your SMTP server, for example, port 465 for Gmail.
- Connection security: The type of security. You should choose SSL/TLS for Gmail. The data is then sending over HTTPS.
- Username: Your e-mail account, in this example youremail@gmail.com
- Password: The password of your e-mail account.

Figure 5.7 show the fields after filling:

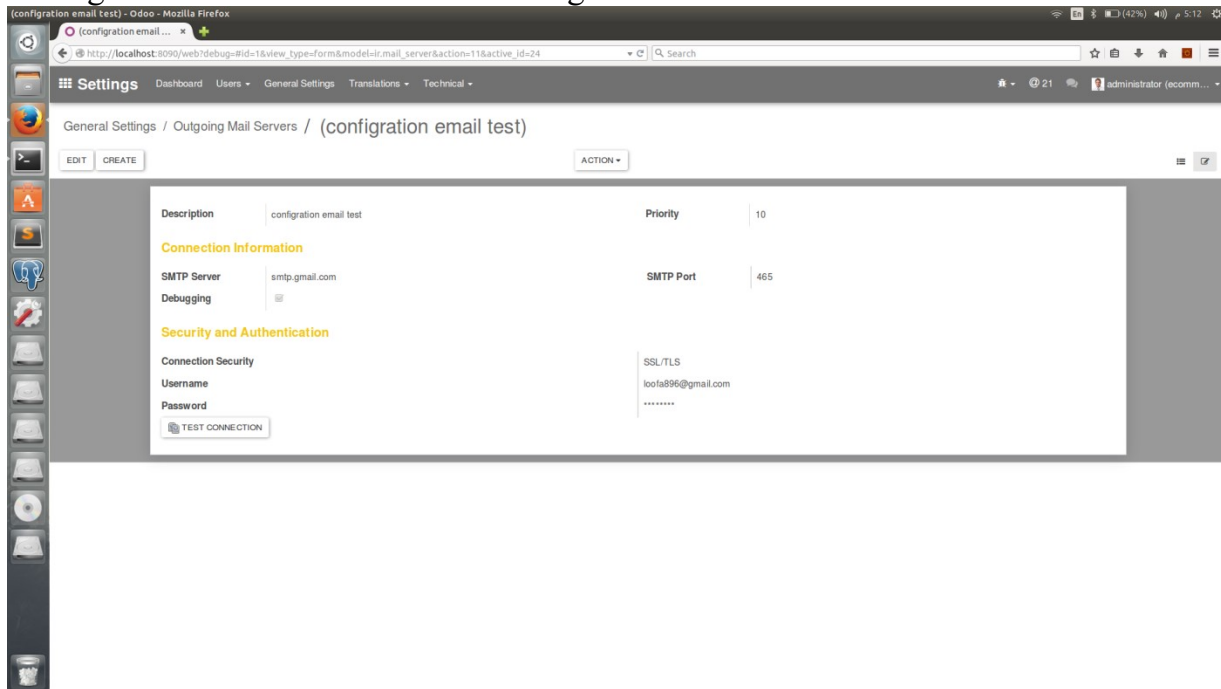


Figure 5.7: Configuration outgoing mail servers

5.2.1.7 External client login

To allow customer to register in website and become user in the system, we should activate External client login

To activate the authentication and new external user registration, it is necessary to log in as an administrator and set the developer mode

Administrator => About => Activate developer mode

That shown in Figure 5.8:

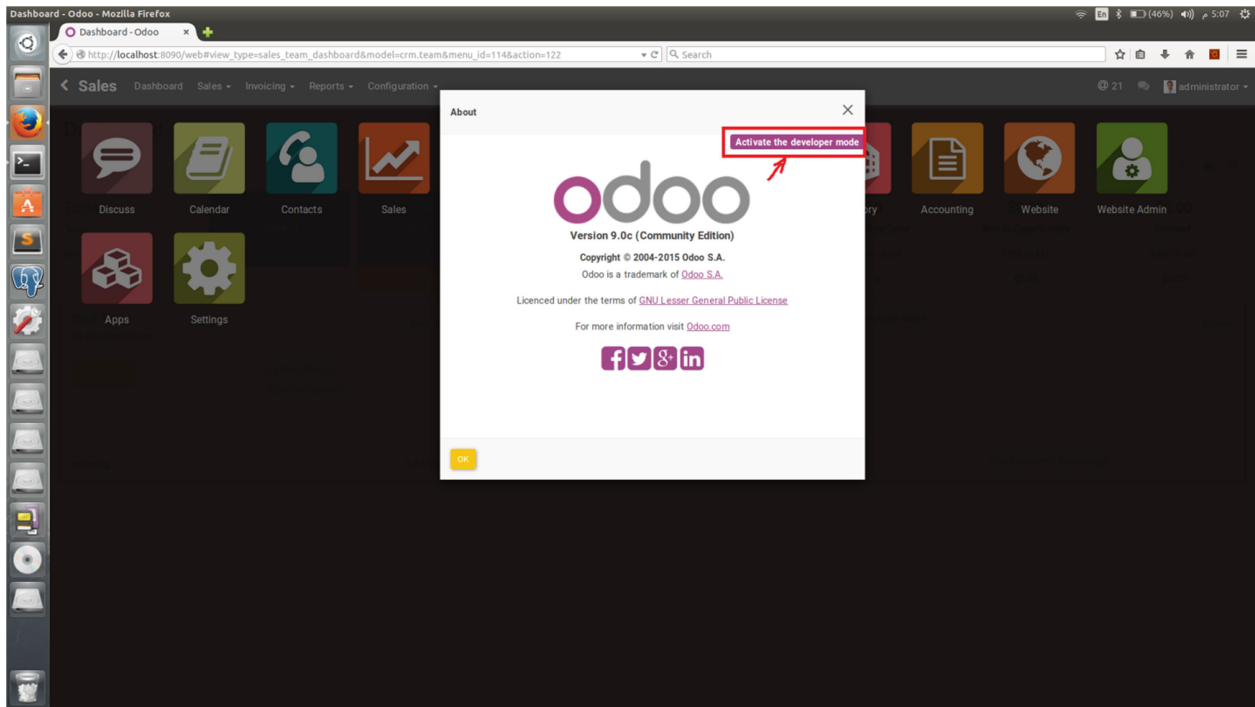


Figure 5.8: Developer mode activation

Then activate the option “Allow the external user to sing up” at the “General settings” options as shown in Figure 5.9 :

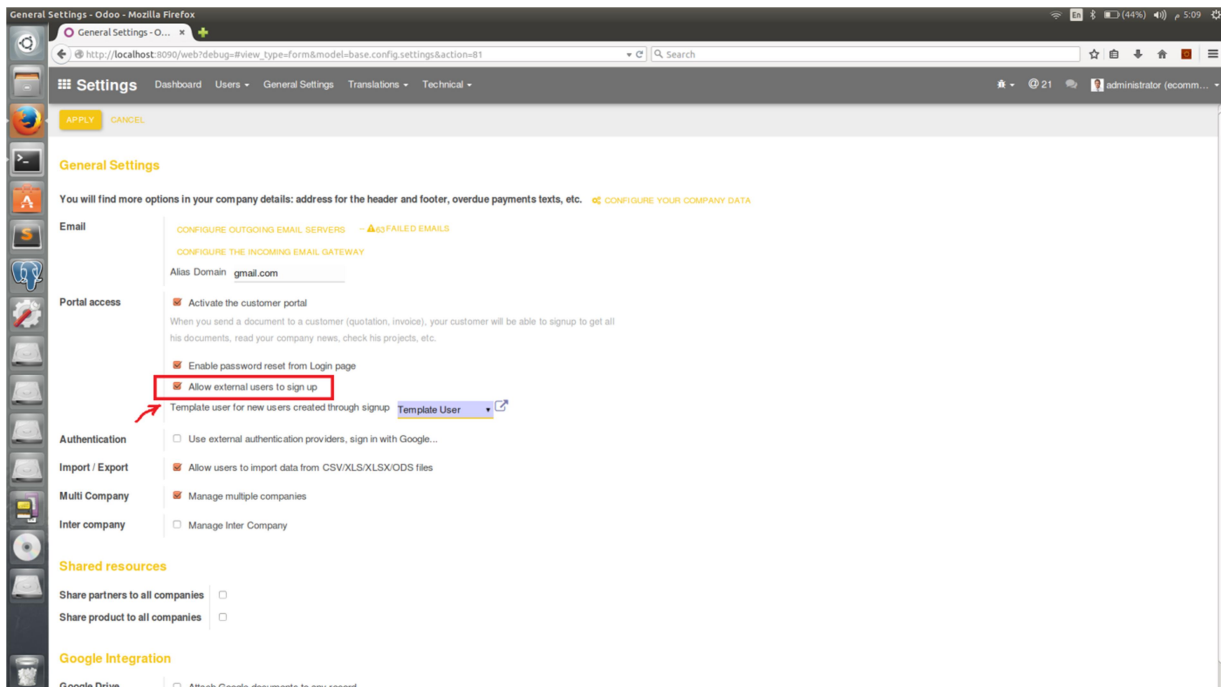


Figure 5.9: Allow external user to sign up

5.3 Concept and modules and its use in project

Module : entity in odoo that need to install and use it.

Concept : is feature in odoo that need to configure then use it.

Concept or modules	Using
E-commerce and website module	It provide, the full infrastructure for all e-commerce processes include (portal for product displaying, searching for it, and all purchasing process).
Accounting, inventory, sale and purchase	They use to satisfy process of organizing vendor business .
Concept of multi-companies	Use to separate vendors business, System Admin represents root company and any other vendors registered as sub company.
Concept of multi-language	Use to translating the language to Arabic.
Concept of outgoing mail server	Use to send an authentication message to vendors .to confirm complete of his registration.

Table 5.1: Modules and its use in project

5.4 How System Works

This system contain three users:

5.4.1 Vendors

5.4.1.1 The process of registration

The user is will be able to register as a vendor as shown in figure 5.10:

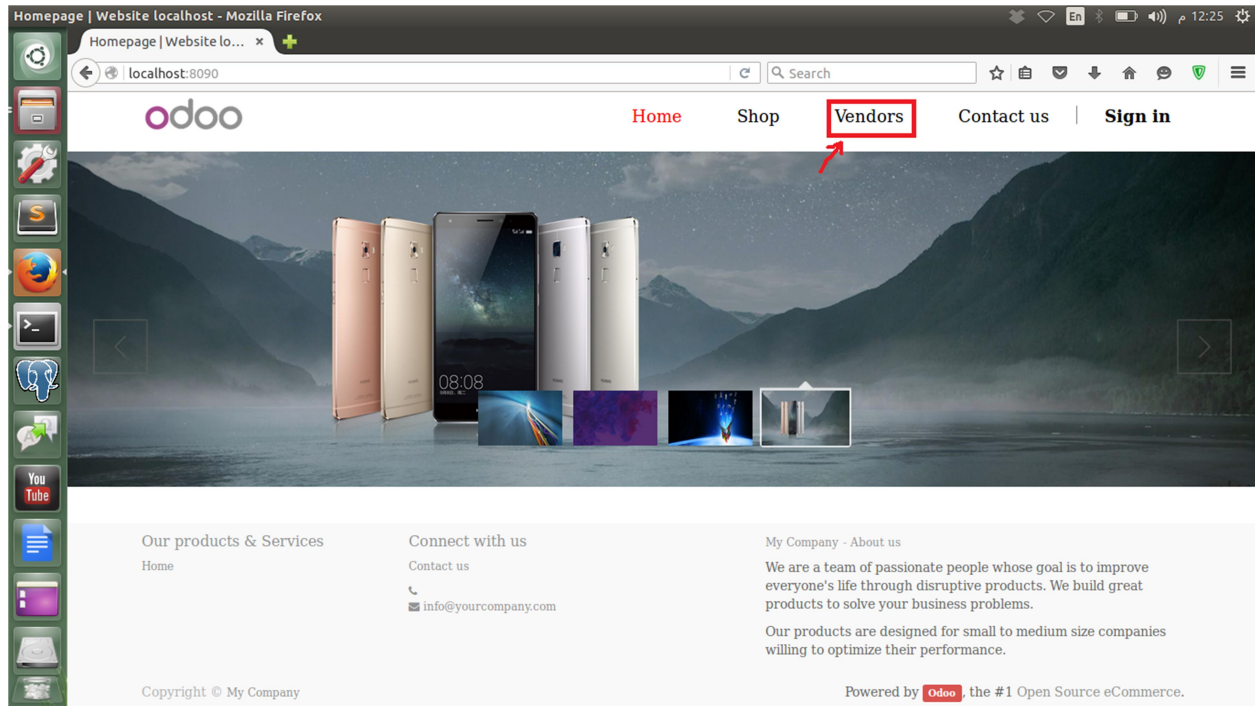


Figure 5.10: Vendor registration

We add a new template for the vendor to enter the necessary information as shown in figure 5.11:

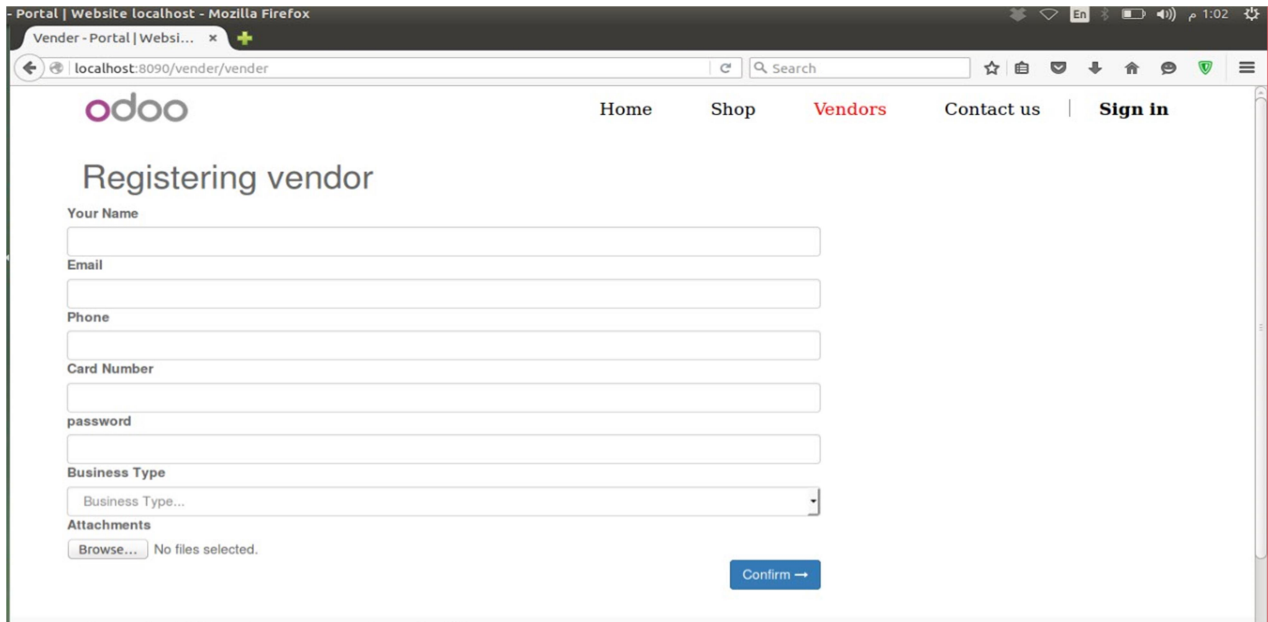


Figure 5.11: Filling information

After filling information the vendor confirms them and waiting until the administrator verifies about his information as shown in figure 5.12:

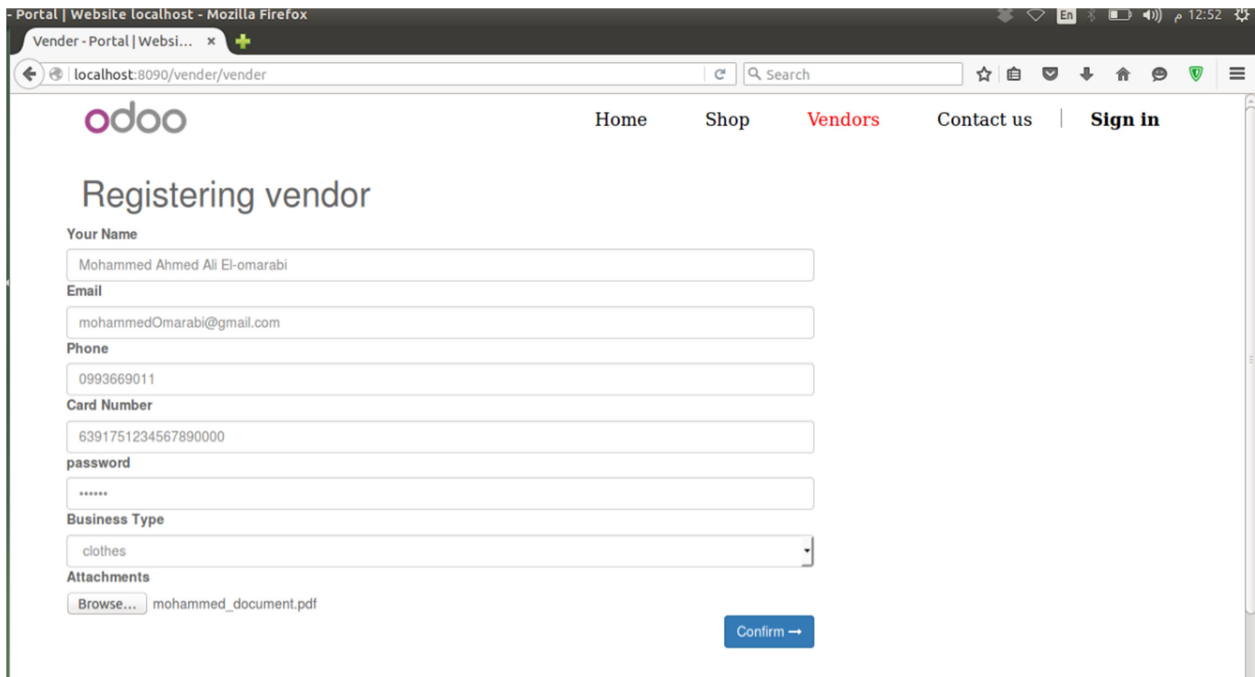


Figure 5.12: Confirm information

After the data submitted successfully the record of the vendor is appeared in the draft state as shown in figure 5.13:

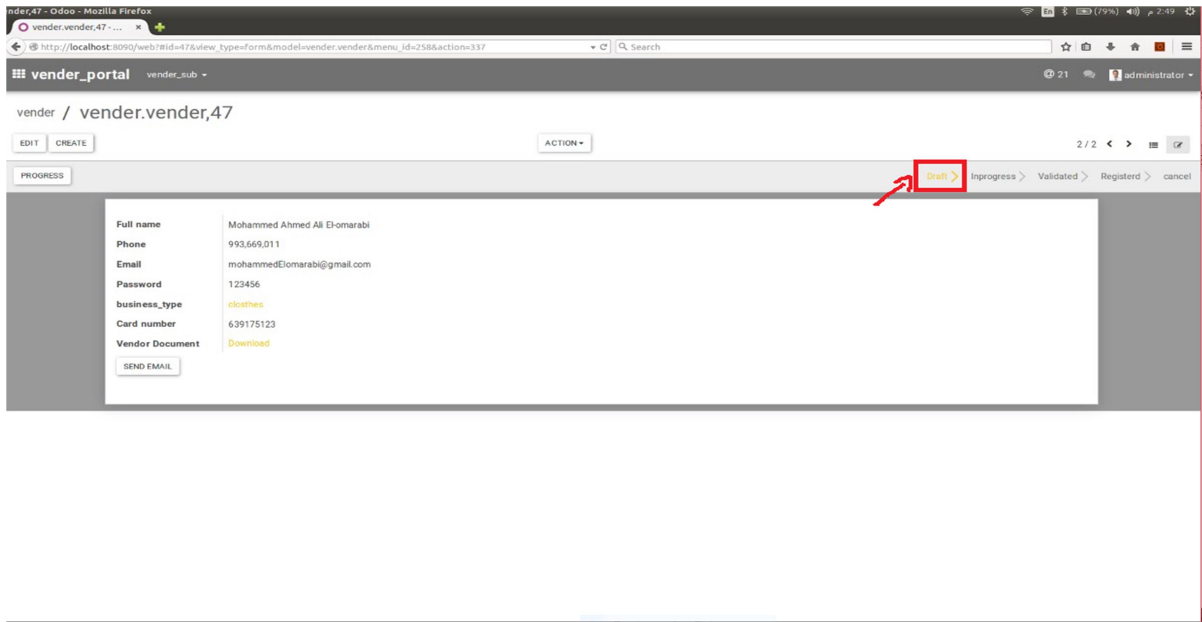


Figure 5.13: Record in state draft

After that, the admin converts the state to validate in this state the admin verify about the document that the vendor attached it as shown in figure 5.14:

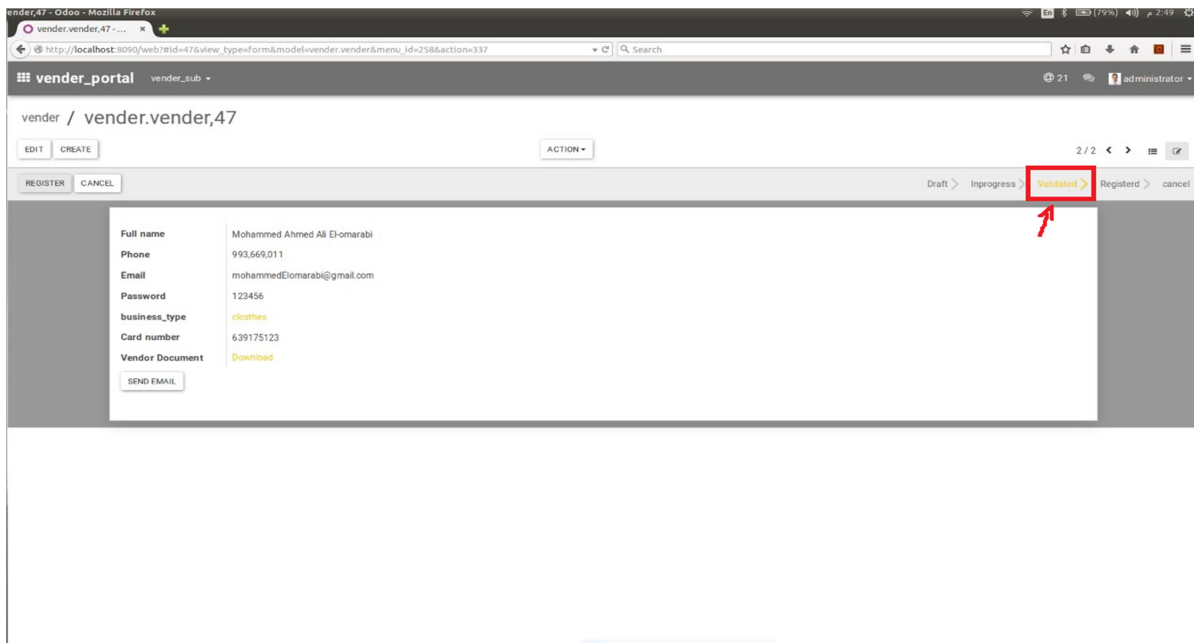


Figure 5.14: Record in state validate

After the administrator verified about the vendor he converts the state to register as shown in figure in 5.15:

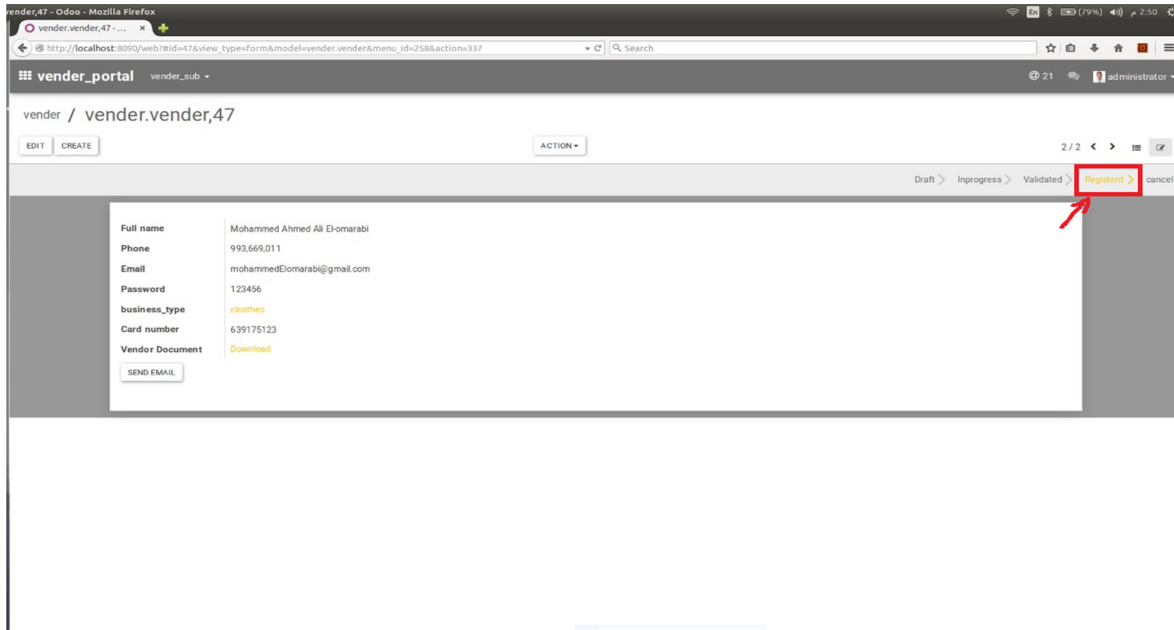


Figure 5.15: Record in state register

In this state, the system automatically creates a user and a company for that vendor as shown in figure 5.16 and 5.17 and provide him with a permission to access the necessary modules such as accounting, inventory, sales, purchase, and website:

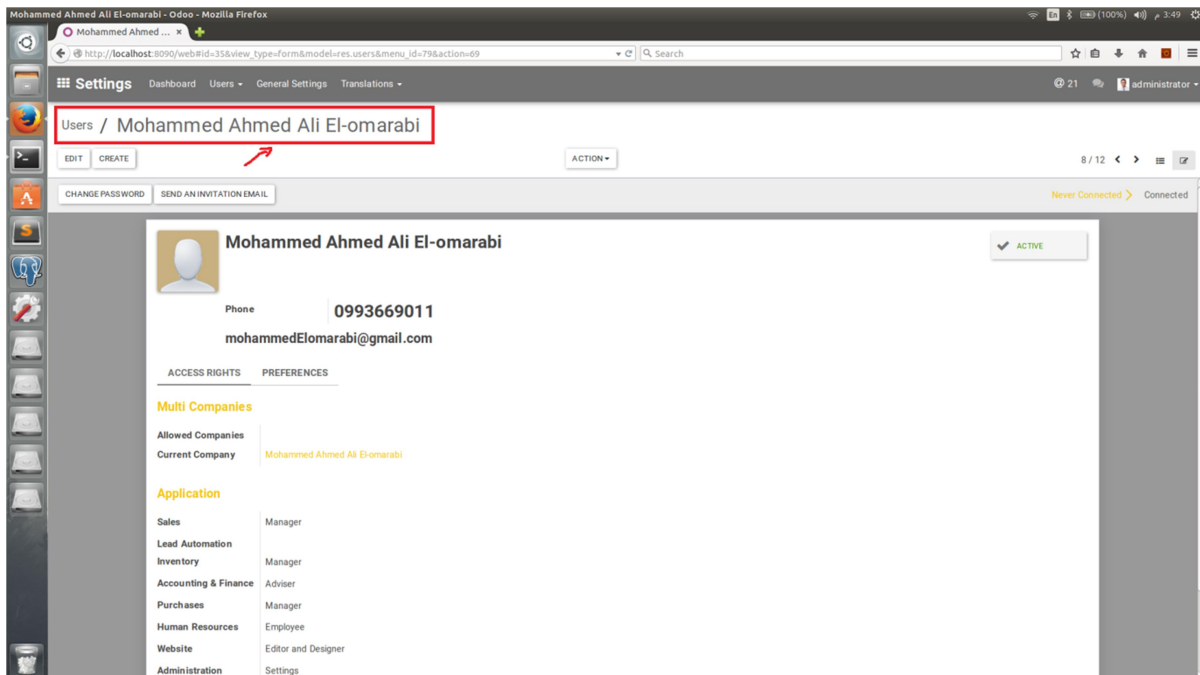


Figure 5.16: Automatically create user

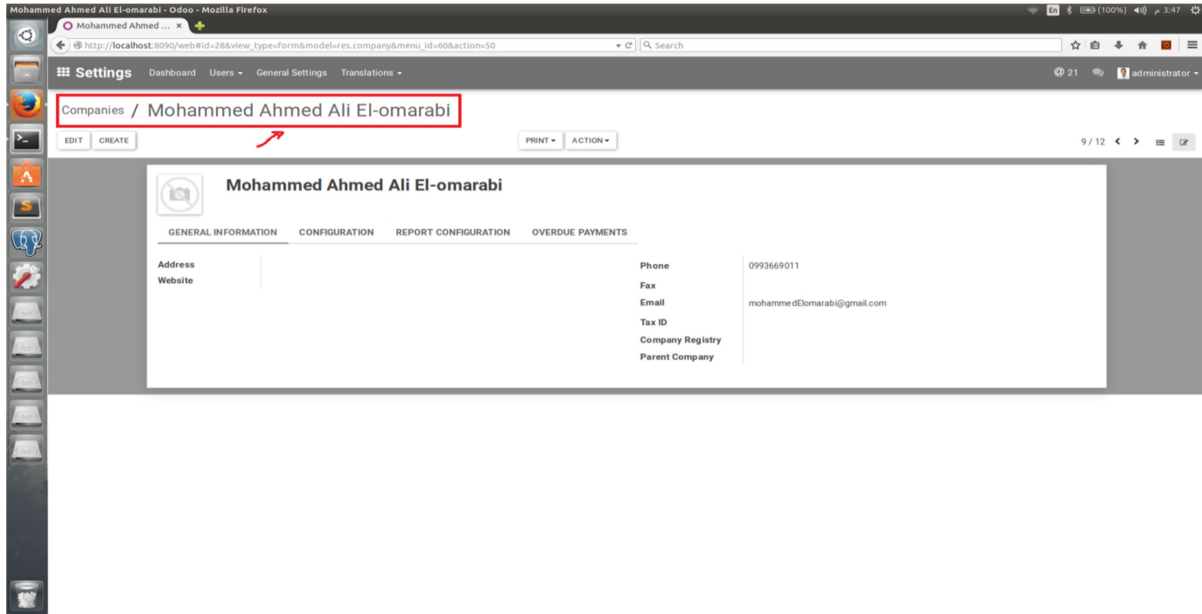


Figure 5.17: Automatically create company

The administrator sends an authentication message that contains the username, password to login to his own company and also contains the address of the server as shown in figure 5.18:

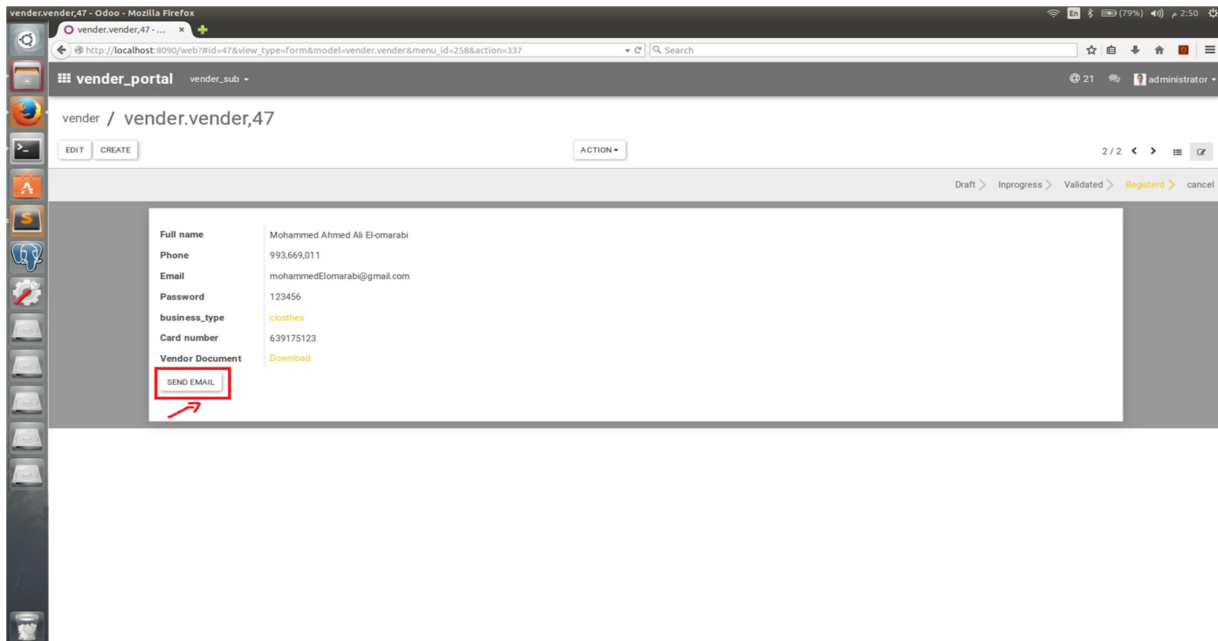


Figure 5.18: Send an authentication message

The vendor receives the email and goes to the URI to login as shown figure 5.19:

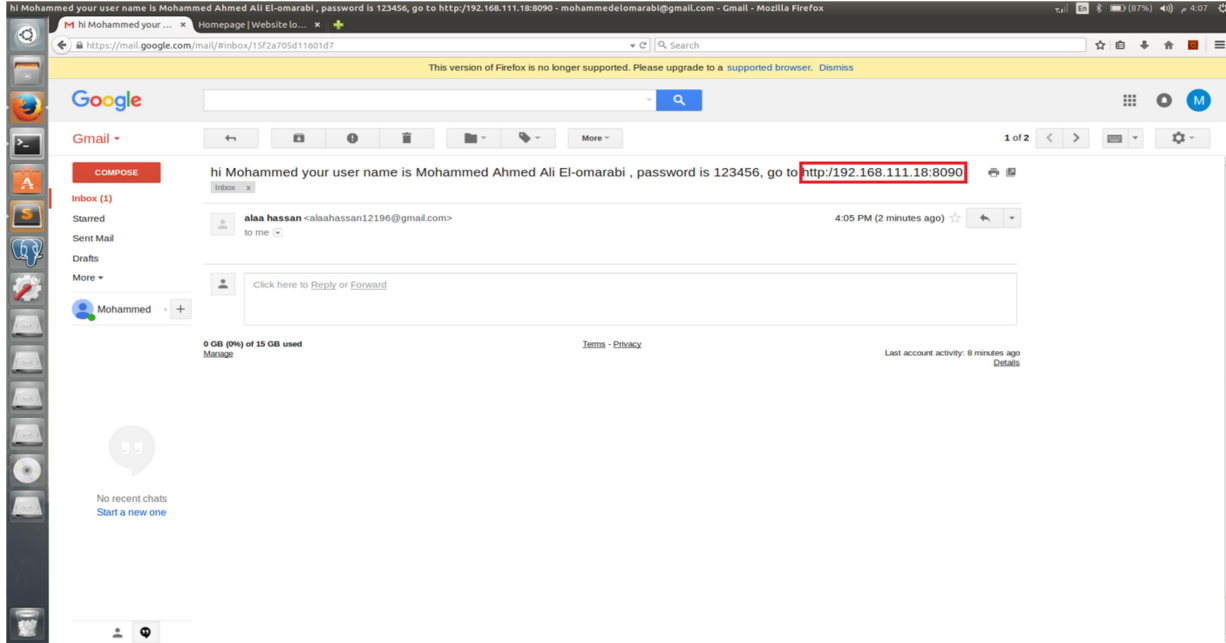


Figure 5.19: Receives an authentication message

User goes to login page and enters the email and the password as shown in figure 5.20:

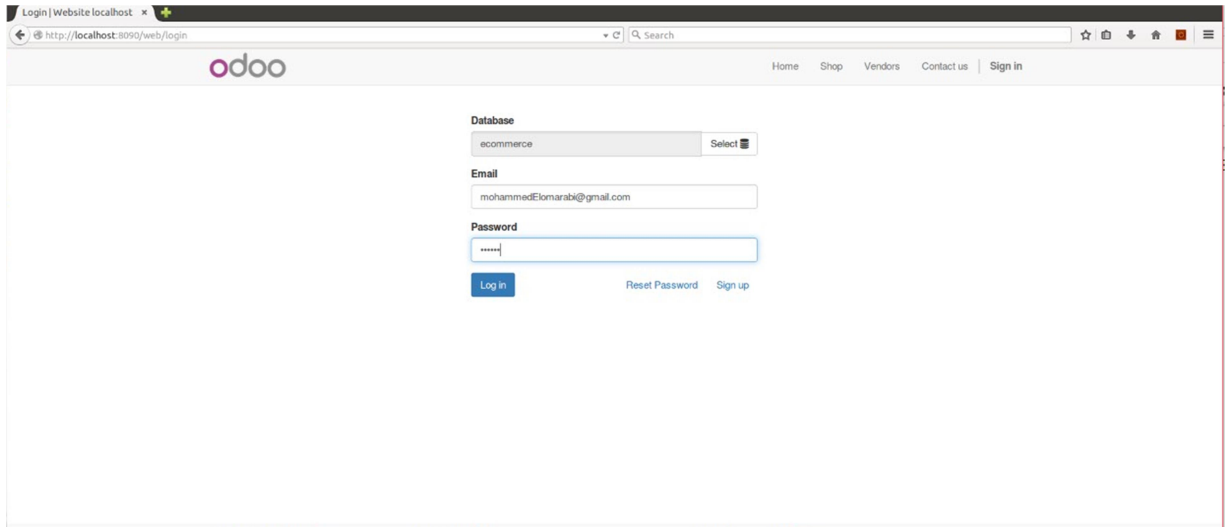


Figure 5.20: Login as vendor

Finally, the vendor entering to his own company and has a full control over it as shown in figure 5.21:

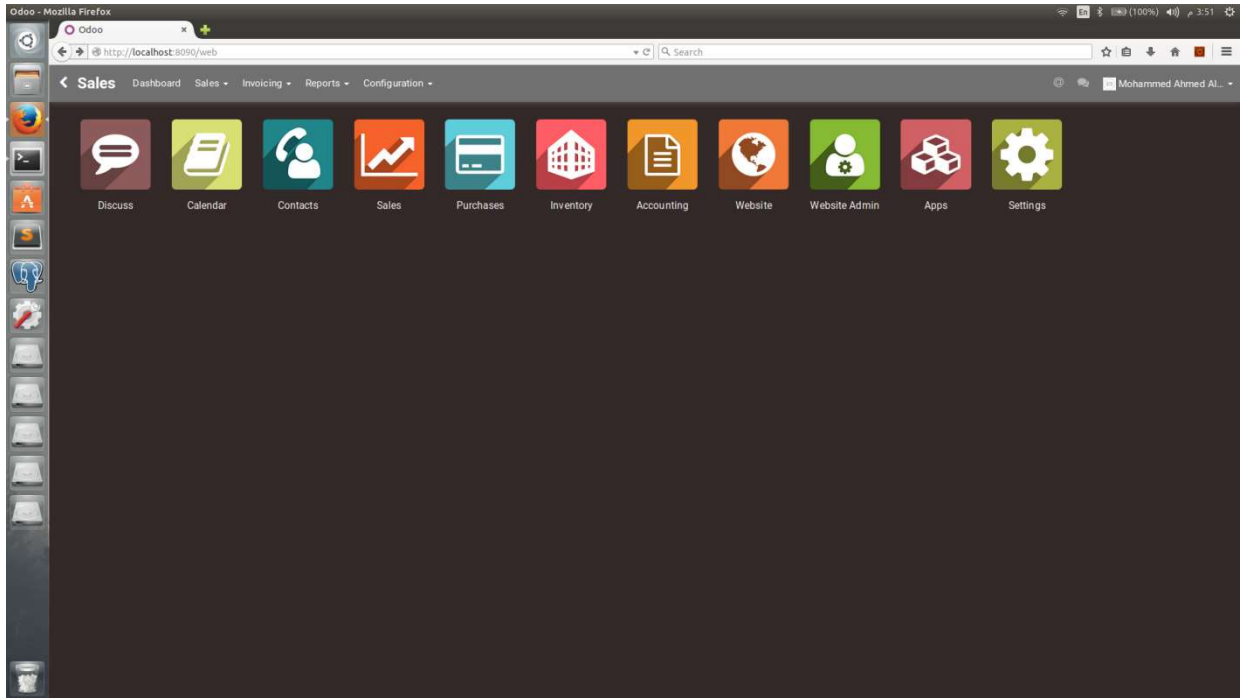


Figure 5.21: Vendors entering to his own company

5.4.1.2 Reports provided by the platform

- **Sales reports for a specific period**
We create PDF report for the vendor to show any vendors sales of specific product or products in a specific period of time as shown in figure 5.22.

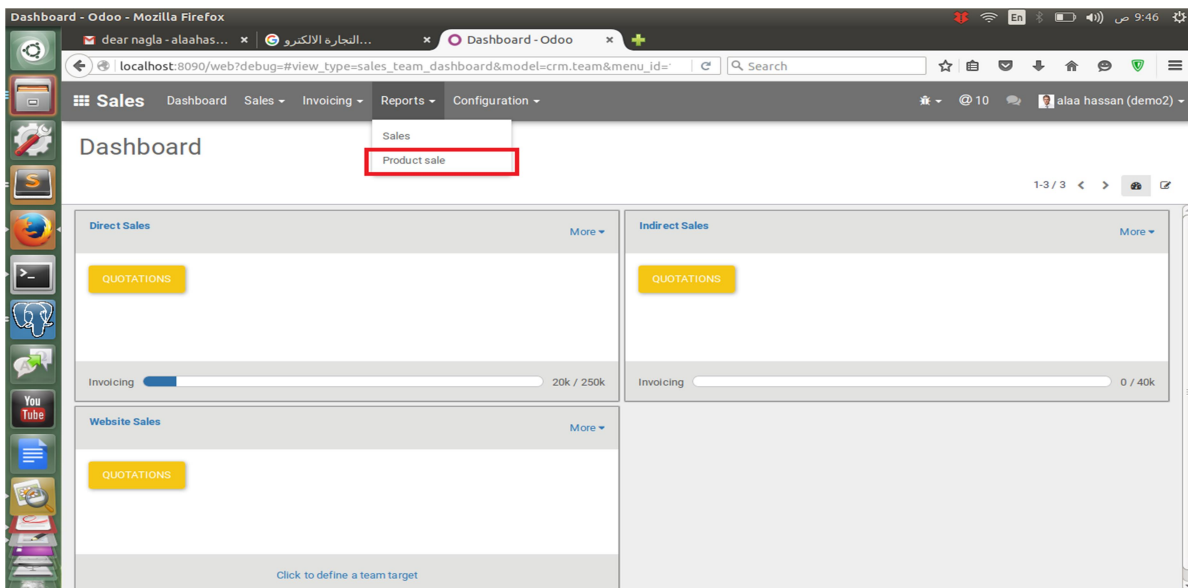


Figure 5.22: Vendor reports in specific period

System show form for the vendor to enter products he wants to show this sale and specify product and range of date as shown in figure 5.23:

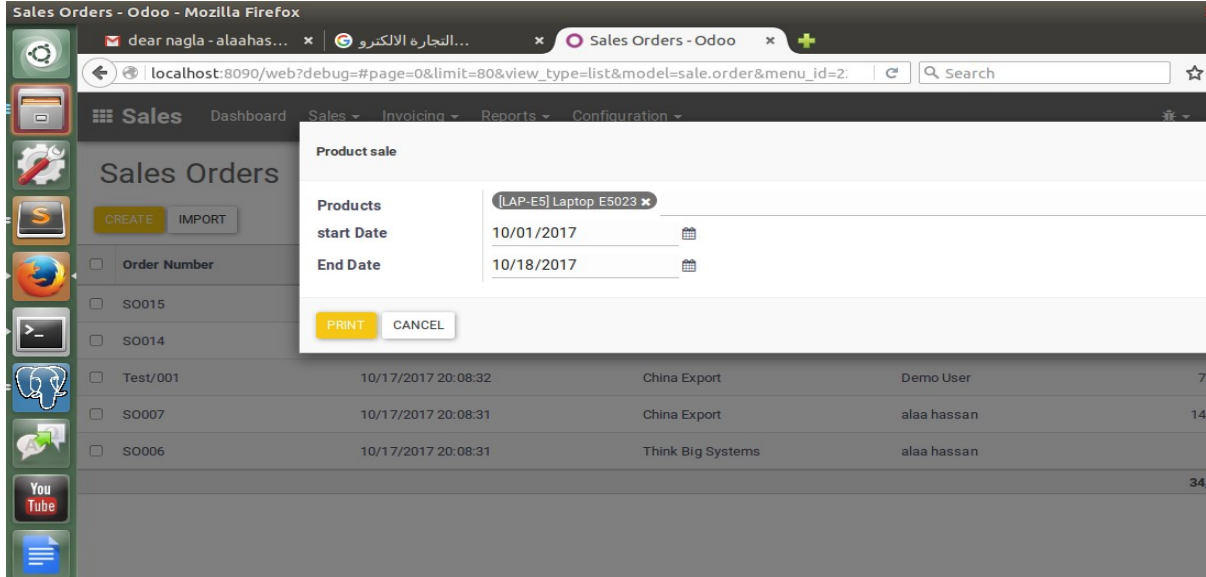


Figure 5.23: Vendors form to specify product and range of date

The system shows all product detail for a specific vendor in specified time as shown in figure 5.24:

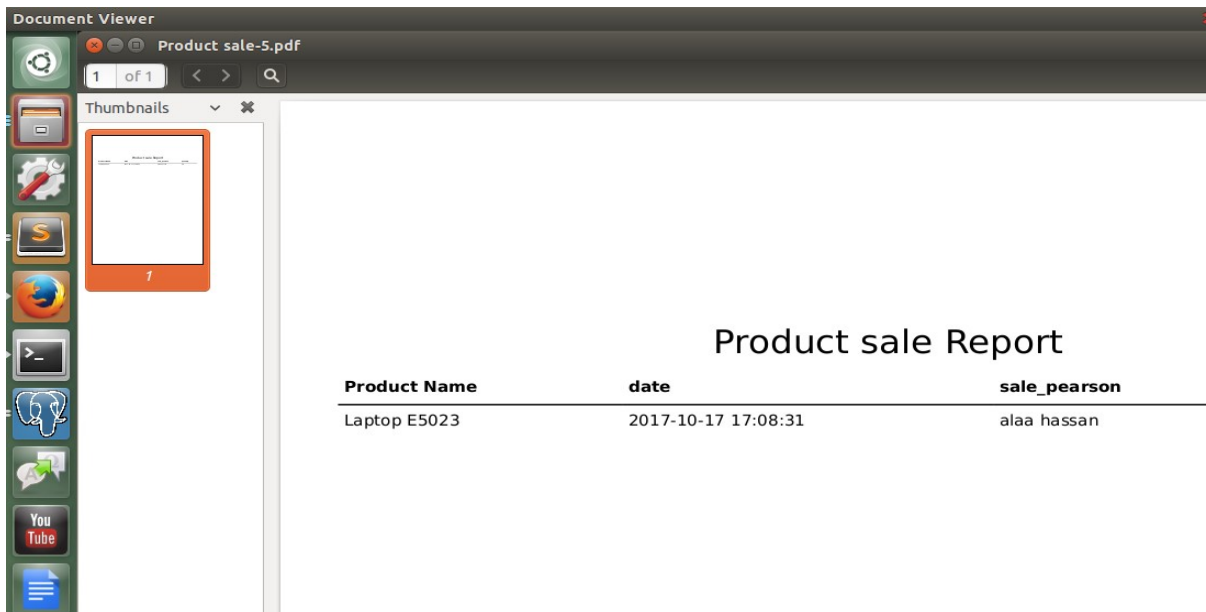


Figure 5.24: Vendors reports

If a vendor did not specify product and he determines the range of the date the system shows all products that bought in a specific rang as shown in figure 5.25:

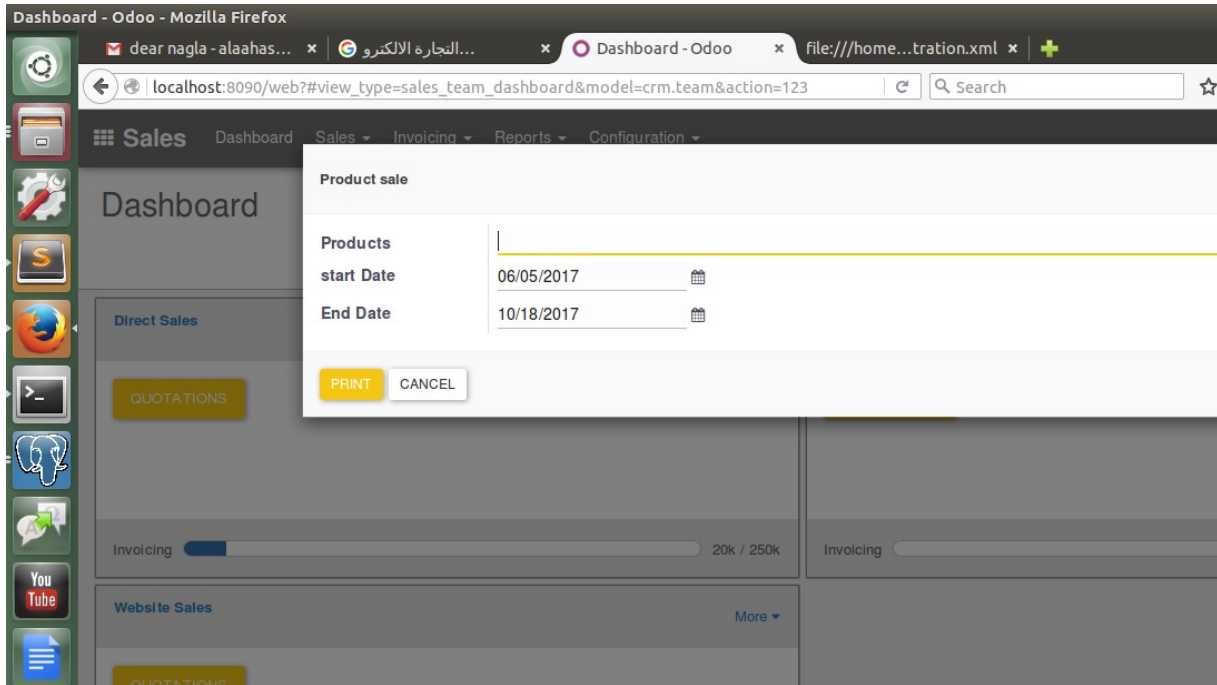


Figure 5.25: Vendors report if determines only range of date

The system shows all product details that bought in this rang as shown in figure 5.26:

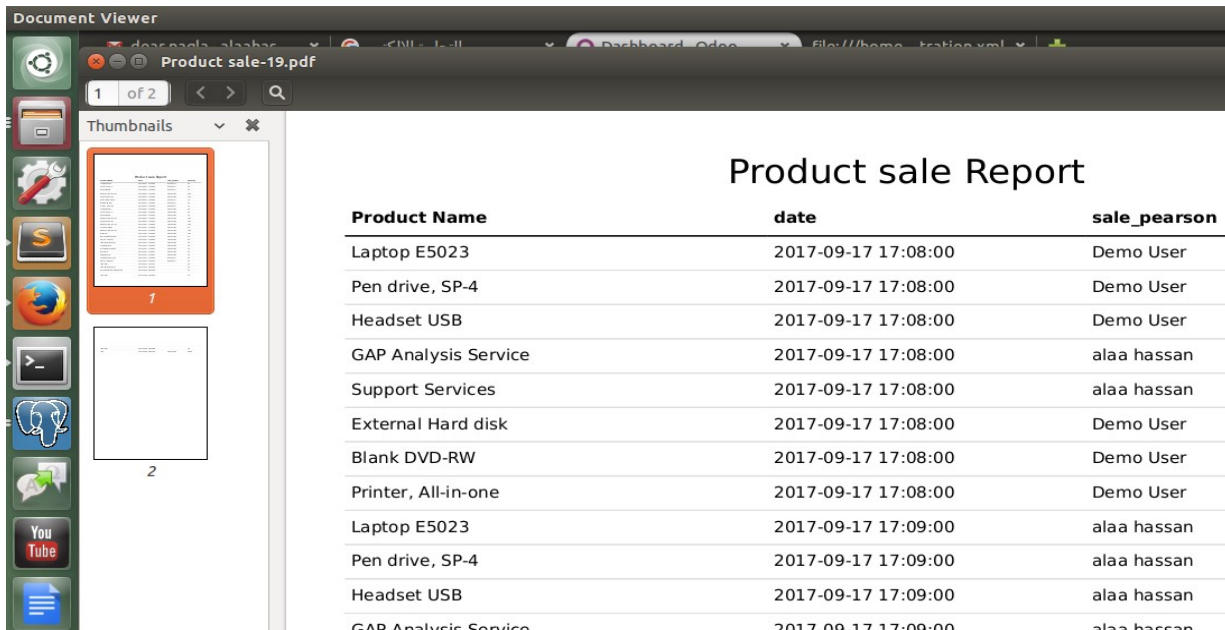


Figure 5.26: Show all products those sales in this range

Otherwise, if he specifies product and did not determine rang of date as shown in figure 5.27:

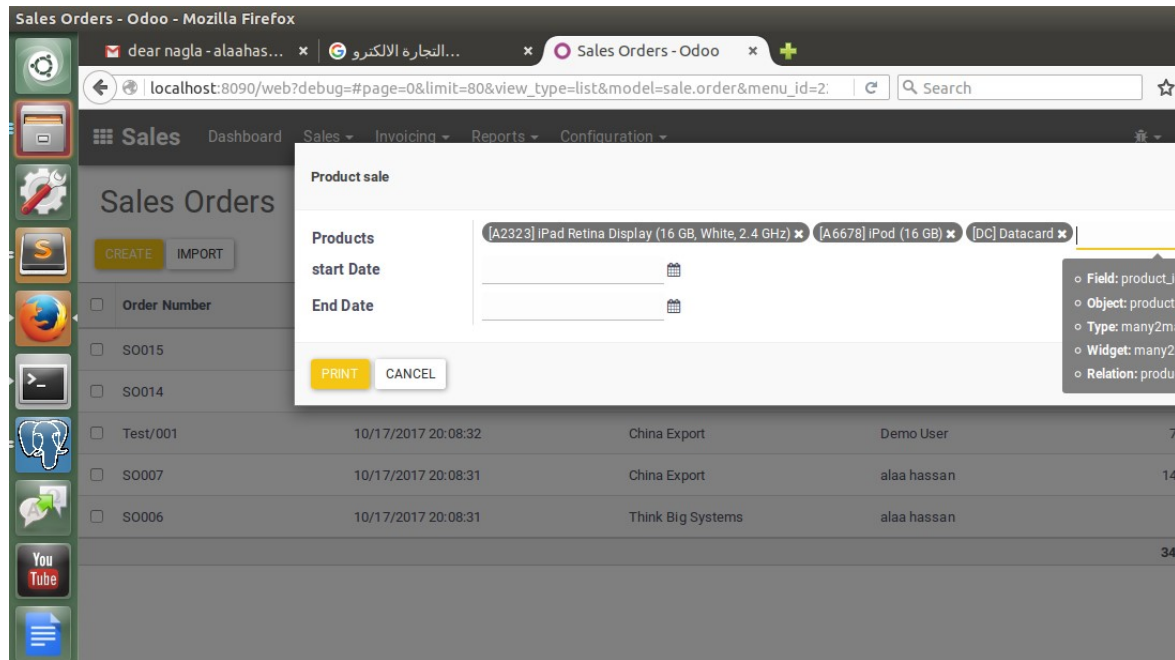


Figure 5.27: Vendors report if only specify products

The system show all products that the vendors select from the first date of sales to the date of the requesting for the report as shown in figure 2.28:

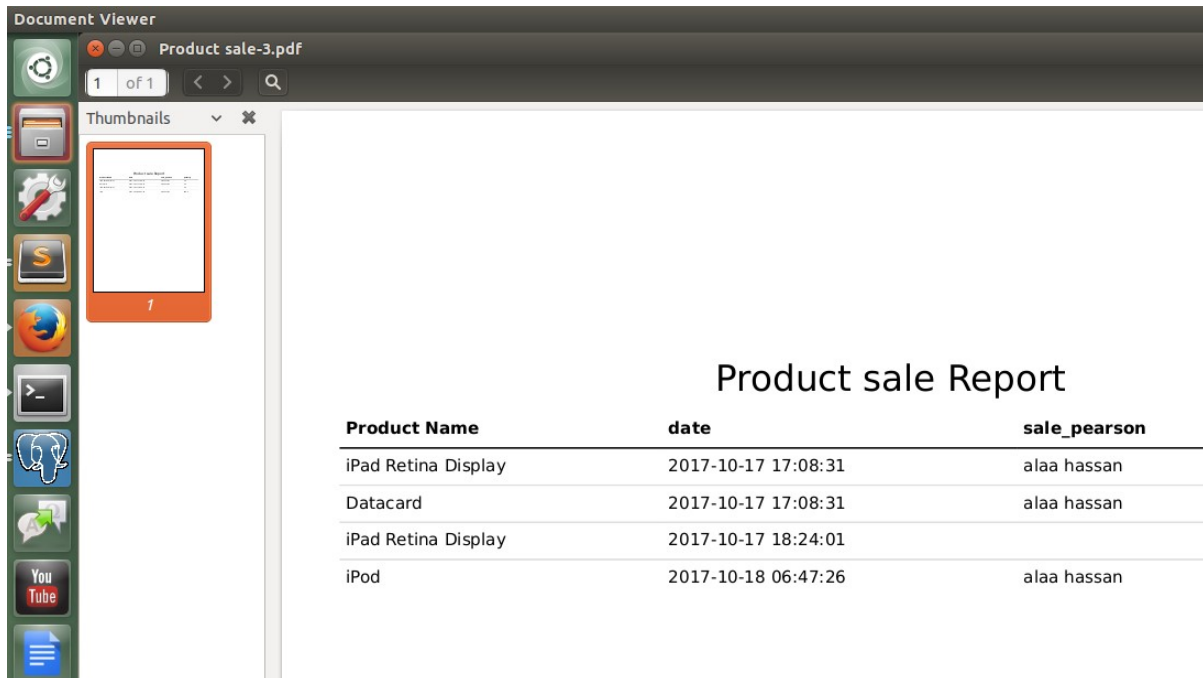


Figure 2.28: Show these products from the first date of sales to the date of the requesting for the report

If he did not specify product and did not determine rang of date as shown in figure 5.29:

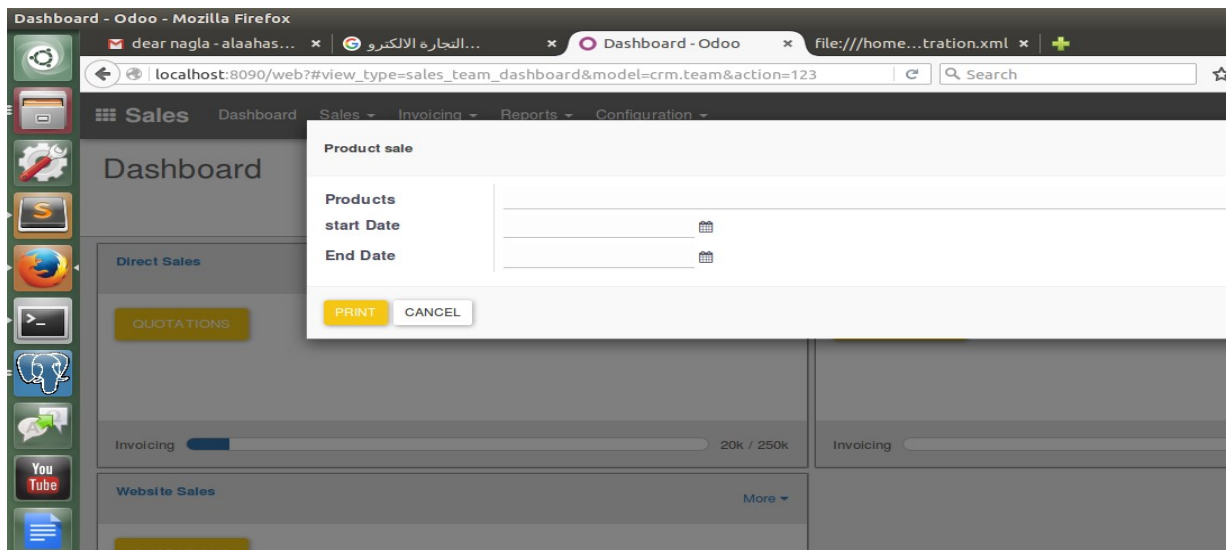


Figure 5.29: Vendors do not specify product and do not determine range

The system shows all products from the first date of sales to the date of the requesting for the report as shown in figure 5.30:

Product Name	date	sale_pearson	quantity
Laptop E5023	2017-09-17 17:08:00	Demo User	3.0
Pen drive, SP-4	2017-09-17 17:08:00	Demo User	5.0
Headset USB	2017-09-17 17:08:00	Demo User	2.0
GAP Analysis Service	2017-09-17 17:08:00	alaa hassan	24.0
Support Services	2017-09-17 17:08:00	alaa hassan	30.0
External Hard disk	2017-09-17 17:08:00	Demo User	1.0
Blank DVD-RW	2017-09-17 17:08:00	Demo User	3.0
Printer, All-in-one	2017-09-17 17:08:00	Demo User	1.0
Laptop E5023	2017-09-17 17:09:00	alaa hassan	3.0
Pen drive, SP-4	2017-09-17 17:09:00	alaa hassan	5.0
Headset USB	2017-09-17 17:09:00	alaa hassan	2.0
GAP Analysis Service	2017-09-17 17:09:00	alaa hassan	24.0
Support Services	2017-09-17 17:09:00	alaa hassan	30.0
GAP Analysis Service	2017-10-17 17:08:29	alaa hassan	10.0
Toner Cartridge	2017-10-17 17:08:29	alaa hassan	1.0
GAP Analysis Service	2017-10-17 17:08:29	alaa hassan	16.0
Webcam	2017-10-17 17:08:29	alaa hassan	10.0

Figure 5.30: All products to the date of the requesting for the report

5.4.2 Customers

5.4.2.1 Sign up

We add additional information in the customer registration form (phone, PAN) some of this information is necessary to complete the process of payment as shown in figure 5.31:

Sign up login | Website localhost - Mozilla Firefox

localhost:8090/web/signup

odoo Home Shop Vendors Contact us Administrator -

Your Email

Your Name
 e.g. John Doe

Password

Confirm Password

phone

PAN

Sign up Log in with Google Back to Login
 Log in with Odoo.com

Figure 5.31: Sign up as customer

The customer billing the information to make an account as shown in figure 5.32:

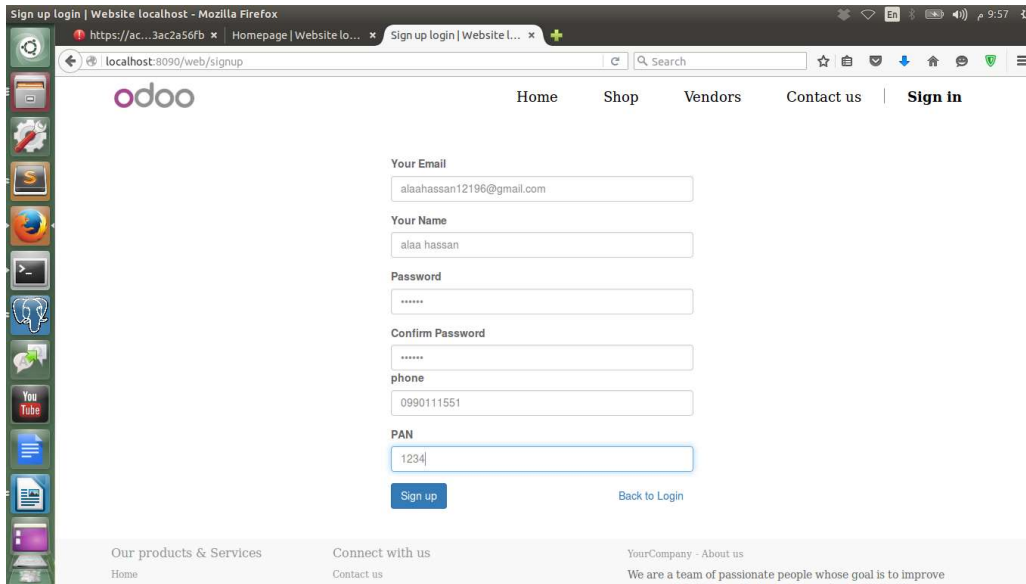


Figure 5.32: Billing information

5.4.2.2 Purchase Process

The customer enters the shop and searches for product by name or by price as shown in figure 5.33:

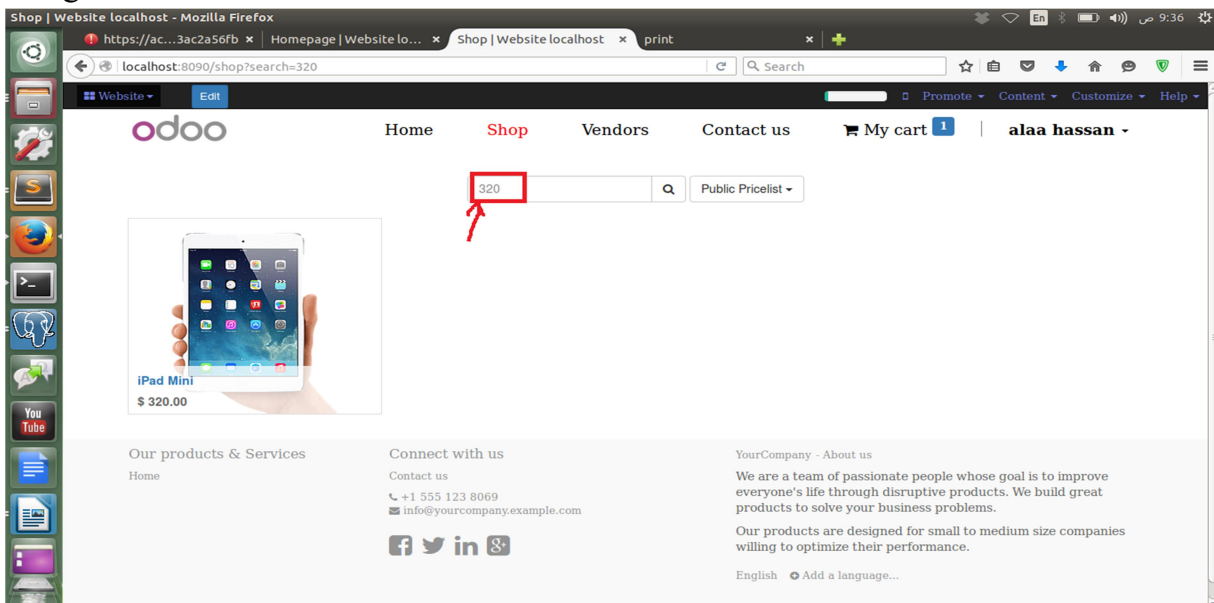


Figure 5.33: Search product by price

After he found the products which he wants, add it to the cart as shown in figure 5.34:

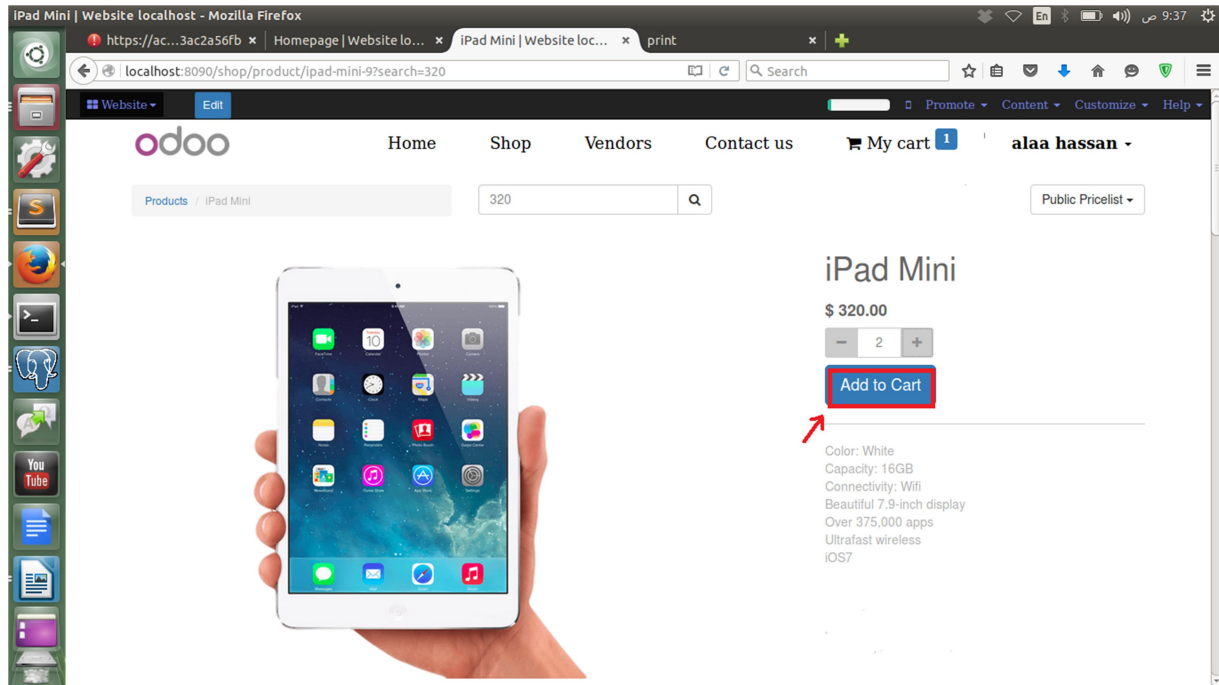


Figure 5.34: Add product to cart

After that, he selects the quantity which he needs to buy as shown in figure 5.35:

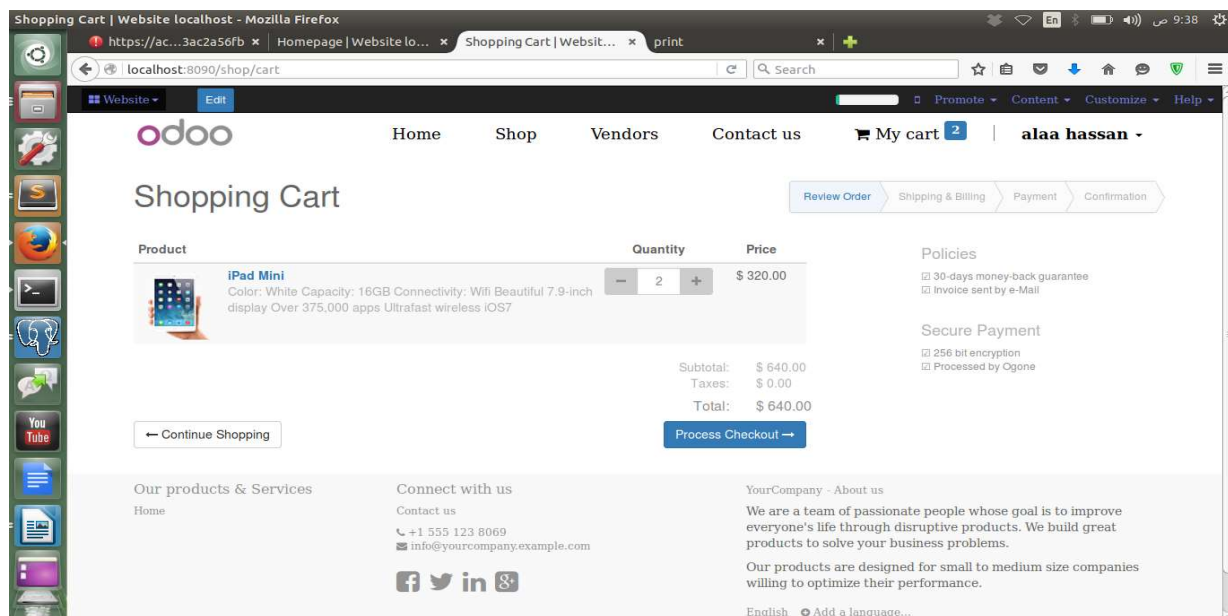


Figure 5.35: Select quantity

After he goes to the checkout process the customer data retrieved to the checkout form, and we add additional field that requires in payment process (PIN number) as shown in figure 5.36:

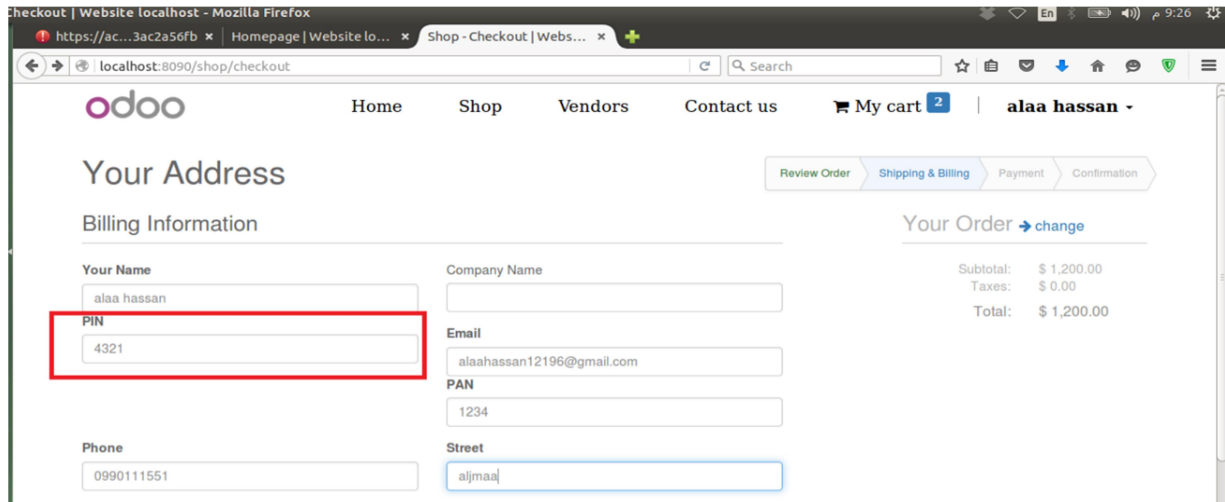


Figure 5.36: Enter PIN

5.4.2.3 Online Payment

5.4.2.3.1 Add new payment method

To add our payment method and reveal it on the website we do configuration below:

Accounting => Configuration => payments => payment Acquirers

Then we create our new online payment method as shown in figure 5.37:

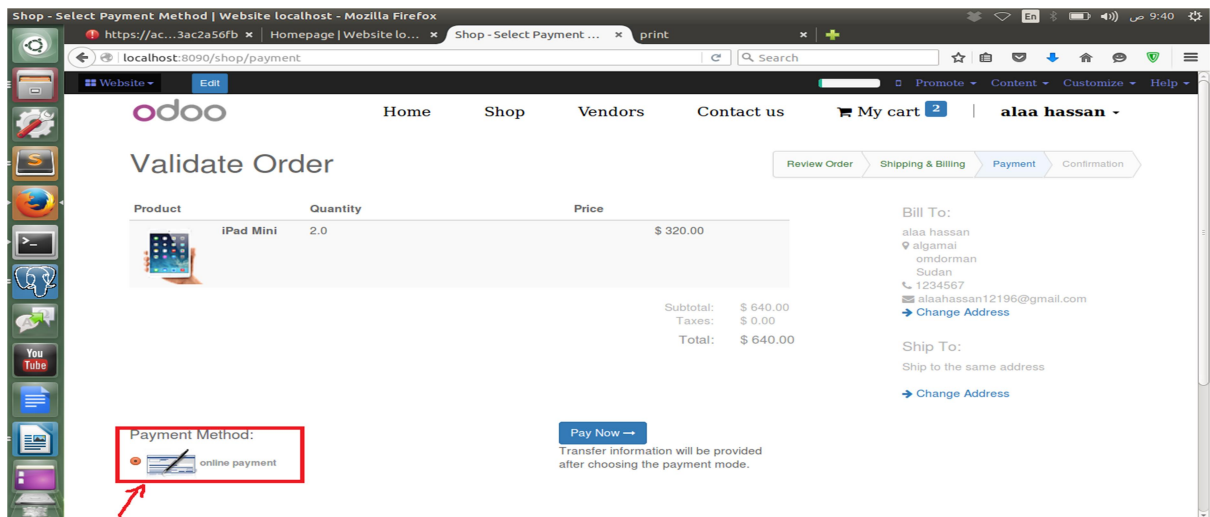


Figure 5.37: Payment method

5.4.2.3.2 Payment Process

When the customer chooses the online payment method, then click on *pay now* button as shown in figure 5.38 to take this information and send a request to payment web services that take customer IPIN and PAN to do the process of payment that includes (checking his balance to ensure if it is enough to buy, transferring money from customer account to our website account) then receive a response from payment web services.

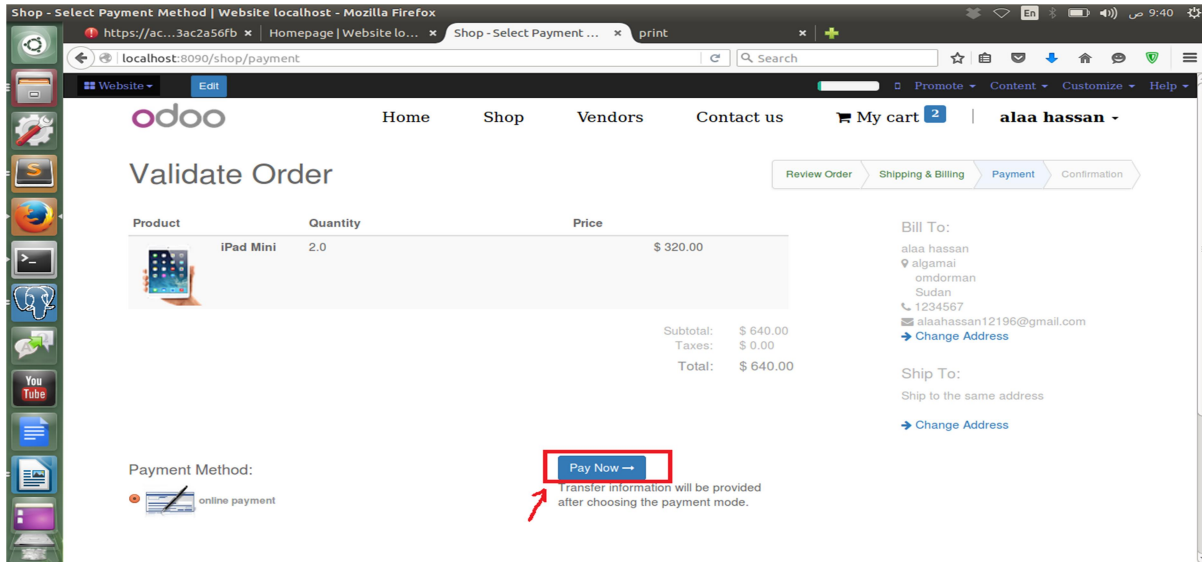


Figure 5.38: Payment process

If a customer receives successful response . The system automatically creates invoice and sale order as shown in figure 5.38. Otherwise, the system shows message to customer tells him that the purchasing process did not complete as shown in figure 5.39:

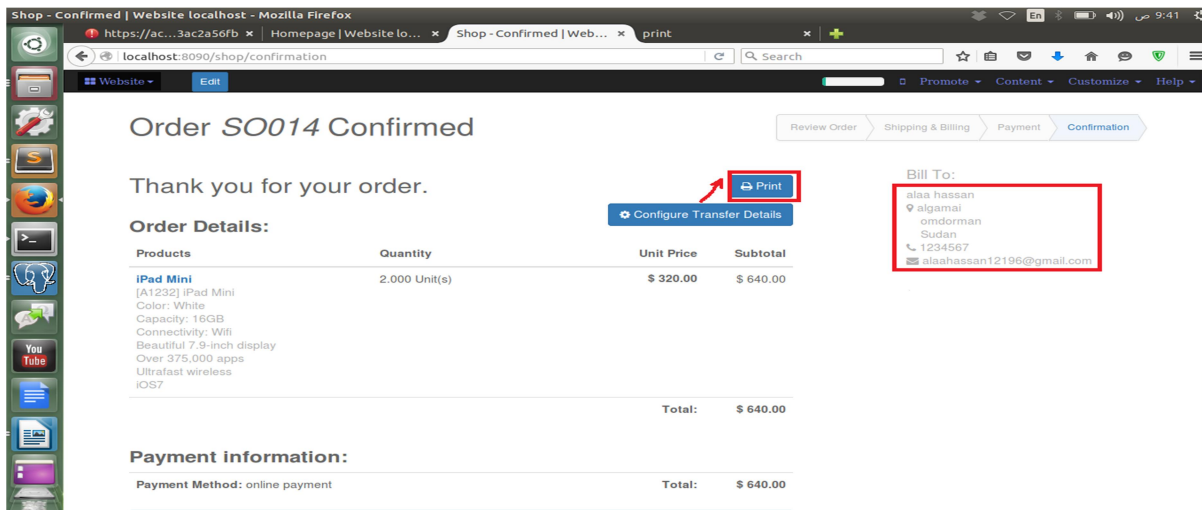


Figure 5.39: Customer invoice



Figure 5.40: Print customer invoice

5.4.2.3.3 Reconciliation process

After the process of payment completed successfully, the reconciliation web service is invoked and the money transfer from the website account to vendors accounts who the customer bought from them specific products.

5.5 Administrator

5.5.1 vendor registration report

The system provides the administrator the ability to show all vendors who registered in the system as shown in figure 5.41:

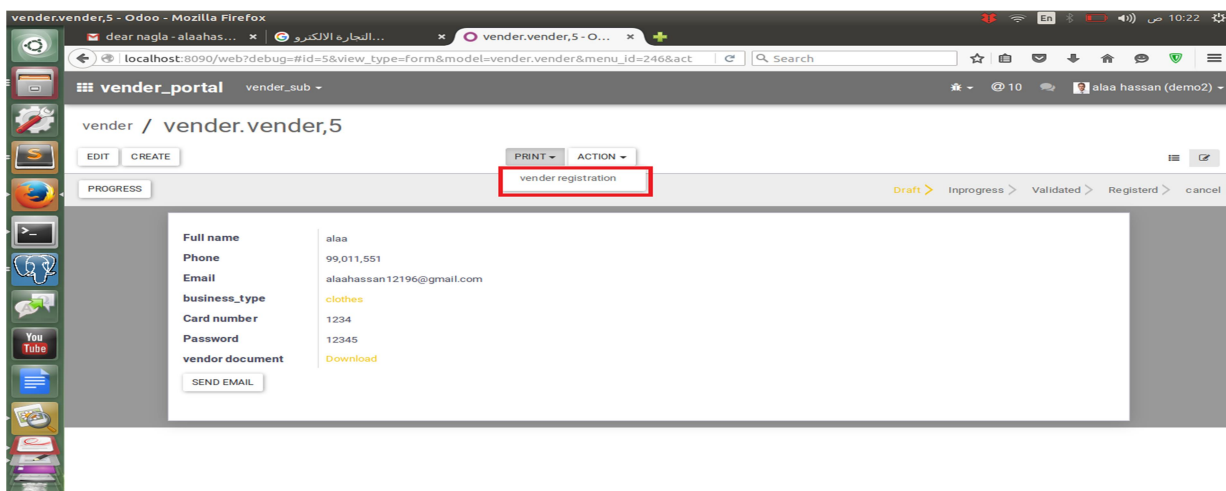


Figure 5.41: Show all vendors who registered

We created PDF report to show the details of vendors who are registered as shown in figure 5.42:



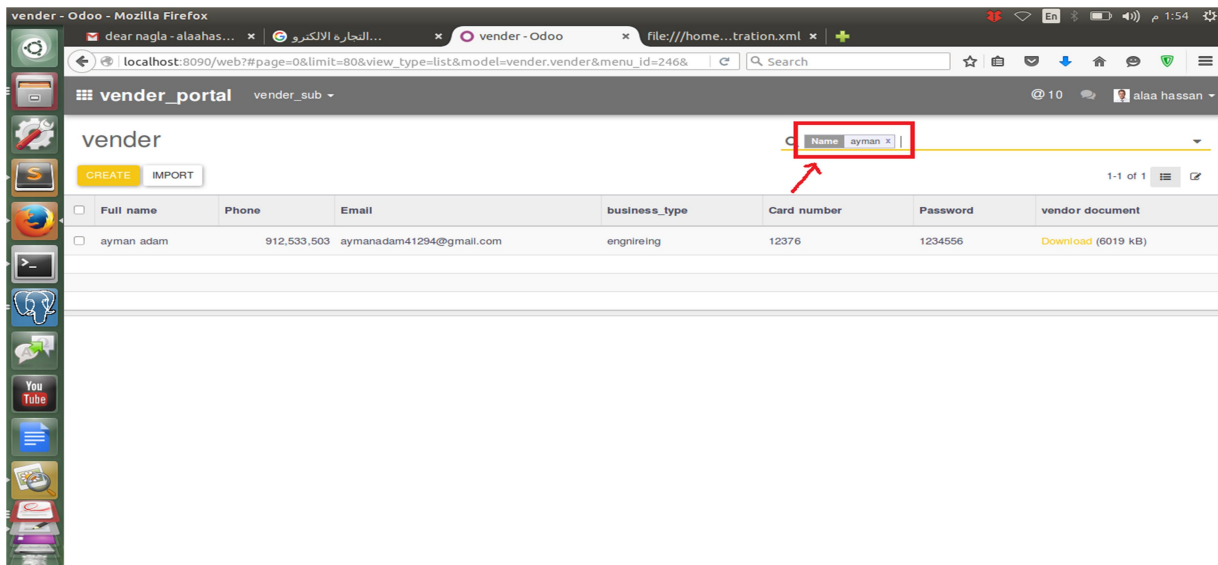
The screenshot shows a PDF viewer displaying a report titled "Vendor registration report". The report contains a table with the following data:

vendor Name	phone	Email	Bisnuss type
Mohammed Ahmed Ali El-omarabi	0993669011	mohammedElomarabi@gmail.com	"clothes"
alaa hassan	0990111551	alaahassan12196@gmail.com	"accesseres"
ayman adam	0912533503	aymanAdam41294@gmail.com	"engniring tool"

Figure 5.42: Show all vendors who registered as report

5.5.2 Search for vendors

The administrator has the ability to search for a vendor by his name as shown in figure 5.43:



The screenshot shows the Odoo vendor portal interface. A search bar is visible with the text "Name ayman x" entered. Below the search bar, a table displays the following vendor information:

	Full name	Phone	Email	business_type	Card number	Password	vendor document
<input type="checkbox"/>	ayman adam	912,533,503	aymanadam41294@gmail.com	engniring	12376	1234556	Download (6019 kB)

Figure 5.43: Search for vendor by his name

Also he can search for a vendor by his business type as shown in figure 5.44:

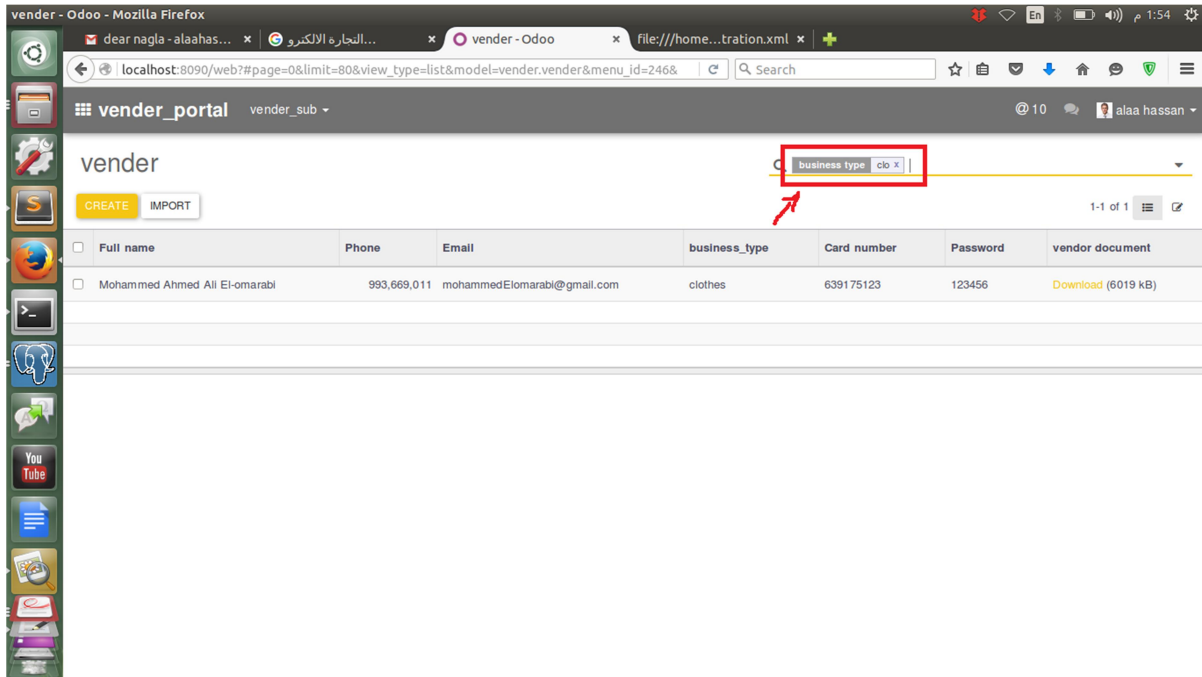


Figure 5.44: Search for vendor by his business type

also, he can filtering the vendors according to their business types as shown in figure 5.45:

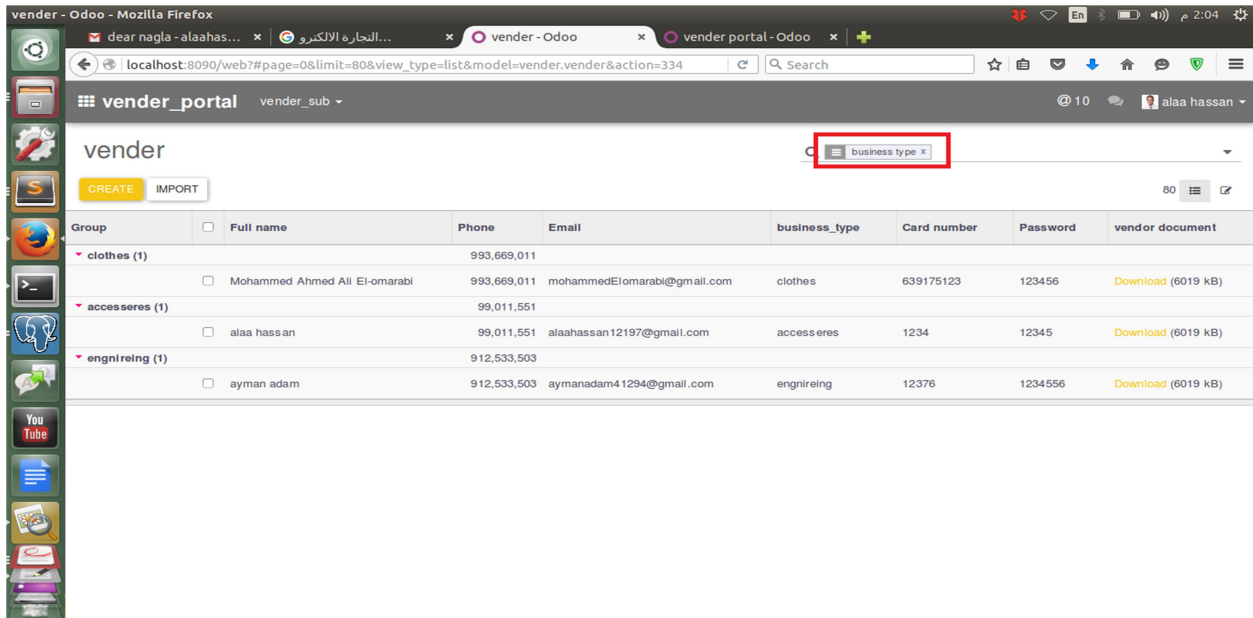


Figure 5.45: Filtering the vendor according to business type

5.5.3 translate vendor portal into Arabic as shown in figure 5.46 and 5.47:

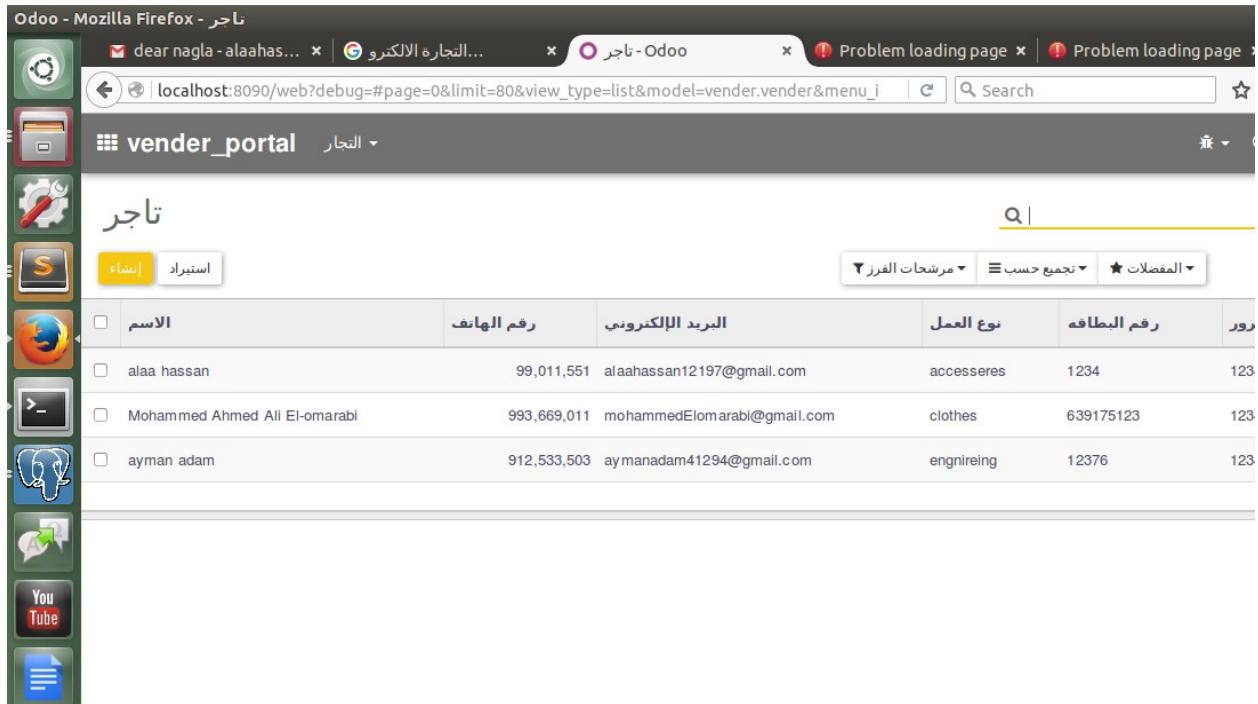


Figure 5.46: Vendor portal in Arabic(1)

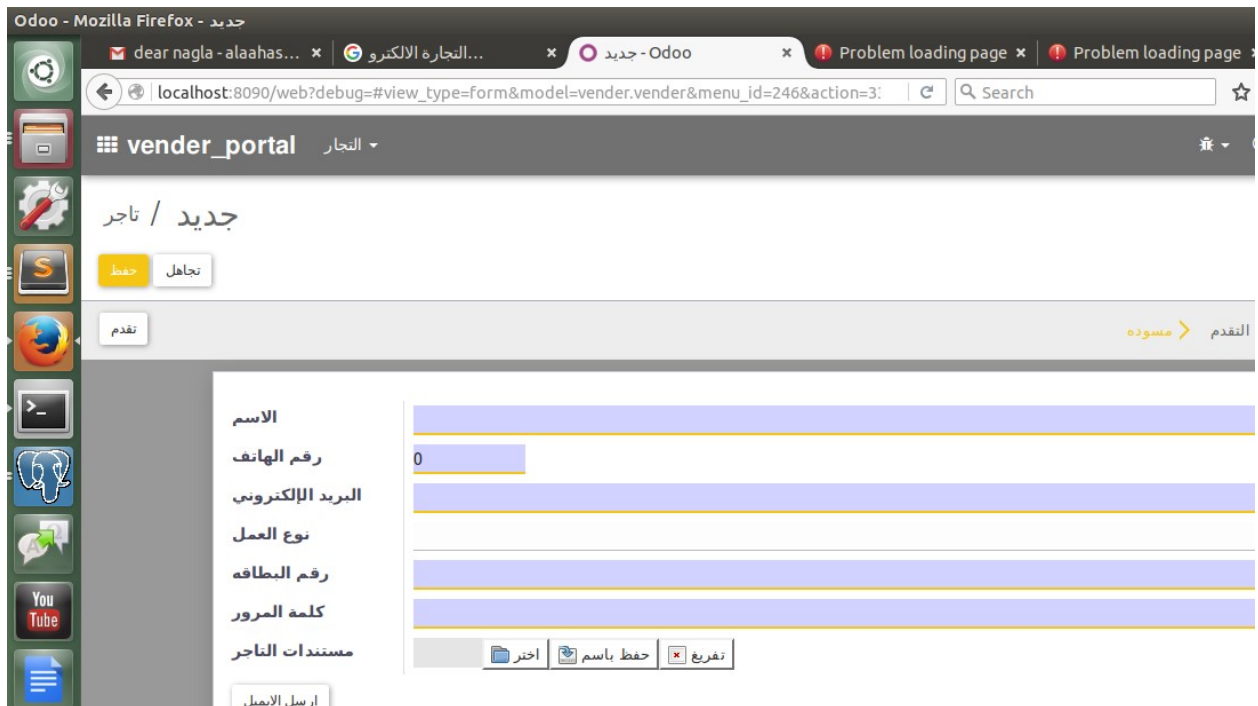


Figure 5.47: Vendor portal in Arabic(2)

CHAPTER SIX
CONCLUSION AND
RECOMMENDATIONS

6.1 Introduction

This chapter presents the results of this research and the work that we recommend to be done later.

6.2 Result

- Handle the process of electronic payment in Sudan.
- Ability of organizing vendor business by providing ERP solution to him (inventory integrated with sale, purchase and accounting module).
- Ability to provide a reports to vendors that show the products that bought in specific period.
- Do not waste time searching for the desired product and the buyer can pass through more than one gallery in a few moments.
- Product from different companies are displayed with each other leading to
- Multiple options: where the buyer finds himself in front of more than one form and brand of the same commodity that he wants at varying price, which enables him to trade.

6.3 Recommendations

- Integrate with delivery channel.
- Handel the issue of security during the process of invoking payment web service.
- Using electronic money to purchase a product
- Provide full ERP solution for vender according to their requirement.
- Optimize show of category in an e-commerce website.
- Optimize search of product (search by Product Company, category and variant).
- Integrate with the traders office to facilitate the process verifying about the vendors

CHAPTER SEVEN
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