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Diploma Thesis

E-commerce and E-business - The Online selling system of Georgian Wine

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Statutory declaration

I declare that I have worked on my diploma thesis titled “E-commerce and E-business - The Online selling system of Georgian Wine “ by myself and I used only the sources mentioned at the end of the thesis.

In Prague November 20,2012

Guram Keleptrishvili

Acknowledgement

I would like to thank doc. Ing. Mansoor Maitah, Ph.D. et Ph.D., Ing. Miloš Ulman, Ph.D. and others for their advice and support during my work on this thesis.

Internetový obchod - Internetový prodej vína v gruzii

E-commerce and E-business - The Online selling system of Georgian Wine

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Souhrn

Cílem diplomové práce je ukázat význam e-business a e-commerce v rozvojových zemích. E-commerce může být velmi efektivní pro malé a střední podniky. Je prokázány výhody a přínosy e-commerce. Hlavní přínosy jsou: nízké náklady, objednání zboží ,online služby a online platby. Hlavním cílem práce je ukázat výhody gruzínského vína. Proč máme třeba investovat a zpřístupnit online vinárnu, která nebude ani záviset pouze na gruzínský trh, nebude také žádná hranice kde může být prodány vína, samozřejmě to zvýšit obchodní zisk.

Diplomova práce je rozdělena na 2 částí. První část je diskuse a obecná definice e-commerce a e podnikání. Existují příklady e-commerce v Gruzii. Druhá část obsahuje praktická řešení. Praktická část je rozdělena do 2 částí. První z nich je strojírnoství on-line prodejní systém gruzínského vína, který je vytvořen pomocí UML nástrojů. Poslední část je statistický výzkum, který nám ukazuje názor českých občanů o gruzínského vína. Respondenti jsou z různých EU a mimo EU zemí, kteří jsou českými rezidenty. Také tam jsou statistické průzkumy, co gruzínské výrobci vína přemýšlet o tom, on-line prodejní systém. Jaké jsou jejich názor o prodeji vína on-line. Také to, co potenciální zákazníci myslí o gruzínského vína.

klíčová slova:

E-business, E-commerce, Gruzie, gruzínský vína, online obchod, e trh

Summary

The aim of diploma thesis is to show importance of e-business and e-commerce in developing countries. E-commerce can be very effective for small and middle businesses. There is proved the advantages and benefits of e-commerce. The main benefits are: low costs, ordering goods and services online, online payments. The main aim of thesis is to show advantages of Georgian wine. Why do we need to invest and make online wine shop, which will not be depended only for Georgian market, also there will be no borders where can be sold wines, of course this will increase business profit.

The diploma thesis is divided by 2 parts. The first part is discussion and general definition of e-commerce and e-business. There are examples of e-commerce in Georgia. The second part contains practical solutions. The practical part is divided by 2 parts. The first one is engineering of online selling system of Georgian wine, which is created using UML tools. The last part is statistical research, which show us the opinion of Czech residents about Georgian wine. Respondents are from different EU and non-EU countries, who are Czech residents. Also there are statistical research, what Georgian wine producers think about online selling system. What are their opinion about selling wine online. Also what potential customers think about Georgian wine.

Keywords

E-business, E-commerce, Georgia, Georgian wine, online trade, e-market.

1. Introduction

In modern era all countries try to use all positive opportunities, which has internet. Developing countries are more involved in this, than developed countries. The reason is that these countries are not so developed in terms of information-technology infrastructure. Using the cost saving which is offered by Internet technology, these countries can skip some development stages in technological point of view. Developing countries are more near the edge of technology development and have huge potential to enter inside easily. The most developed country in e-commerce is United States; they have really good benefit from it. In many poor countries, internet technologies are not developed and it will take a long time to get benefit from e-commerce. Company will get benefit from e-commerce if there will be demand of some product which can be traded on internet. It will decrease the costs.

There are opinions, that e-commerce can be used only for that products and services, which can be exported, but it is not correct approach. We can also reduce the costs of imports using e-commerce. If country is not going to export something, it is possible to import services such as long-distance learning, architectural and medical consultations. In our case, Georgia is the famous wine making country and also has different products, which can be exported. When company has above mentioned services, it is not necessary to open office in foreign country, using internet technologies; it's possible to make it online.

During the enormous developing growth of the information systems, businesses entering the Internet arena to find models that works for better performance of enterprise on the market. Online sales grow rapidly for such products as books and music CDs, also different kind of electric appliances, but still people's trust about online shopping and online money payments with bank cards are not on high level. Of course for companies online transactions decrease different kind of taxes and increase profit. Time Warner which is one of the world's largest

media companies was the largest merger in history which shows the enormous growth of Internet business!

Nowadays, information and communication technology (ICT) is becoming more and more prevalent in many businesses. In the past, information systems had some specific functionality. Nowadays, different information technology departments can integrate into each other, it means that one company system can be integrated not only within the company, also across company borders. Information systems changed business planning. IT departments have huge role in companies, maybe in the future this department will be number one department. Of course in case of e-business we need correct management. Company must create software to fulfill not only their requirements in own company but in other companies too.

Internet can give savings to companies. For example e-business and e-commerce are very important for developing country such as Georgia. Many Georgian companies still don't use new Internet technologies to increase sales. In rural area, there are huge problems, there is no internet. Many Georgian peasants who live in villages don't know how to promote and sale their product. They still use old fashioned methods. Using internet technologies they can increase their profit and make online advertisement of their product. There are many Georgian wine makers who don't know how to sell their wine. They need new markets, where they will sell wine. The main aim of this thesis is to help wine makers to make online selling systems and to search new global markets, which will have no border. In another case, it will be very easy for customers to buy product and to pay easily using credit card or another online payment systems such as PayPal. In this diploma thesis we will discuss about online wine selling system. There will be some statistical research how important is for Georgia to sell wine online in foreign countries.

2. Objectives and Methodology

The aim of my diploma thesis is to create system which will help Georgian wine companies to sell wine online. There are analysis of current state of e-commerce and its use in Georgia. We identify the obstacles and opportunities for companies in doing business online. Also I analyze and design e-commerce solution to support Georgian wine export in abroad. There are discussion how important is e-business and e-commerce for developing countries. There are used some software to create information system diagrams. I use SAS software for some statistical research.

I use special methodology for this diploma thesis. I use subject materials and projects from my study course in practical part. It is used some statistical data for research how people think, how important is online selling system. The obstacles and opportunities are identified from secondary data and own questionnaire survey among Georgian wine producers and potential customers. Data is statistically processed and verified by statistical software. The principal processes for e-commerce solution are designed by means of UML methodology. The recommendations for support of Georgian wine export through e-commerce channel is based on theoretical findings, secondary data and outcome of own survey.

3. Literature overview

In thesis are used literature for explaining basic of e-business and e-commerce. It is used topics how important is e-commerce in developing countries [6]. How e-business is developed in Georgia. It is used web sources from Georgia. It is discussed electronic commerce technologies in this thesis.

4 E-business

4.1 General definition of e-business

E-business (electronic business) is the business, which uses global information networks for time saving and increasing profits. E-business helps company to sell and buy different kind of goods and also can collaborate with business partners online. IBM used term “e-business” first time in October, 1997. [1] Today we have different situation, major corporations are using the web technologies for buying parts and supplies from other companies. Electronic business provides web pages for companies and government organizations which can be used as collaboration of two organizations, business process integration and their relation between users who order and customers.

E-business is a revolution in business existence based on new models which are really innovation comparing to old business models and digital processes, where we have hyper growth and new ideals. [2] E-business is a forging of a new economy of just-in-time business models, where physical connection is being changed by virtual operating dynamics. The main advantage of improved internet service is huge amount of customers and clients relationship in real time, which means to use network functions: global network, we can reach all information in global network, interactive regime and decision making process in time. [3]

E-business has some benefits:

- Better accuracy, high quality of delivering information about products and it can be also about services.
- Customers can easily access to web page and see price list of goods or services in unlimited time.
- Easy to choose product and order immediately.
- Increased market size.

- Innovation in electronic delivering of some products and services. It means appearance of new distribution channel. Example of products and services can be software, translated electronic documents, banking, etc.
- Attract more customers. Increase export opportunities.
- Decrease of administrative tasks. Improving strategic thinking.

4.2 Is e-commerce same or similar to e-business?

E-commerce refers to online transactions - buying and selling of goods and/or services over the Internet. [4]

As Brian C. Satterlee [5] says in his book e-commerce is defined as any transaction over the internet involving transfer of goods, services or information, or it can be any intermediary function that helps enable those transactions.

When we use words e-commerce and e-business, they are different concepts. In e-commerce, information and communications technology is used in global business or global organizational transactions (organizations make transactions between each other) and in business-to-consumer transactions (in this case transactions process between organizations and customer). In e-business, ICT is used to extend one's business. One of the best definitions of e-business is: "The transformation of an organization's processes to deliver additional customer value through the application of technologies, philosophies and computing paradigm of the new economy." [6]

There are three primary processes in e-business:

1. **Process of production**, this process includes ordering, procurement and replenishment of stocks; payment process; electronic links with suppliers; also control of production among other organizations or companies.

2. **Customer-focused processes**, this is process which is connected to costumers: promotion and marketing, selling via internet, which contain payments and purchase order. The customer support online.

3. **Internal processes** - contains employee management services. For example: training, information-sharing, video-conferencing, and recruiting. Electronic applications help enterprises to improve sales force productivity. More efficient is to publish internal business information for workgroup.

4.3 Developing of e-business in Georgia

As you know Georgia is developing country from Eastern Europe. This country had many wars along lifecycle. Silk Road crossed Georgian territory, so it was important place for many businessmen. Nowadays Georgia develops very fast. There are many innovations in information systems. E-government is on a high level. More and more companies appearing which sell product online, but there is still problems in payments. Only one bank provides online payments via different kind of cards: Visa, MasterCard, Maestro, etc. Many companies introduce new technologies for their business growth.

There are very famous payment systems like pay boxes in Georgia. You can charge your mobile account, pay bills for electricity, Gas and water.

Picture 1: TBC Bank pay boxes



Source: www.tbcpay.ge

These machines have touch screen menu. It is possible to choose categories, where you can find information about company services. Need to choose money amount, computer automatically counts, how much money is inserted in the machine.

Picture 2: OSMP Pay box touch screen menu. (In Georgian Language)



Source: www.gadaixade.ge (online payment system)

Online customer always chooses business service, which has one general direction of development. For e-business and e-commerce, promotion and advertising strategy is very important. Information news about high level of quality of product must be renewed frequently. Also there must be a balance between product and price, customer needs to have guaranty that he will receive that product which is given on web site.

There are some strategies for companies, how they can attract online customers:

- To offer sales on products, during some period of time.
- To offer experimental product for potential customers, so that they can be convinced in high quality and good price of product.
- Discussion about some kind of product and share this information among customers. It can be information hotline or forums.
- The correct strategy of online promotion planning.
- High quality of products distribution. Customers must receive their ordered product in time.

Nowadays, as we mentioned above, one of the strategic action in e-business planning is internet promotion and advertising. There are many possibilities for making online promotion of products: social networks, internet forums and blogs. E-marketing is one of the important factors for developing e-business.

Georgian wine companies have great perspectives to change their strategy and create system which will be helpful to sell wine online. Georgian wine is well known in many countries. The mixture of e-business and e-marketing will increase profit for companies.

4.4 General definition of e-marketing

Internet marketing is defined as the usage of the Internet and digital technologies for achieving marketing objectives. These technologies can be different kind of digital media: cable, wireless and satellite media. Practically e-marketing uses company web site features such as search engines, banners and direct links from other web pages to attract new customers and provide high level of service for existing customers. This type of process is called online techniques of promotion. [7]

The Internet has different kind of tools which can be offered to the marketer:

- Distribution can be done via internet, like Amazon.com does.
- For maintaining and building relationship between company and customers can be used internet. As example we can take Dell.com.
- Company can collect money via internet transactions. Customers order online some good and pay via bank cards.
- Attracted potential customers can register online in a very short periods of time. It means that they are becoming company customers without any paper based documents, decreasing bureaucracy.
- The Internet can be used for promotion and advertising. As example we can take “Google Adwords”.
- Direct responses can be collected via web.

One of the well known kinds of e-marketing is email. Nowadays about 4.3 billion email accounts are active in the world and this number will rise to 5.6 billion by 2016. (The Radicati Group Email Statistic Report, 2012) [8] Companies send emails to registered customers about new products or services. For attracting new customers emails are sent to random email users.

Figure 1: Worldwide Active Emails Accounts in Millions. [8]

	2012	2013	2014	2015	2016
Worldwide Email Clients (M)	4,366	4,657	4,963	5,274	5,591
Worldwide Email Users (M)	2,172	2,317	2,463	2,611	2,761
Average Clients/Users	2.01	2.01	2.02	2.02	2.03

Source: The Radicati Group Email Statistic Report, 2012 [8]

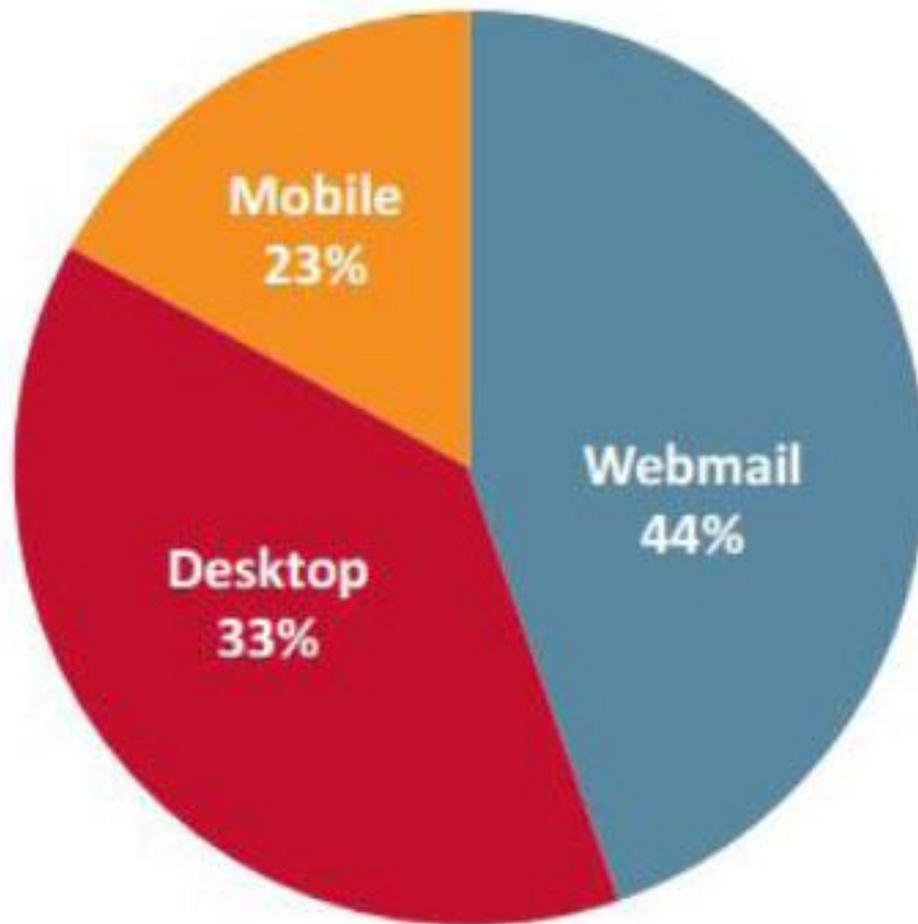
The benefits of E-Marketing are:

- High speed: messages are delivered straight to the customers emails.
- Penetration: Easy to reach in every geographical area. Company employers don't need to travel; they can just do it online.

- **Easy to use and Efficiency:** with one click of the mouse you can send huge amount of emails to customers.
- **Low Cost:** No need of huge capital. It's cheap to set up system.
- **Targeted:** It is possible to divide recipient groups and work with them as it will be better for the company.

It is interested where people can see these emails. There are three possibilities, where email is read: desktop, mobile and webmail. We can see percentages on pie chart.

Figure 2: Where email is read. [9]



Source: Internet Statistics Compendium, 2012

5. E-commerce

5.1 History of e-commerce

About 40 years ago the term e-commerce was used to explain business online transactions technologies: Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT). These two technologies started their functioning in the end of 1970. This time started exchange of business transactions between companies. The process was same like typical electronic purchase and invoices. EDI and EFT were groundwork of that system what we call now e-commerce. One of the examples of e-commerce was the Boston Computer Exchange, which started in 1982. The next evolution of e-commerce was ATM machines and telephone banking. Enterprise Resource planning (ERP) appeared in the end of 1990. [10]

The real secured protocols and internet with high speed DSL appeared after 1994, which allowed faster online transactions. This system was the same what we call now e-commerce. From 1998 to 2000 Western European countries and US created simple e-commerce websites. [11]

E-commerce changed its definition when many online businesses were folded in 2000. This collapse was bad for companies but many businesses were emboldened with e-commerce promises. In 2001 B2B transactions became the biggest forms of electronic commerce with about \$700 billion dollars in sales.

When two well known huge e-commerce companies such as Amazon and eBay were established, they were leaders on the market. They were launched in 1994. Both of them were built to be a brand companies. The famous products of which these companies sell are music, books, computers and different kind of electronic appliances.

5.2 Definition of e-commerce

Electronic commerce is a new concept in business. E-commerce is internet technology, which helps organizations to achieve their goals. Internet networks are used for improving organizational performance. It means that companies increasing customer service quality. This technology is perfect for both sides, for organizations and for customers. Electronic commerce is not only ordering process of goods from web site online catalog. It is relationship of two parts. Companies can have straight connection to each other via internet. There can be online transactions between them. E-commerce has some activities to support investor relations based on web site. Information technologies are used for transactions and communications between organization's stakeholders. Such stakeholders can be suppliers, employee, government and etc. [12]

In the beginning e-commerce required some kind of security certificate and expensive interface, but nowadays there is no need of having such expensive documents and technology. Hosting servers are used for successful websites of e-commerce and it's not necessary to have individual merchant for redesigning wheels. In this case this system has benefits. One of the best benefits is secure credit card payments.

There are some other benefits for E-commerce: [13]

- Low costs: reduced labour, reduced bureaucracy, reduced errors in typing data on the paper. It means to make mistakes in paper based documents. If you are client it's also money saving for you. You don't need to go out and spend money for transportation. You will receive your ordered product where you want.
- Reduced Time: Less time you need to buy some product via e-shop, without going out from the office or home. Product delivery time is up to customer. He or she can choose any time of delivery and they will receive this product in time. Also it's possible to choose place, where you want to get this product. From the company side, it's really time saving, you can receive large amount of orders together. For example in 10

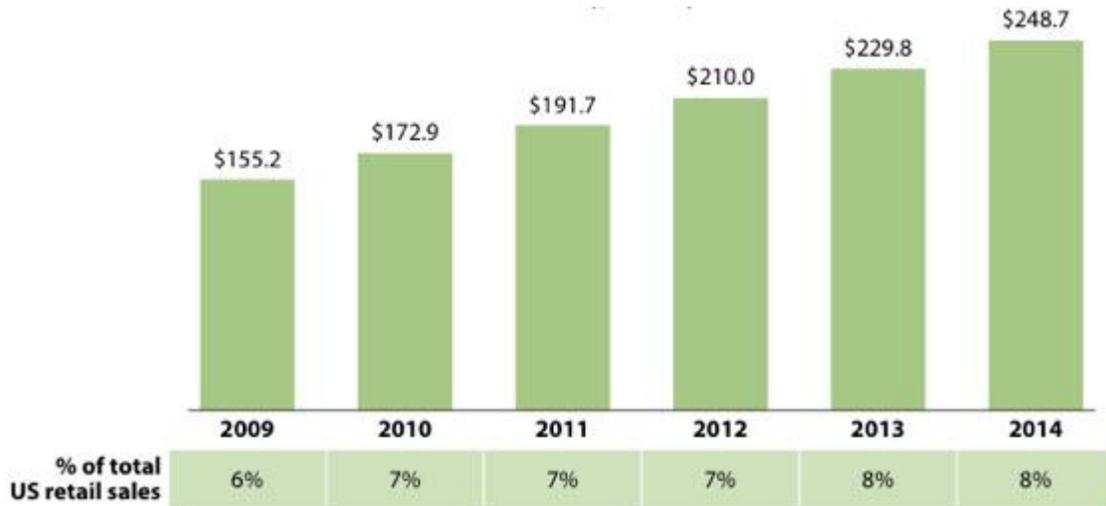
minutes you can receive 200 orders, which is impossible without e-commerce system, without internet.

- Flexibility: It's easy to manage complex situations, online user's profiles and also product ranges, before they will become unmanageable.
- Long-term relationship with your partners: Better relationship between partners in trading. Also good perspectives for long-term relationship.
- Lock in online customers: when you have good relationship with your customers and you do the best for them, it means that it is allowed to change standard business practice with the e-commerce practice. For competitor companies it will be difficult to spoil relationship with your customer.
- E-commerce creates new Markets: Business can be expanding geographically wider, if using internet technologies. Internet has the potential to expand your business into wider geographical locations. The important thing is to develop distribution channels and production for supporting market needs. Good promotion will increase amount of customers from huge marketplace.

5.2.1 Advantages of e-commerce

Nowadays e-commerce is very popular on the web. From Forrester [14] prognosis we know that online retail sales will be \$250 billion by 2014. From this stat we can see how profitable e-commerce is. Many benefits can be offered to customers via online shop.

Figure 3: Forecast of US online retail sales 2009 to 2014 [14]



Source: Forrester Forecast 2009 to 2014

In spite of all this superiority of e-commerce, it has some disadvantages. At first let's discuss about advantages more deeply.

Advantages of e-Commerce are: [15]

- **Work Hours: 24/7.** Online store is opened 24/7. So it means all customers can visit anytime to your web site and place orders.
- **Niche Products** – It is possible to sell online anything you want. It can be possible so that your product is targeted to a small market, but somebody will find and will buy it.
- **Cheap Transaction Costs** – It is possible to automate online shop so that you could cut the costs in phone calls and working stuff costs. It's very easy to detect errors and correct them maybe without payment.
- **Adroit shopping online** – Customers have perspectives if they use online store:

1. It is not necessary to visit shop. It is possible to search any kind of product online lying on bed.
 2. Customers save time and fuel
 3. Customers can search huge amount of products in few time.
 4. Comparison of prices is very easy.
 5. Customer can easily choose different kind of payments
 6. Important information could be provide by customers more securely
 7. All these above mentioned stuff can be done on the go
 8. There can be better deals for certain products.
- Cross sales – Big markets have this feature. As example we can take Amazon.com. When customers searching some products and viewing them, they can see who bought this product. So psychologically they will buy this product too, if there is huge amount of purchases on this product.
 - Better relationship with customers - Visitors who visit your web site is good. Same visitors who visit your site again are better, but visitors who visit again and buying some products from your online shop are users you want. They can develop and plan better marketing strategies for your business and your online shop. The best easier way to do all above mentioned are:
 1. One of the best promotions of online store can be to create buzz in social networks. It's free to register for these social networks, but you pay cheep amount of money for advertising your business.
 2. It is possible to make blog where all customers can view news about new products, good deals and etc.
 3. To make comment field for products is one of the best way to interact with customers, but of course product quality and service must be on high level. If there will be everything not perfect, customer will write bad comment for product and it is anti advertise of course.
 4. Online advertises helps your business to attract more customers.

5. Making discounts on different kind of products will cause on converting visitors into customers. Of course I will be right decision and the best marketing strategy.
- Recording of transactions – If you want to have good business, it means to have good transactions recording. It's very easy to automate this feature on your online shop. It's not necessary to hire person who will do this job. System will automatically save all information about customer activities in online shop. This data can be used for analyzing business process.

5.2.2 Disadvantages of e-commerce

Disadvantages of e-commerce are: [16]

- Time for shipping – In case of physical products shipping can take some days, sometimes weeks or also months. So we will have problems if we want to send fresh food. To solve this problem, products must be sorted and that products, which are easy to deliver put highlight on online shop. Products which can't be delivered easily, in this case company needs one physical shop, which will have online store for promotion and advertising.
- Shipping is expensive – Shipping cost is depends on the weight of product. If you sell heavy products such as furniture, price of shipping will be very high. Decision is to make contract for best deal with discounts.
- Fears about goods and losing product – Many customers are afraid about shipping goods. They think that it is possible to lose ordered product. Also sometimes they did not relay on the online shops. Sometimes customers suppose that the quality of product will not be same like it's shown on the web page. The solution of this problem can be to convince customer that it is really best service and he/she will be get product which they ordered.
- No possibility to touch product physically – Sometimes this feeling is also annoying for customer. Buyer cannot touch or wear product. Also in many cases online selling

products like furniture or clothes can be tricky. For solution this problem, company just need to write depth description about products.

- Dangerous malicious codes – Online store can be infected with malicious codes. So if web page is not well secured, it can be dangerous for customers too. They can be infected from online shop web page. It's better to pay more and choose reliable server provider.
- Shopping as social process – People like to spent shopping hours with their friends and relax, but online shopping is different of course. this also can be little problems for such kind of people who likes wandering in the huge trade centers. Solution of this problem can be to add some funny and interactive games or news on online store.
- Huge amount of competitors worldwide – It is very easy to create web page and do business. So there can be too many online stores, but you must try to be always best. If you want to have really good online store, you need to have good business plan, marketing strategy and etc.

5.3 Security of e-commerce

Nowadays, online shopping is very popular. It's very easy to buy some kind of product online. As we mentioned above, there are many possibilities to pay online such as PayPal, pay sec and etc. There are some opinions about that online shopping is still dangerous. Sometimes if you are not well skilled in computer, it's possible to use non secured websites, which can steal your money from your bank card. Here we have world statistics, how many college students use online shops to buy products. As we see it depends on country. It's very interesting that in United States 54 % of students buy goods in person, because e-commerce is developed on high level. We can say same about Canada only 26 % of students buy products online. High usage of online shops is in Brazil and in China. If we add these personages, we will get total and it shows that 61 % of college students buy goods in person and only 39 % use online shops. [17]

Figure 4: How many college students buy product online [9]

College Students %	Total (n=1441)	US (n=100)	CAN (n=101)	MEX (n=108)	BRA (n=105)	UK (n=100)	FRA (n=100)	DEU (n=100)	SPA (n=103)	ITA (n=100)	RUS (n=106)	IND (n=113)	CHN (n=102)	JPN (n=101)	AUS (n=104)
Buy more in person than online	61	54	74	75	34	50	76	45	50	54	89	72	40	75	67
Buy more online than in person	39	46	26	25	66	50	24 J	55	50	46	11	28	60	25	33

Source: internet statistics compendium 2012

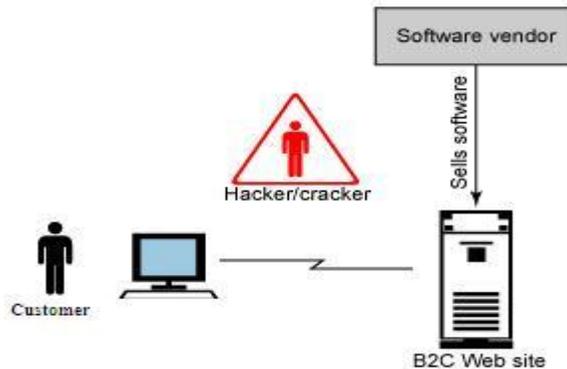
There are two perspectives of security in software industry. System security features are passwords which are guaranteed that they are safe and they must be more than 6 characters long and also encrypted. These features are protection against viruses and hackers attacks. It means that house can have excellent alarm system, but if your door will be left opened, you will be robbed, despite the one of the best security system you have. Security is system process, which must work properly all time.

There are three important concepts in security: availability, confidentiality and integrity. Confidential information can be read only by authorized people. As an example, if someone reads your email it means this person abrogates your privacy. In case of integrity mail must be sent from the person who sends to the person who receives. I someone will add some different file or something will be lost from this mail, it means this person violated integrity of you. . If you have access on your resources and you are authorized, it means you have everything well with availability. If your post is destroyed or post will deliver some month later, it means you don't have availability of your mail.

In e-commerce customer browse website to choose product from catalog and to buy it. There are four players in security of e-commerce. The first player is the customer who uses browser to see website. The owner of this website is the merchant. Merchant is one of the players, who want to sell goods to make a profit. The merchant sells services and goods, but not building software, he pays to other vendors for software to run his website. This software vendor is

third player and the last player is attackers, who want to exploit all other players for gains which are illegitimate. We can see on Picture 3 all these players.

Picture 3: The players of e-commerce



Source: own

The attacker can destroy all resources from the website, also erase important information. These threats and viruses which can be dangerous for website are classified under, integrity, confidentiality and availability. System can be attacked by threat. If your system is attacked, it does not mean that everything is finished and website is demolished. Sometimes there are viruses, which are not so dangerous. System has weakness such as vulnerability, but attacker must not know about it. As example we can say, if you left your house door opened, only you know about it. Vulnerabilities mean some kind of entry in the system. From above mentioned example we can say that for house doors and windows are vulnerable points. In this situation robber can easily enter into house and rob house.

There are some security features of e-commerce system. If we are not sure, that our system is not well secured, we need to build better secure system. There are four categories in security features:

- Authentication: Checking who you are and allow only you to log in your account of internet banking or it can be some different kind of e-commerce website.
- Authorization: Only you can manipulate with your resources. Authorization saves you from increasing balance or deleting bill from your account.

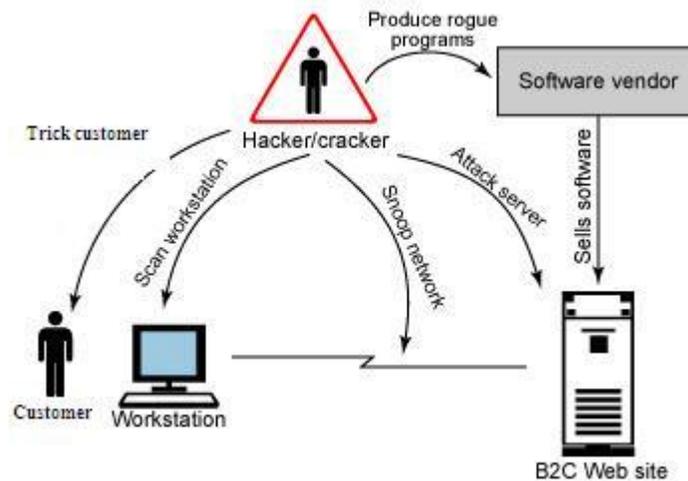
- Encryption: hides some information. This information can be passwords. Encryption saves you from spying, when you use internet banking for transactions.
- Auditing: Saves all operation records of e-commerce. Company uses auditing for proving that you bought some good from website.

5.3.1 Viruses and attacks of e-commerce system

Attacker has different targets. As we mentioned above, there are some entry points in e-commerce which can be attacked:

- Customer
- Customer's computer
- Network connection between customer and company web site's server
- E-commerce Web site's server
- Software vendor

Picture 4: Attacker's targets



Source: own

Now let us explain each of these attacks: [18]

- Tricking the customer – For attacker it's very easy to trick customers. They observe customer's behavior and collecting information which will be useful to use against customers. For example, many customers use some number or word as password which can be related with them. So if attacker discovers this word or number customer will be in trouble, because customers often use same password for other websites too. There is also famous phishing attacks. Attacker creates website which looks like as famous website. For instance, <http://www.dell.com> can be registered as www.dell.com. As we can see if you don't pay attention, you will not see any difference. Customer will type ID and password and this information will be sent on attacker's email.
- Snooping the customer's computer – One of the best tools is SATAN to find entry into customer's system. There are many techniques, which can be used to find entry into customer's system, if open ports will be found. Attacker can scan information about passwords.
- Sniffing the network – In this case attacker can observe and monitor the data flow between customer's computer and the server. He can find and steal information about customer's credit card. There are some advantages in this attack. When attacker's location is in the middle of the network, attacker's attack will not be practical. The information which is sent from user's computer to the server is divided into packets. When these packets leave user's computer then server reconstructs them. These packets are sent to different routes. So in this case attacker could not catch all packets and it is not possible to decipher what kind of information was sent.
- Guessing customer's passwords – It is the easiest way to attack, you just need to guess a customer's password. There are two kind of attack: manual and automated. In case of manual, attacker can guess customer's password. If attacker has any information about this customer, if he or she uses child's name or date of birth number, the attacker will use this information for attacking. In case of automated attacks, attacker uses tool which check all words which can be used in ID and password.
- Attack, which denies service – This kind of attack impact on website availability. Attacker force server to work with different risky tasks together, so this means overload of server. As example we can take, if we have some meeting and all members

of meeting ask you your name. After some time they repeat again asking. For computers it is used ping to ask names. Using ping it is possible to create Dos attack.

5.3.2 Defense of e-commerce system

As it is mentioned in previous chapter, there are many attacks on e-commerce system, but still remains secure and safe. All companies have huge information in this system, so they do everything to protect all this information. They are using different kind of defenses for their system.

There are many choices to ensure e-commerce system defense: [19]

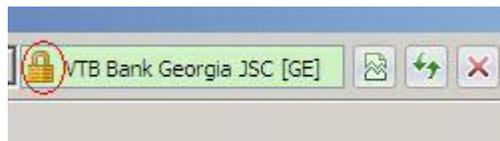
- Personal firewalls must be installed on user's computers.
- Confidential information must be stored in encrypted form.
- Use Secure Socket Layer (SSL) to be sure that your information flow between customer and website is secure.
- Use policies which describe what kind of password is secure. Use firewalls.
- Use strict polices for ensuring security. Also best choice is to use external security audits for protecting web site.

Let's define these security defenses: [19]

- Education – It depends on customer's knowledge. If customer uses weak password or says password to someone, then this user is sacrifice for attacker. It will be better for attacker if he guess administrator's password, but in many cases the administrators account could not be access from the outside the firewall. All users must know all about these danger attacks and they need to understand phishing schemes, how they work.
- Firewalls - When computer is connected to a network, you can be attacked. Personal firewall protects your computer. There are some limits of traffic. Attacker can scan user's hard disc for detecting some stored password.

- Secure Socket Layer (SSL) - Secure Socket Layer is a protocol which encrypts data between the customer's computer and e-commerce website server. In case of request SSL protected web page, the server will be identified as trustworthy. The information which transfers back and forth via network cannot be read because it is encrypted. The content of this data will be incomprehensible. Government gives SSL Certificate to e-commerce companies. Customer browser automatically checks e-commerce website is certified or not. If site is not certified, browser shows warning that site is dangerous. Browser can check if you are in SSL. Windows explorer example is shown on figure 10. There is browsed VTB Bank's internet banking website.

Picture 5: Secure icon in Internet Explorer



Source: own

- Server firewalls – Firewall looks like a fence of castle. Request can be enter into the system only from some special port and from the computer which is registered. The best solution is to create a demilitarized zone, where will be two firewalls. The first firewall will be located between web server and customer, which will allow sending and receiving http requests. In this case customer will be able to communicate with web server. Another firewall will be behind the e-commerce server. This second firewall is more secured and only trusted request from trusted servers can enter into the e-commerce server.
- Password policies – There are some password polices which must know customers. We can see example of password policy in the Table 1 which is part of the Federal Information Processing Standard (FIPS). [20]

Table 1: Password policies

Policy	Value
Account lockout threshold	6 attempts
Consecutive unsuccessful login delay	10 seconds
Matching user ID and password	N (no, they cannot match)
Maximum occurrence of consecutive characters	3 characters
Maximum instances of any character	4 instances
Maximum lifetime of passwords	180 days
Minimum number of alphabetic characters	1 alphabetic character
Minimum number of numeric characters	1 numeric character
Minimum length of password	6 characters
Reuse user's previous password	N (no, cannot be reused)

Source: FIPS [20]

It is possible to choose different policies, it is up to company management. As an example, we can choose to block administrator account if there will be 3 failure in password typing instead 6 time failure. These policies protect users from attacking and guessing passwords. Depend on these policies you can create strong password, which cannot be easily broken.

- Intrusion detection and audits of security logs – The best decision in security strategy is to find potential attackers. It is possible to observe how system traffic works. Let's consider we have inculcated a password policy as we mentioned above. If customer fails six times typing login, his or her account will be blocked. Then customer needs to go to this company to explain situation or administrator can solve this problem and unlock customer's account.

5.4 Types of e-commerce

There are different types of e-commerce. Each of them shows relation between two sides. We can divide these types by market relationship, who is seller and how is consumer. Only two types are different from others: P2P and m-commerce which are based on technology.

This classification is very important because we can analyze financial and business models. For some businesses logistic is very important, big challenge is delivering products or goods. These problems we have in case of physical good but in case of electronic products, there is no problem, because customer can easily download from web site after paying online. In case of selling tickets, we need many parameters such as seat location, ticket is refundable or not, availability and etc.

The main types of e-commerce are: [21]

- **Business to Business e-commerce (B2B)** – In this case in both places we have businesses. The volume of B2B e-commerce is tremendous. There can be relation between two huge companies. Business-to-business e-commerce is very different from business-to-consumer e-commerce. In case of B2C company sells good straight to customer, but in B2B commerce there are some arrangement between companies. This kind of e-commerce in many cases is not for making profit, but it is good for connection and negotiations between two companies.

When B2B concept appeared in the world, it became easier to connect two companies with low cost. If company is electronically connected with its supplier, they will get:

- Lower inventories
- Best prices
- regulated accounts in real time

For example, inventory level of raw material can be monitored by e-commerce system. System can automatically chooses, which supplier is the best to order. This is real good benefit and decision to invest in B2B infrastructure.

There are two helpful processes in business to business e-commerce:

- Possibility of data exchange – We can take as example Electronic Data Interchange (EDI). We already mentioned about it in previous chapters. EDI was one of the old technologies of e-commerce.
- Cycle Time is reduced – transformation of data exchange from real time into auto-triggered business processes caused reduction of time cycle. Also this new system has low cost, high productivity, high quality and of course faster delivery.

All kind of businesses have possibility to set up B2B e-commerce system. In case of little businesses, they can not to set up this system and use different online marketplaces:

- Customer who buy product – For example if you are customer who wants to buy something, you can do website and post requirements and companies which sell this product, they will contact you. This kind of process is good for buyers, which often needs some kind of product and also amount of product is huge.
- Sellers (companies which sell some kind of goods) – If you are big company, it is possible to set up B2B e-commerce and customers will see offers from company and they will place order. This kind of e-commerce is similar to business to consumer e-commerce.
- E-marketplaces - Marketplaces are websites which just connect two sides: companies and customers. For many companies it's very easy to transact at marketplaces.

Business to business has two important parameters: e-marketplace and e-infrastructure. E-infrastructure includes the following components:

- Logistics – Everything which is connected with logistics: distribution, transportation and etc.
 - Application service providers - hosting of website and management of software with remote control, such as outsourcing.
 - Outsourcing of e-commerce process, web hosting, system security and controlling customer care.
 - Auction websites with live auctions.
 - Web-based e-commerce.
- **Business to Consumer e-commerce (B2C)** – Everybody think that e-commerce is B2C e-commerce, because for ordinary people only web sites are known such as Amazon.com and ebay.com. The problem is that logistic cost of B2C is high and cause on growth of this type e-commerce. This type of e-commerce is online businesses which want to have relationship straight to individual customers. For example, e-shops, online information services and etc. Business to consumer e-commerce has low cost transactions. It means that you don't need to pay for searching information about some product. Customer has access to e-commerce web page, where can be found good prices for some good or services. It is very easy to enter on the market with web site, which is cheaper than installing some other technology with high price. Business to consumer is attractive for companies because additional cost of distribution is saved. Countries, where internet grows faster and more people are involved, promotion of information products are easier. So this type of e-commerce is really good for both sides, for companies and for customers (buyers) too.
 - **Consumer to Business e-commerce (C2B)** – In this type of e-commerce customers such as ordinary people and individuals offering some product or services to companies. Companies search these products and making online payment with online transaction. C2B is opposite of B2C, where companies pay online to customers. For individuals this technology is the best because it is cheap and available in all over the world. Of course it can be innovation in businesses, it is possible for companies to buy for example some innovative ideas from ordinary people and it means there are good

relationship between ordinary people and companies. It is same in wine business. If wine maker is not business man and he just produce wine for his family, he have chance to think about selling wine and he can do it online, he can offer wine to distributor companies on just big wine making companies. Consumer to business e-commerce is possible to be done electronically.

- **Consumer to Consumer e-commerce (C2C)** – When we are talking about consumer to consumer e-commerce, we always remember ebay.com. Ebay.com is very popular website for selling some product between customers. As we know ebay.com is a business, so the second name of this type of e-commerce will be consumer to business to consumer e-commerce (C2B2C).

Other examples of consumer to consumer are:

- Half.com
- Online Ad or Classifieds
- Amazon.com

Consumer to consumer e-commerce has many benefits. The best from these benefits is low costs. Customers who sell can easily post their product on the C2C e-commerce websites very cheap or it can be free. You have more chances to sell or buy products, when both sides, customers who buy and customers who sell will come together. One of the best benefits is also that small businesses can increase their profit using consumer to consumer e-commerce, they don't need to open physical store, which needs money. Companies just need to post pictures and information about products. Another benefit is to sell personal items. For example: some handmade gift or personal art. In case of wine ordinary people can buy and sell wines between each other.

- **Business-to-government e-commerce (B2G)** - B2G is the electronic relationship between companies and government. This type of e-commerce is used to make different operations such as licensing procedures and operations which are related to government. There are two features in this type of e-commerce: first one is that public sector has main role in building e-commerce technology and second is that government

need to make this system effective than it is. In this type, companies making transactions with the government using Internet. For example, companies can pay their taxes using internet technologies.

- **Government-to-Business e-commerce (G2B)** – G2B helps companies and government to make transactions from public sector to business organizations. Good example is tenders from government. There are some projects such as road construction. Government will declare tender and company which will be winner, they will get money online from government. Government is able to make transaction using G2B e-commerce system.
- **Government-to-Government e-commerce (G2G)** – In this case we have relationship with two government. G2G e-commerce allows transactions between two governments; also it's possible to share information and experience. For instance Georgian governments want to buy oil from Azerbaijan Government. These two countries have possibility to make transactions with G2G.
- **Government-to-Consumer e-commerce (G2C)** – In G2C e-commerce government pay online to individuals. They are using G2C for transactions. For instance, government can pay pensions via G2C system.
- **Consumer-to-Government (C2G)** – In case of C2G e-commerce customer can make transaction to government. For instance, customers of this system can pay income tax or some kind of real estate tax online. This system is very popular in e-government.
- **M-commerce (mobile commerce)** – m-commerce is system which allow you to buy and sell goods and services via mobile technologies. Japan is a number one country, where these technologies are used. This technology is different from other types of e-commerce.

5.5 Importance of e-commerce in developing countries

In many developing countries, we have the following schemes of online transactions. We have two types: payments in traditional way and electronic payment.

In case of traditional way of payments we have:

- **Cash-on-delivery** - In many companies you can just order some product online. When product will be delivered physically you will pay by cash. So in some developing countries still is problem to pay with credit card. Same situation is in Georgia. As we mentioned in the beginning of this thesis, there is only one bank which has payment system which is verified by Visa. You can buy products online with all kind and also with foreign credit cards.
- **Bank payments** - When you order online and confirm this order, then you pay by credit card from bank account. Of course this kind of payment is better for both sides, for customers and for business organizations. For instance, if you buy air line ticket, you don't need receive this ticket. You will electronically receive e-ticket, which will be automatically saved in database. Before flight you just need to show passport in during check-in and airline consultants will print you this ticket. Also the main reason for buying ticket online is that e-ticket is cheaper than bought ticket in some agency.

In case of electronic payments we have:

- **Innovations which affects on customers** - In this payments method we have credit and debit cards. Also automated teller machines (ATM) and electro banking. These technologies of e-commerce really affect on customers. Life is becoming easier.
- **Innovations which enable e-commerce** – In this method are electronic cash, smart cards, credit cards which are encrypted. In developing countries these method are not so popular. Only big companies using these methods for secured transactions.
- **Innovations which affect on companies** – This is method, which bank use for their clients.

In developing countries, small and medium businesses use e-commerce system because it has two very important advantages. Companies have reduced information searching costs and transaction costs. It means that time is reduced for payment process. For small and medium businesses in developing countries, there are some important parameters: design of product, different markets, customer needs and finances.

Sometimes there is discussion about information on the web. People think that there is not enough relevant information for small and medium businesses in developing countries which will help to increase investments in internet access. The problem is that most enterprises work only on local market, they can of course start global business, but they want to use local information and local business researches, which is not suitable for global business. Also Companies must increase their quality of goods and services. If small company wants to increase their profit, they need to make research of global market. For instance, in Georgia most of e-commerce small and medium size companies work for local market. Of course when you start business, you need to start from little market, but if company wants to be successful, if they have chance, all possibilities must be used.

There are many factors which makes problems in growth of e-commerce in developing countries. The usage of internet increases similar in developing and developed countries. Companies using internet and they are informed that security of network is not guaranteed. Also in some countries there is very slow internet and connection is not stable. These reasons are not only problems for companies; they also have very bad knowledge of internet and ICT. So for such countries, there are always problems. We know that there are very strict visa regulations for developing country's population. They need huge amount of documents to visit for instance European Union countries. So in this case good decision will be to do online shop and sell products online. Developing countries will increase exports in other countries in such way. Also for companies will get more profit from this. [22]

There are some benefits using B2B e-commerce in developing countries:

- **Low transaction costs.** There are some types of costs which are reduced by using B2B e-commerce. One of them is which we already mentioned in previous chapters, it is searching cost of goods or it can be services too. Customers who buy can easily open e-commerce web page and see catalog of products. It is possible to see all kind of information about products. Using internet is saving time and money. Of course it's very easy to find any kind of information in it. For example, business man wants to

expand his business and wants to sell new product. (imported product) He has no information about it. He can easily search all kind of information about that product. Both users of B2B e-commerce, sellers and buyers are together in one online community of trading. They are helping to each other for reducing searching cost. Another type of reduction is transaction process cost such as purchase orders, invoices and some other online payments. B2B e-commerce automates these transaction processes, so time spent is fewer. It is possible to sell product through online auctions. For example Georgian government has web page where you can buy some kind of products through online auction. (<https://www.eauction.ge/>) B2B e-commerce also polishes up logistics.

- **Disintermediation.** Using B2B e-commerce, it is possible to use e-market for direct transactions between buyers and suppliers, also there are not involved other companies or distributors. Sometimes these e-markets are intermediaries, because they are between buyer and seller.
- **Transparency in regulating prices.** One of the best benefits of e-markets is transparency in price. Huge number of sellers and buyers are together on one e-market, so all information about transactions is transparent. All transactions and single purchases are accessible for all users of e-market. Based on price transparency, prices on products are decreasing in the market. In this case, customers who want to buy product can compare different prices from website catalog and make better decision in choosing product. There is no additional price when purchasing for product, B2B e-commerce is really good communication network for two businesses.

5.6 Developing of e-commerce in Georgia

It's very interesting, how electric commerce develops in Georgia and what are the main problematic factors, which makes problem in developing. Telecommunications', information technologies' and innovations' departments of Ministry of economy and Sustainable development make new steps for developing. There are many meetings where are delegations

from public sector, from ministry of Finance and Ministry of Justice. There are also delegates from bank sector and express transportation companies such as DHL and Georgian post. Also there are delegates from many information technology companies, which were actively involved in discussion. From this discussion there is shown problems, which are resistances in developing e-commerce in Georgia. At first it's very important to establish right laws for regulating such kind of problems, which can be interfere in developing of e-commerce in Georgia. Ministry of economy and Sustainable development must create these right laws. There will be involved Ministry of Justice and agency of data exchange in this process. The main new step in development will be to make easier starting e-business: making online shops and creating e-commerce systems. It is possible to offer business companies such models, which will be useful to get complex services in low costs. Government works on making concrete place, where all companies will be able to get all kinds of services. Of course, this will be interesting innovation which will make process easier to create internet shop.

It is important that Ministry of Economy and Sustainable development will organize such kind of meetings, where will be discussions about solving problems. To make e-commerce very popular in Georgia, it will need to change strategies of present e-shops and of course increase faith of Georgian customers. Government has plans to collaborate security strategy, also to involve bank sector in current process and for offering complex decisions to customers.

For development e-commerce in Georgia, we have main priority to create new legislative-normative base: cyber security, logistics and high quality ordered product delivery service, defense of customer rights and popularization of e-commerce.

In summer 2011 appeared new multi system of e-commerce. Vovovo.ge was the innovation in B2C e-commerce companies in Georgia. This company has different kind of services:

- **Vo Banda** – is a sale on goods and services, which can be bought if some group of customers will buy this good or service. For example it can be 50 % sale on some product and 10 people must be in total for this sale, if you want to get this discount. Here are presented different profile companies: restaurants, bars and cafes, Saloons of beauty, cinemas. If you are interested with some offer, you just need to push button

“order”. The amount of price will reserved from the credit card. If the amount of people will fill minimum amount of this discount, the reserved money will be cut off from credit card. If there will not be enough amounts of people, reserved amount of money will be returned to customers credit card account.

- **Bringing ordered goods from foreign e-shops in Georgia** – you need to register on vovovo.ge for this service. After registering on website, American and European addresses will be shown for customer, which can be used for e-shops. Ordered product will be delivered in these addresses an after that company will ship this product to Georgia. This service has good benefits:
 - Transportation of parcels in low cost
 - Decreasing of parcel in weight and size
 - Counting of real weight
 - Different methods of payments
 - Dexterous system of parcel tracking
 - Courier service in all territory of Georgia
- **Buy for me** – This service is for customers who cannot buy goods online themselves. Company helps to buy product.

There are similar websites in Georgia which we mentioned above. One of other company is ideals.ge. This company works only with discounts. There are different goods and services on this web site. But it has one disadvantage; it is possible to pay only with Bank of Georgia’s American express card.

6. Georgian Wine

6.1 History of Georgian wine

A great wine expresses the characteristic of people and land. This is the reason why everybody thinks that there is one birth date for Georgian culture and wine culture. There were found cultivated grape variety "vitis vinifera sativa" which is 6-7 years old and about 3-4 thousand years old heavy wine earthenware "Kvevri" during archaeological digs. These foundations confirm fact that Georgian culture and wine culture have same date of birth. Some etymologists consider that the modern word "wine" comes from Georgian word "gvino".

There are many traditions and legends in Georgian culture, where we have great appreciation of winemaking. Many famous travelers and writers describe Georgia as a land of wine and first winemaking country. The first is Apollonius of Rhodes, Who adores Georgian wine in his Argonautica which is written in 295 BC.

The taste of wine which is born on the land of Alazani valley surrounded with Caucasian mountains, heroes, writers, arts can be compared only with epic journey in Global history.

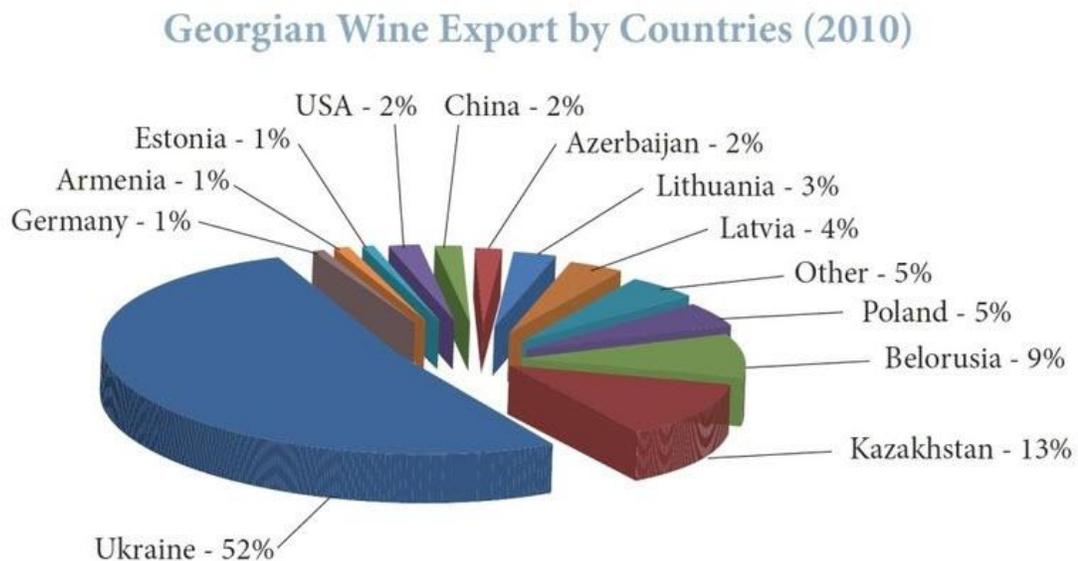
Georgian wines are unique and excellent because there is perfect matching of soil and climate. Also Georgian wine has centuries of experience and different kinds from each region of Georgia. Georgian wine is white and red, it can be sweet and also Ice-wine. It is indisputable that Georgia can produce wine, which can be suitable for any persons taste. The great devotion to wine has kept alive over 500 ancient Georgian grape kinds – 38 of which are used for commercial wine production in Georgia today.

6.2 The main advantages of Georgian winemaking

Qvevri is not only Georgian inheritance; it's also World cultural inheritance. Everybody thinks that Qvevri's wine will make modern wine market more various than it is. Many foreign scientists research this ancient earthenware and they declare that it has really good properties for wine. Nowadays many foreign winemakers use Qvevri to save wine in Georgia and distribution companies increasing export of Qvevri wines. Experts think that Qvevri will be reason of success for Georgian wine in foreign countries. On figure 8 we can see countries where Georgian wine is exported. This data is 2 years old and there can be little changes in it.

Figure 5: Georgian wine exports by countries [23]

Georgian wine production (2010): 19,060,000 liters = 74,550,000 GEL
(Average 2010 Exchange Rate 1USD=1.8GEL).



Source: Invest in Georgia, National investment agency 2010

The main advantage of Georgian wine is Qvevri's wine which can be used for sales strategy and planning business. There are 500 varieties of wine. From here 30 varieties are used currently in wine making.

There are about 4000 varieties of wine. From here about 450 varieties comes from Georgia.

Here we have the amount of grape's varieties in different regions of Georgia:

- Kakheti – 88 varieties
- Imereti – 78 varieties
- Qartli – 62 varieties
- Guria – 59 varieties
- Racha – 54 varieties
- Apxazia – 48 varieties
- Samegrelo – 47 varieties
- Adjara – 47 varieties
- Lechxumi – 35 varieties
- Mesxeti – 9 varieties

There are some other competitive advantages of Georgian wine:

- Unique varieties of grape
- Longest tradition of wine making
- Balance of price and quality
- Growing economy
- 0% entry tariff for Georgian wine in more than 50 countries

So if we want to increase export of Georgian wine in foreign countries, using information technologies it's possible to do it more easier. Georgian wine online selling system will at first good promotion and also selling wine in reduced costs. As we mentioned above, there are more than 50 countries where are no entry fee for Georgian wine. We can use B2B e-commerce and B2C e-commerce systems for selling.

7. The online selling system of Georgian wine

7.1 Projecting of online selling system using UML

Nowadays technologies' developing time is increasing very quickly. It is really revolution in information system. All these technologies are involved in business. If you want to have successful business, you need introduction of new technologies. In previous years, it was difficult to have relationship with other companies, because there were no phones, computers and internet, but in modern world everything is possible. To buy wine online was impossible, you needed to go to the market or shop to buy wine, but now it's possible to buy it online. Today the process is much easier and can be done from home via the internet. It is possible to open website in browser and choose from catalogue and order. It is possible to pay with credit card, make online transaction.

We use UML Tools to create diagrams: Class diagram, State diagrams, Sequence Diagrams and Use-Case diagrams to model an online selling system, which will be perfect for ordinary customers and for distributor companies. The design and analysis cover basic functionality of online selling system from the customer's and distributor company's point of view on the system. [24]

7.1.1 Problem Description

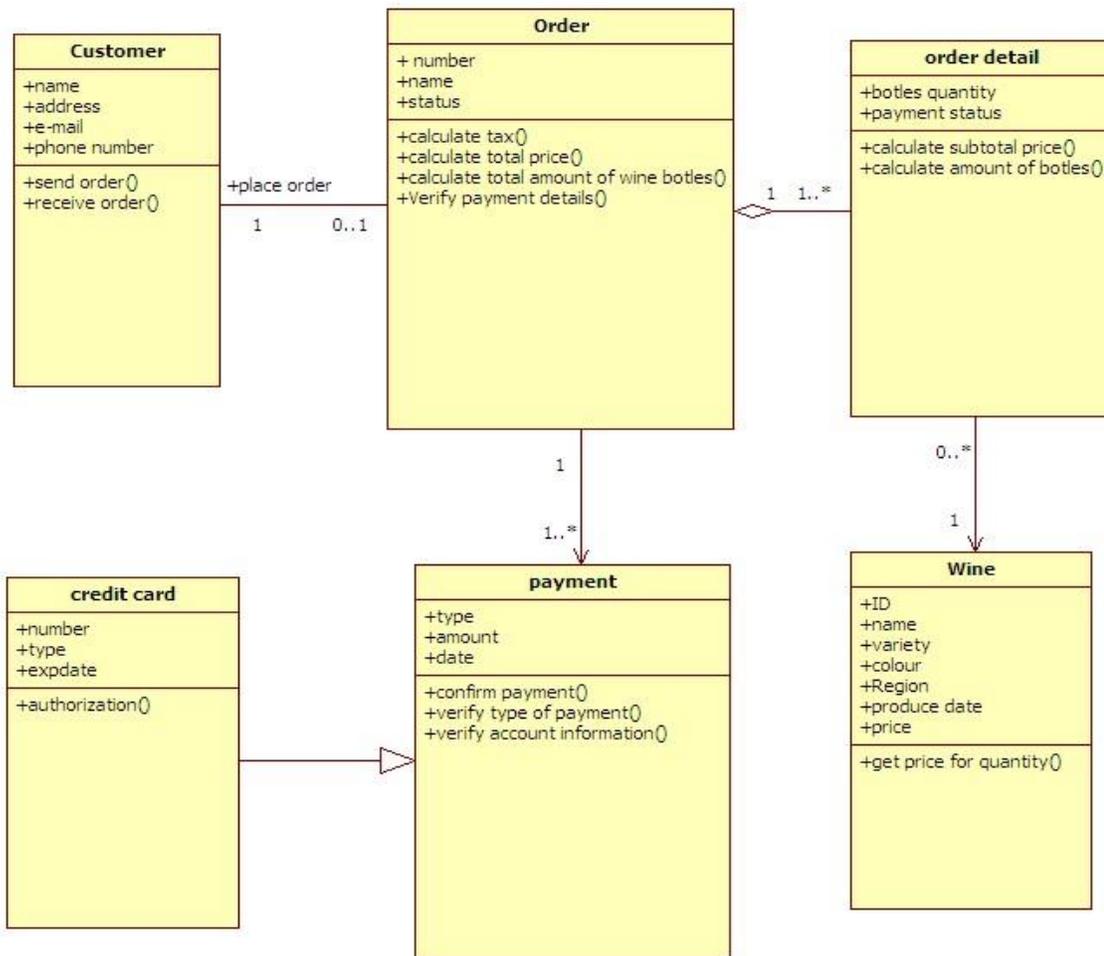
Georgian wine company „Wine house Gurjaani” which is located in Kakheti region produces different varieties of wines. This company has very simple website (<http://www.winehousegurjaani.ge/>), where is possible to view just only catalogue of wines. It is not possible to order online. This company has three shops in different cities of Georgia: Tbilisi, Telavi and Batumi. Owner wants to expand his business. He wants to invest in information technologies and make online selling system. He wants to have two kind of relationship with customers. First is to have straight connection to ordinary customers and second is to have relationship to distributor companies. He wants website which will be easy to use. Customers must easily choose product and order. After ordering it must be allowed to pay online with different type of online transaction systems. This service must work not only Georgia, also in foreign countries. Owner has second request to make online selling system for distributor companies. It will have same services, just there will be some different features comparing to B2C system. So as we can see, he needs B2C e-commerce system for ordinary people and B2B e-commerce system for distributor companies.

7.1.2 Class diagram

Class diagram show us classes and relationship between classes. Class diagram is static because it show interaction, but it is not possible to see what process we have when these classes interact.

Diagram 1 shows us the ordering process of wine from online shop. It is used UML tool “StarUML” for modeling the class diagram. We have central class order. Order is associated with payment. There is aggregation between order and order details. It means that order has order details collection. There is generalization between payment and credit card; it means that payment is super class of credit card.

Diagram 1: Class diagram of online selling system



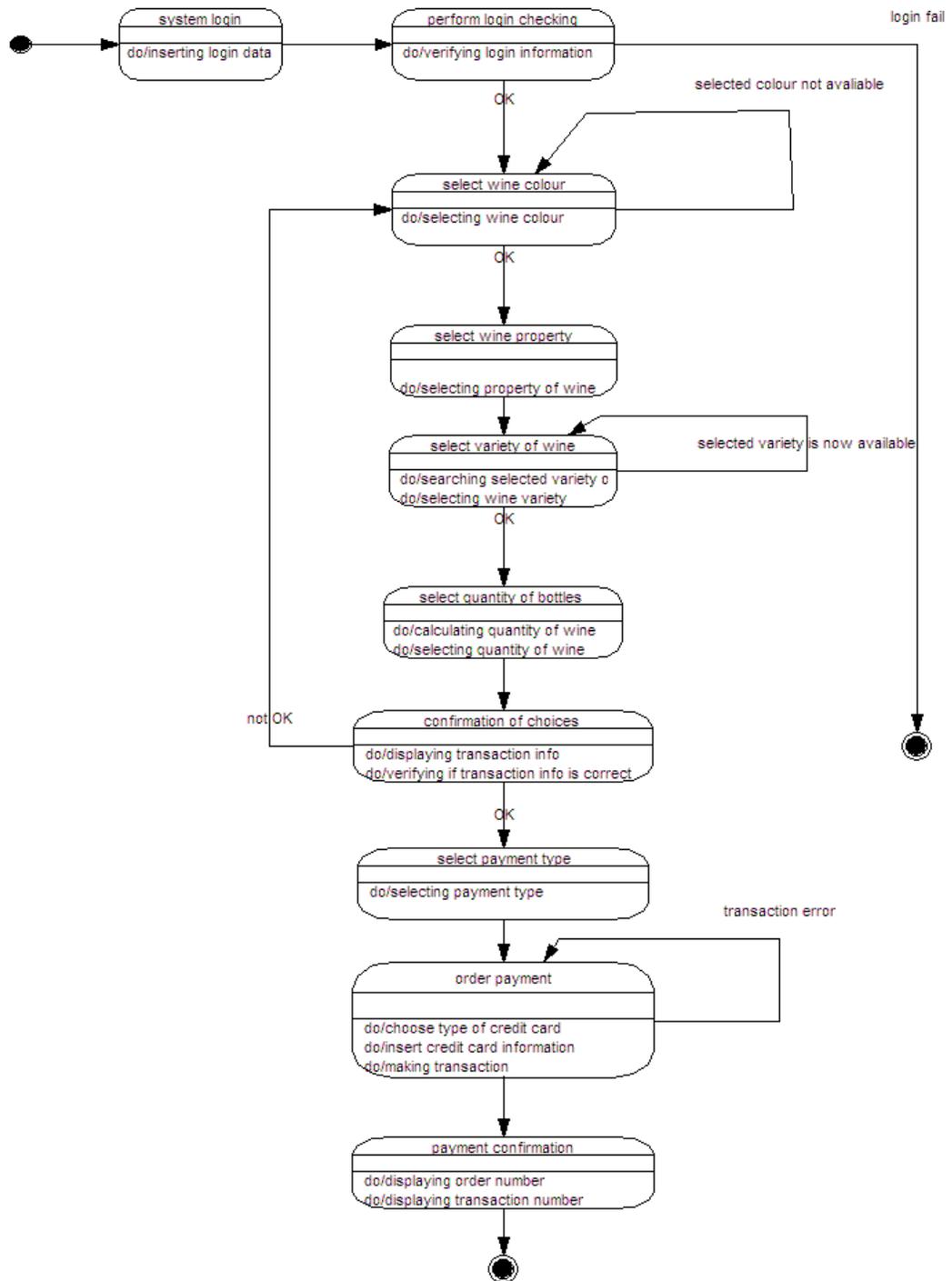
Source: Own

7.1.3 State diagram

All Objects have states and behaviors. A state machine also called state diagram is a behavior specifying the sequence of each state states. State of object is depended on its activity. A state diagram shows the states of the object and the state's changes which is caused by transitions.

In our example we have login process and then wine order process with payment. Of course customer must be registered on our system. It is needed to type valid ID and password for logging into system. On diagram 2 we can see all states and process of ordering and payment. We use UML tool Meta edit for modeling.

Diagram 2: State diagram of ordering process

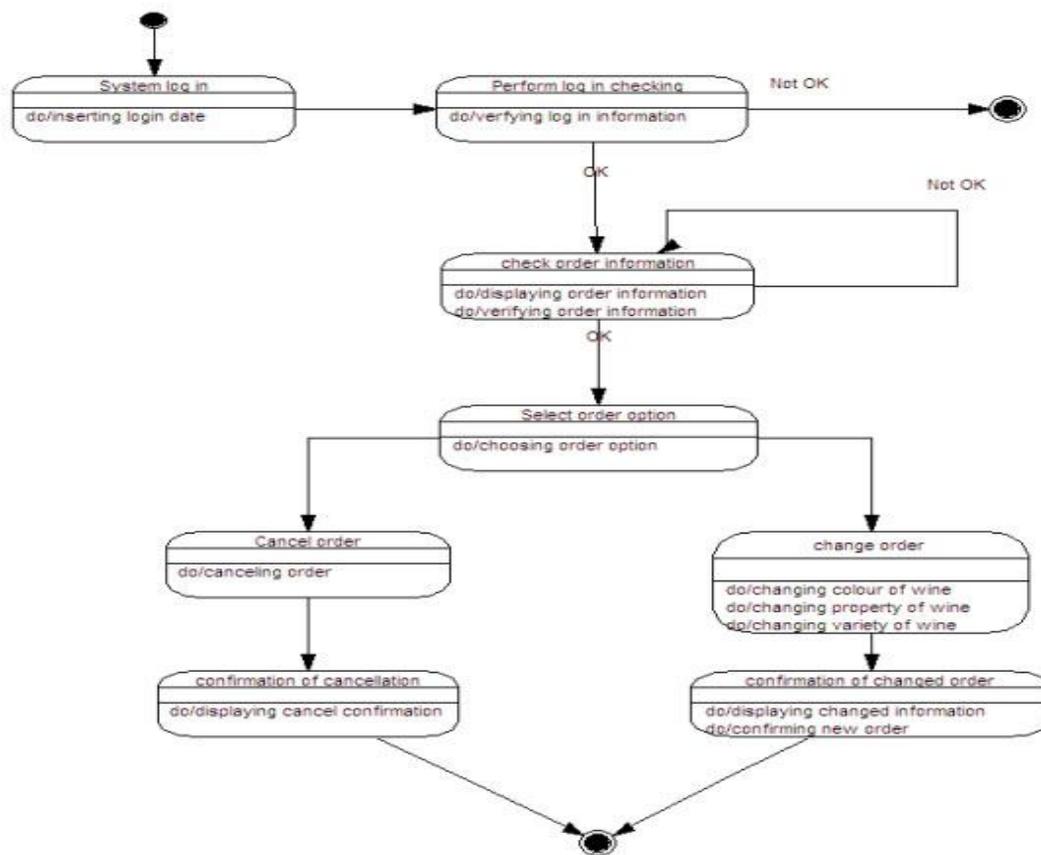


Source: Own

This state diagram shows us the whole ordering process. If logging in the system is successful; the first step of buying wine is choosing colour. It can be: red white and pink. If there is not anything in selected colour, it means that e-shop has not this colour of wine at that time. After successful selection of colour, it is possible to choose wine property. In this case we can choose dry, semi dry or sweet wines. Next step is to select variety of wine. For instance: Mukuzani, Akhalsheni, Napareuli, Saperavi, Kindzmarauli and etc. After choosing variety, if it is available, we choose quantity of bottles. System shows us our choice and we can confirm it. The last step is choosing payment type. For example: PayPal, Pay Sec, pay with Credit card. We see confirmation number of order and payment.

Many companies don't have order cancellation in their system. In our case we will have it. It will be possible to cancel or change order.

Diagram 3: State diagram of order change or cancellation

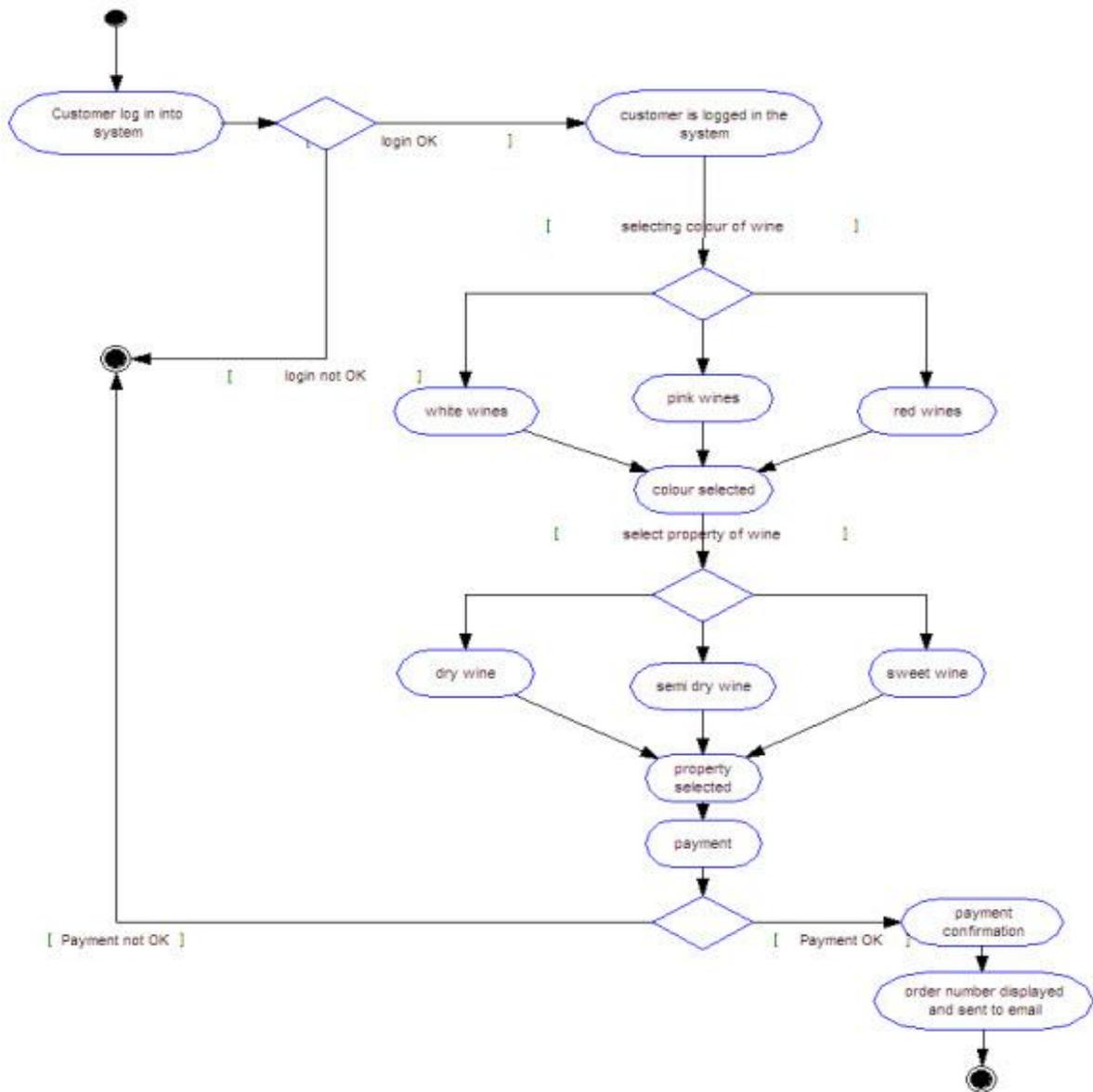


Source: Own

7.1.4 Activity diagram

Activity diagram is like flow chart. We can see each step with decisions. Also this type of diagram and state diagram are similar. The activity diagram presents us how activities depend to each other.

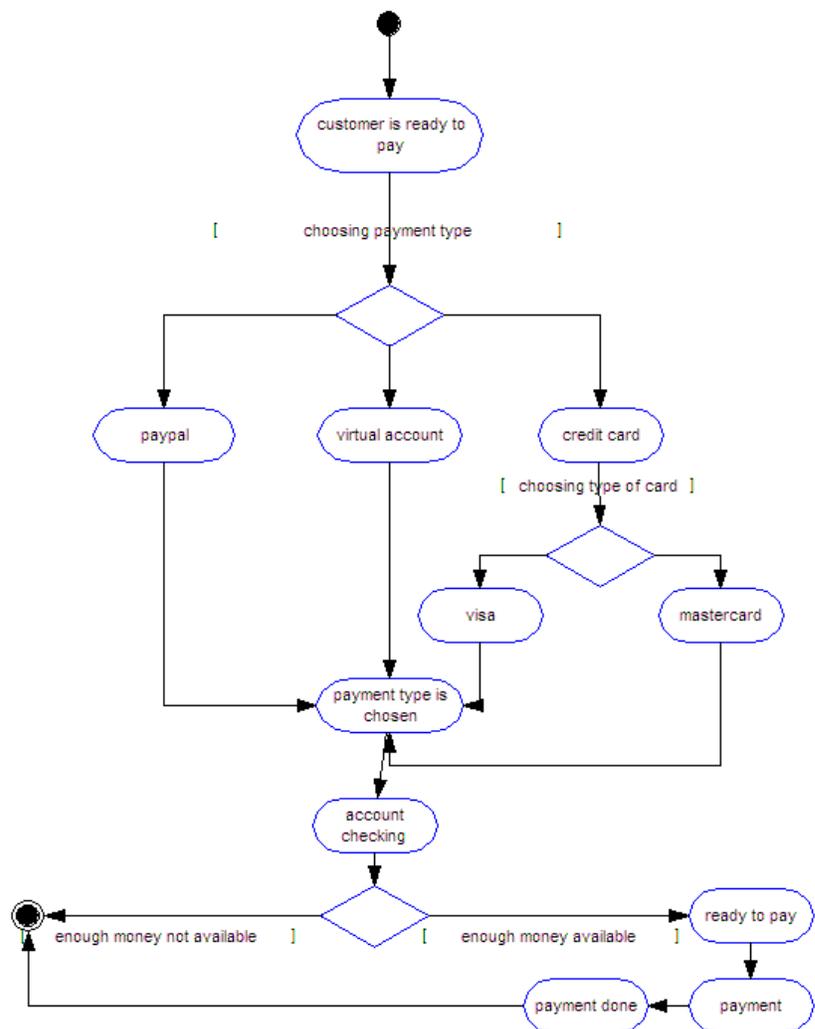
Diagram 4: Activity diagram of ordering process



Source: Own

Here we have activity diagram of online selling system's Payment process. It's very easy for customers to use it and to pay online. They have choice: they can charge virtual account using pay box machines and pay from there, or they can choose PayPal or credit card payment.

Diagram 5: Activity diagram of payment process

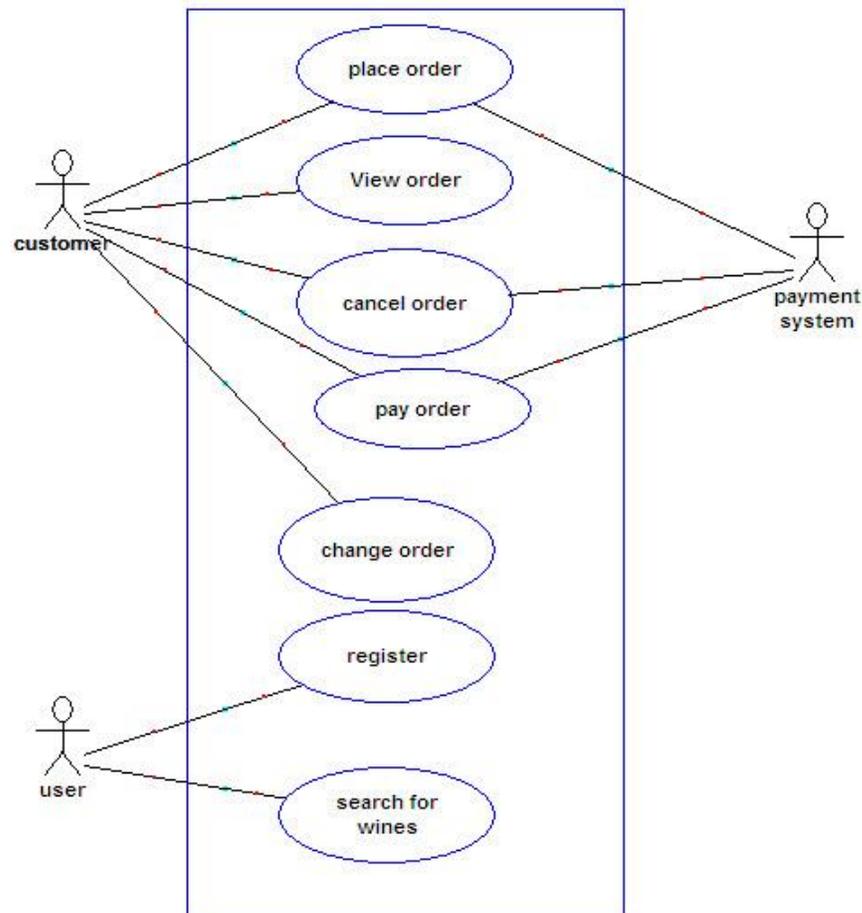


Source: Own

7.1.5 Use-Case Diagram

Use case diagrams explain relationship between actors and system. There are actors, connections and use cases in use-case diagram. In our example we can see that there are 3 actors and 6 use cases. Ordinary user can only search catalog of wine or register. Registered user, customer can place order, cancel order, view order and pay for order. There is also sub payment system, which is connected with 3 use cases: place order, cancel order and pay order. So this sub system works with order and payments.

Diagram 6: Use-Case diagram of online selling system



Source: Own

8. Statistical research of Georgian wine online selling system

8.1 Czech residents' opinion about Georgian wine.

8.1.1 Introduction of the case study

The purpose of the study was to estimate what Czech residents think about Georgian wine. In residents we mean not only Czech citizens, also foreign people who are residents of Czech Republic. We are interested how often they drink wine and alcohol drinks in general. This case study will help us in planning of e-business.

There were sixteen questions in all to guide us for the study. These questions help us to understand people's opinion about wine. How often they drink wine, which color of wine they like. What they think about quality of Georgian wine. Which nation can be target of company.

In all we targeted 150 respondents but had 145 responses. This implies that 145 was our sample size for the study. In the Appendix A of this document are the questionnaires we used for the study.

In this project we analyzed our data based on the following:

Two - hypotheses (one-side and two side). $H_0: \pi_1 = \pi_2$

Test criterion

Table value $\rightarrow u_{0,05} = 2.0030$

$$\bar{p} = \frac{m_1 + m_2}{n_1 + n_2} \quad n = \frac{n_1 \cdot n_2}{n_1 + n_2} \quad \bar{q} = 1 - \bar{p} \quad u = \frac{f_1 - f_2}{\sqrt{\frac{\bar{p} \cdot \bar{q}}{n}}}$$

- Contingency tables (2x2, 2x3, 2x4, 4x4)
- Chi-square test
- Fisher's Exact Test

To enable us use analyses appropriately the data, we employed different statistical methods in our research. We first used table analysis to find the relationship between Gender of our respondents and status. We use SAS software for analyzing statistics.[25]

8.1.2 Analysis of relationship between status and Gender

It can be seen from the table that 48.97% of our sample represent Males while 51.03% are Females. Still in the table there are a total of 40.69% representing students, 24.83% representing Employed people, 20.69% representing unemployed people and a total of 13.79% represent retired people seniors. We can see graphical table of the total amount of status and gender in appendix A.

Table 2: Statistics of Gender by status

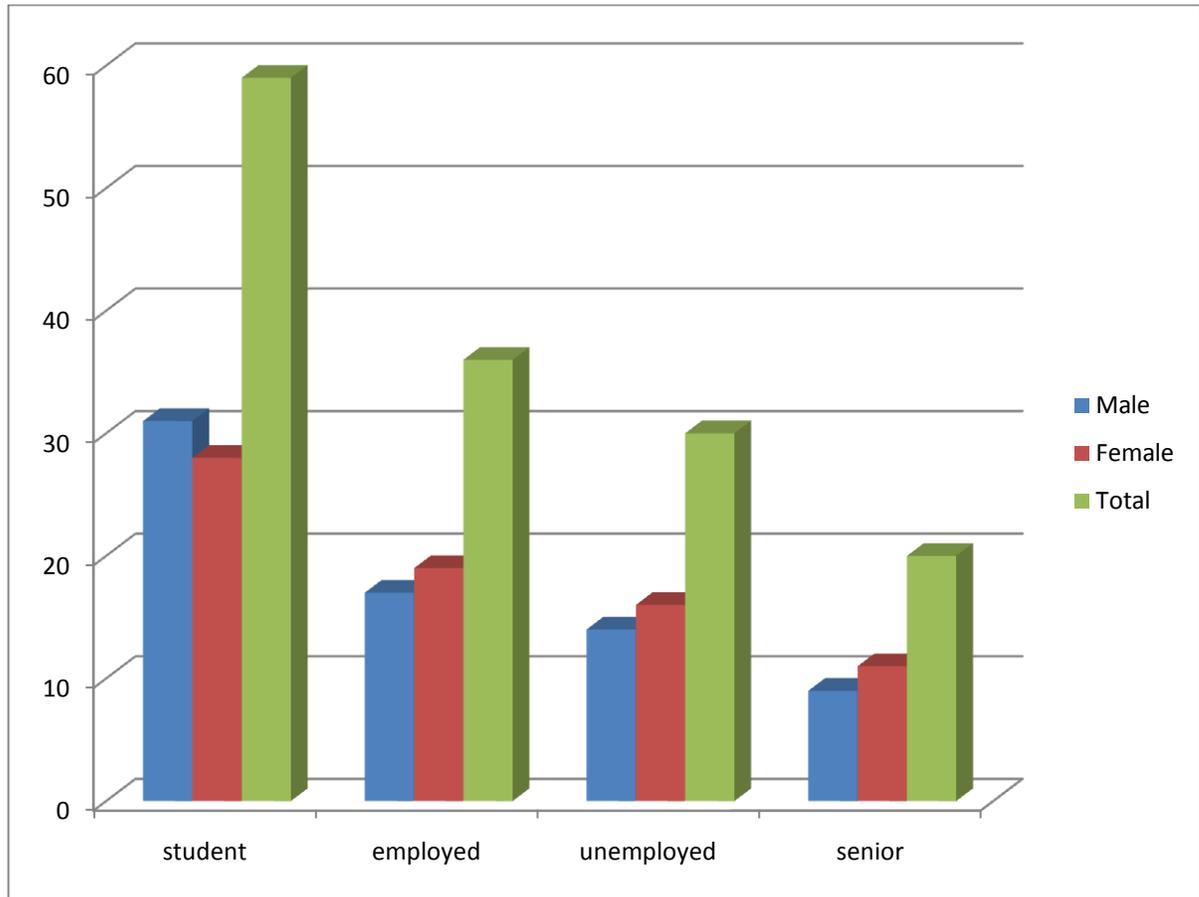
Statistic	DF	Value	Prob
Chi-Square	3	0.5351	0.9111
Likelihood Ratio Chi-Square	3	0.5355	0.9110
Mantel-Haenszel Chi-Square	1	0.4547	0.5001
Phi Coefficient		0.0608	
Contingency Coefficient		0.0606	
Cramer's V		0.0608	

Source: Own calculation

From the statistics table, we found that all cells had an expected count more than five. This result indicates that there is no statistically significant relationship between the gender and status. It means status is not dependent on ones gender.

8.1.3 Distribution of Gender and Status

Figure 6: Distribution of Gender and status



Source: Own calculation

On this graph we can see the graphical distribution of gender and status. As we can see we have students at first place. Total amount is decreasing from student to senior.

8.1.4 The distribution of age among gender

Table 3: The mean procedure in males

Analysis Variable : Male				
N	Mean	Std Dev	Minimum	Maximum
71	37.028169	17.233664	18.000000	71.000000

Source: Own calculation

Table 4: The mean procedure in females

Analysis Variable : Female				
N	Mean	Std Dev	Minimum	Maximum
74	37.581081	17.651114	18.000000	72.000000

Source: Own calculation

Based on our summary statistics, we conclude that the average age for Female respondents is 37.58 and the average age for Male respondents is 37.03. It means that on average, the values deviate around 17.23 and 17.65 respectively for male and female away from the mean age.

8.1.5 Testing hypothesis

8.1.5.1 Relationship between amount and color of wine

H0: $\pi = \pi_0$

H0: Majority of Czech residents who drink only one glass of wine like red wines.

HA: Majority of Czech residents who drink only one glass of wine don't like red wines.

For the data set analysis we use the Chi-square test where all expected frequencies are more than 5, so it means we can use this test. Our calculated $p=0.9766$ value is more than 0.05, we can accept our hypothesis, H0 is valid

Table 5: Relationship between amount and color of wine

Relationship between amount of wine and colour of wine

The FREQ Procedure

Frequency Percent	Table of amount_of_wine by colour_of_wine				
	amount_of_wine	colour_of_wine			Total
		red	white	pink	
	1glass	22 15.17	19 13.10	18 12.41	59 40.69
	3glasses	13 8.97	11 7.59	7 4.83	31 21.38
	>3glasse	12 8.28	8 5.52	7 4.83	27 18.62
	>1liter	10 6.90	9 6.21	9 6.21	28 19.31
	Total	57 39.31	47 32.41	41 28.28	145 100.00

Source: Own calculation

Table 6: Statistics for table of amount and color of wine

Statistics for Table of amount_of_wine by colour_of_wine

Statistic	DF	Value	Prob
Chi-Square	6	1.2054	0.9766
Likelihood Ratio Chi-Square	6	1.2193	0.9759
Mantel-Haenszel Chi-Square	1	0.0010	0.9754
Phi Coefficient		0.0912	
Contingency Coefficient		0.0908	
Cramer's V		0.0645	

Source: Own calculation

8.1.5.2 Opinion of EU/non EU residents in Czech Republic about importance of Georgian wine e-shop

H₀: $\pi = \pi_0$

H₀: Majority residents of Czech republic agree that Georgian wine e-shop is important for them in Czech republic.

H_A: Majority residents of Czech republic don't agree that Georgian wine e-shop is important for them in Czech republic.

Table 7: Relationship between residents and e-shop importance

PRE Relationship Residents and e-shop_importance

The FREQ Procedure

Frequency Percent	Table of Residents by importance			
	Residents	importance		Total
		agree	disagree	
EU	48 33.10	27 18.62	75 51.72	
Non-EU	44 30.34	26 17.93	70 48.28	
Total	92 63.45	53 36.55	145 100.00	

Source: Own calculation

When we have contingency table 2x2, we can use two-sample test for analyzing. We made calculation and got $u=0.125$. This value is compared with table value $\rightarrow u_{0,05} = 2.003$, So we can accept H_0 hypothesis, because our calculated u is more than table value. It shows that for residents, it is important to be e-shop of Georgian wine in Czech Republic. Calculations can be seen in appendix C.

8.1.5.3 The opinion of Czech residents about costs of Georgian wine in the Czech Republic

$H_0: \pi = \pi_0$

H_0 : Majority of Czech residents agree that Georgian wine is expensive.

H_A : Majority of Czech residents disagree that Georgian wine is expensive.

For the data set analysis we use the Chi-square test where all expected frequencies are more than 5, so it means we can use this test. Our calculated $p=0.78$ value is more than 0.05, we can accept our hypothesis, H_0 is valid

Table 8: Relationship between residents and cost of wine

PRE Relationship Residents and cost of wine
The FREQ Procedure

Frequency Percent	Table of Residents by cost_of_wine					
	Residents	cost_of_wine				Total
		Sagree	agree	disagree	Sdisagree	
EU	21 14.48	19 13.10	16 11.03	14 9.66	70 48.28	
Non-EU	19 13.10	26 17.93	17 11.72	13 8.97	75 51.72	
Total	40 27.59	45 31.03	33 22.76	27 18.62	145 100.00	

Source: Own calculation

Table 9: Statistics for table of residents and cost of wine

Statistics for Table of Residents by cost_of_wine

Statistic	DF	Value	Prob
Chi-Square	3	1.0851	0.7807
Likelihood Ratio Chi-Square	3	1.0883	0.7799
Mantel-Haenszel Chi-Square	1	0.0023	0.9617
Phi Coefficient		0.0865	
Contingency Coefficient		0.0862	
Cramer's V		0.0865	

Source: Own calculation

So Residents of Czech Republic agree that Georgian wine prices are high in Czech Republic. They saw these prices on gedevani.cz.

8.1.5.4 Relationship between frequency of drinking wine and amount of drinking wine

H0: $\pi = \pi_0$

H0: Majority of Czech residents who drink wine frequently can drink much amount of wine.

HA: Majority of Czech residents who drink wine frequently cannot drink much amount of wine.

For the data set analysis we had to ignore the Chi-square test since more than 25 % of expected freq is < 5 .

Alternatively, we calculated Fisher's Exact Test where $\sum p_i = 0.06 > 0,05 \rightarrow H_0$ is **valid**

Table 10: Relationship between frequency and amount of wine drinking

Relationship between frequency and amount of wine
The FREQ Procedure

Frequency Percent	Table of frequency by amount				
	frequency	amount			
	1glass	3glasses	>3glasse	>1liter	
1times(m)	13 8.97	4 2.76	4 2.76	2 1.38	23 15.86
1times(w)	25 17.24	9 6.21	10 6.90	4 2.76	48 33.10
>1times(33 22.76	17 11.72	5 3.45	19 13.10	74 51.03
Total	71 48.97	30 20.69	19 13.10	25 17.24	145 100.00

Source: Own calculation

Table 11: Statistics for table of frequency and amount of wine drinking

Statistics for Table of frequency by amount			
Statistic	DF	Value	Prob
Chi-Square	6	12.0698	0.0604
Likelihood Ratio Chi-Square	6	12.5379	0.0510
Mantel-Haenszel Chi-Square	1	2.3643	0.1241
Phi Coefficient		0.2885	
Contingency Coefficient		0.2772	
Cramer's V		0.2040	
WARNING: 25% of the cells have expected counts less than 5. Chi-Square may not be a valid test.			

Source: Own calculation

Table 12: Fisher's exact test, Statistics for table of frequency and amount of wine drinking

Fisher's Exact Test	
Table Probability (P)	3.542E-07
Pr <= P	0.0586

Source: Own calculation

As we see there is little relation between frequency of drinking and amount of drinking. So if someone drinks wine frequently, it doesn't mean that he drinks much than others.

8.2 What potential buyers from Georgia and abroad think about importance of Georgian online selling system.

8.2.1 Introduction of the case study

The purpose of the study was to estimate what potential buyers from Georgia and abroad think about importance of Georgian online selling system. We are also interested why they want to buy product online, what are advantages of online shopping. This case study will help us to research market and create online selling system.

There are fifteen questions in all to guide us for the study. In all we targeted 190 respondents but had 179 responses. This implies that 179 was our sample size for the study. In the Appendix B of this document are the questionnaires we used for the study.

8.2.2 Analysis of relationship between age and Gender

It can be seen from the table that 53.63% of our sample represent Males whiles 46.37% are Females. Still in the table there are a total of 41.34% representing respondents who are between 16-24, 28.49% representing the age between 25-39, 20.67% representing age between 40-65 and a total of 9.5% represent age +65. The graphical output of statistical program is given in appendix B.

Table13: Statistics of Gender by age

<i>Statistics for Table of Gender by age</i>			
Statistic	DF	Value	Prob
Chi-Square	3	0.8095	0.8472
Likelihood Ratio Chi-Square	3	0.8095	0.8472
Mantel-Haenszel Chi-Square	1	0.0083	0.9275
Phi Coefficient		0.0672	
Contingency Coefficient		0.0671	
Cramer's V		0.0672	

Source: Own calculation

From the statistics table, we found that all cells had an expected count more than five. This result indicates that there is no statistically significant relationship between the gender and status. It means age is not dependent on ones gender.

8.2.3 Testing hypothesis

8.2.3.1 Relationship between age and desire to buy wine online

H₀: $\pi = \pi_0$

H₀: Age is dependent on desire.

H_A: Age is not dependent on desire.

For the data set analysis we use the Chi-square test where all expected frequencies are more than 5, so it means we can use this test. Our calculated $p=0.0001$ value is less than 0.05, we reject our hypothesis, H_A is valid

Table 14: Relationship between age and desire to buy wine online

Relationship between age and desire to buy wine online

The FREQ Procedure

Frequency Percent	Table of age by desire			
	age	desire		Total
		yes	no	
16-24	65 36.31	9 5.03	74 41.34	
25-39	37 20.67	14 7.82	51 28.49	
40-65	23 12.85	14 7.82	37 20.67	
+65	6 3.35	11 6.15	17 9.50	
Total	131 73.18	48 26.82	179 100.00	

Source: Own calculation

Table 15: Statistics for table of age and color of wine

<i>Statistics for Table of age by desire</i>			
Statistic	DF	Value	Prob
Chi-Square	3	22.8341	<.0001
Likelihood Ratio Chi-Square	3	22.2652	<.0001
Mantel-Haenszel Chi-Square	1	21.8907	<.0001
Phi Coefficient		0.3572	
Contingency Coefficient		0.3364	
Cramer's V		0.3572	

Source: Own calculation

8.2.3.2 Relationship between having internet connection and using internet to buy goods online

H₀: $\pi = \pi_0$

H₀: Having internet connection is dependent on having desire to buy goods online.

H_A: Having internet connection is not dependent on having desire to buy goods online.

Table 16: Relationship between having internet connection and using internet to buy goods online

PRE Relationship having internet and buying goods online

The FREQ Procedure

Frequency Percent	Table of internet_connection by buy_goods_onlie			
	internet_connection	buy_goods_onlie		Total
		yes	no	
	yes	69 38.55	36 20.11	105 58.66
	no	48 26.82	26 14.53	74 41.34
Total		117 65.36	62 34.64	179 100.00

Source: Own calculation

When we have contingency table 2x2, we can use two-sample test for analyzing. We calculated and got $u=0.013$. This value is compared with table value $\rightarrow u_{0,05} = 2.003$, So we reject H_0 hypothesis and alternative is valid, because our calculated value is less than table value. It shows that for respondents it doesn't matter they have internet or not. Calculations can be seen in appendix D.

8.2.3.3 The opinion of respondents who live in villages and big cities about security of online payment system

$H_0: \pi = \pi_0$

H_0 : There is no difference between people who live in villages and cities. Both have same opinion about security of online payment system.

H_A : There is difference between people who live in villages and cities. People who live in villages don't think that online payment is secure.

For the data set analysis we use the Chi-square test where all expected frequencies are more than 5, so it means we can use this test. Our calculated $p=0.78$ value is more than 0.05, we can accept our hypothesis, H_0 is valid

Table 17: Relationship between location and security of online payment system

Relationship between respondents from different locations and security of payment system
The FREQ Procedure

Frequency Percent	Table of Location by Security				
	Location	Security			
	Sagree	agree	disagree	Sdisagree	
From-vil	12 6.70	10 5.59	13 7.26	16 8.94	51 28.49
From-cit	17 9.50	11 6.15	10 5.59	4 2.23	42 23.46
From-abr	19 10.61	15 8.38	9 5.03	7 3.91	50 27.93
From-VA	12 6.70	11 6.15	6 3.35	7 3.91	36 20.11
Total	60 33.52	47 26.26	38 21.23	34 18.99	179 100.00

Source: Own calculation

Table 18: Statistics for table of residents and cost of wine

Statistics for Table of Residents by cost_of_wine

Statistic	DF	Value	Prob
Chi-Square	3	1.0851	0.7807
Likelihood Ratio Chi-Square	3	1.0883	0.7799
Mantel-Haenszel Chi-Square	1	0.0023	0.9617
Phi Coefficient		0.0865	
Contingency Coefficient		0.0862	
Cramer's V		0.0865	

Source: Own calculation

8.3. What Georgian wine producers and distributors think about Georgian wine online selling system

8.3.1 Introduction of case study

The purpose of the study was to estimate what Georgian wine producers and distributors think about importance of Georgian online selling system. We also want to investigate, what they think about investing money in internet technologies. Why they don't have online payment system.

There are eleven questions in all to guide us for the study. In all we targeted 300 respondents (wine producers and distributor companies) but had 220 responses. This implies that 220 was our sample size for the study. In the Appendix C of this document are the questionnaires we used for the study. There are 197 wine producers and 23 distributor companies from these 220 respondents. Only 16 wine producer companies have information web sites. 3 distributor companies have web site, one from them have online selling web site without payment system.

8.3.2 Testing hypothesis

8.3.2.1 Relationship between investing money in IT and opinion about increasing sales in wine companies

$H_0: \pi = \pi_0$

H_0 : Majority of companies which are going to invest in internet technologies think that sales will increase.

H_A : Majority of companies which are going to invest in internet technologies think that sales will not increase.

For the data set analysis we use the Chi-square test where all expected frequencies are more than 5, so it means we can use this test. Our calculated $p=0.0001$ value is less than 0.05, we reject our hypothesis, H_A is valid

Table 19: Relationship investing money and opinion of sales increase

Relationship between investing money and opinion
The FREQ Procedure

Frequency Percent	Table of investing_money by opinion_sale_increase					
	investing_money	opinion_sale_increase				Total
		Sagree	agree	disagree	Sdisagre	
Yes	29 13.18	26 11.82	8 3.64	6 2.73	69 31.36	
No	14 6.36	11 5.00	31 14.09	25 11.36	81 36.82	
Not_yet	30 13.64	20 9.09	9 4.09	11 5.00	70 31.82	
Total	73 33.18	57 25.91	48 21.82	42 19.09	220 100.00	

Source: Own calculation

Table 20: Statistics for table of investing money and opinion of sales increase

Statistics for Table of investing_money by opinion_sale_increase

Statistic	DF	Value	Prob
Chi-Square	6	44.5434	<.0001
Likelihood Ratio Chi-Square	6	45.4844	<.0001
Mantel-Haenszel Chi-Square	1	0.5462	0.4599
Phi Coefficient		0.4500	
Contingency Coefficient		0.4103	
Cramer's V		0.3182	

Source: Own calculation

8.3.2.2 The relationship between the reasons why companies don't use online selling system and opinion that it's better to sell wine in shops or markets.

H₀: $\pi = \pi_0$

H₀: Companies which see some problems about selling system think that it's better to sell product in the markets and shops.

H_A: Companies which see some problems about selling system think that it's not necessary to sell product in the markets and shops. It's possible to sell them online.

For the data set analysis we use the Chi-square test where all expected frequencies are more than 5, so it means we can use this test. Our calculated $pr=0.32$ value is more than 0.05, we can accept our hypothesis, H₀ is valid

Table 21: Relationship between the reasons and opinion

Relationship between the reasons why companies don't use online selling system and opinion that it's better to sell wine in shops or marketsn

The FREQ Procedure

Frequency Percent	Table of reason by opinion					
	reason	opinion				Total
		Sagree	agree	disagree	Sdisagre	
	It's_exp	20 9.09	18 8.18	14 6.36	8 3.64	60 27.27
	It's_not	28 12.73	25 11.36	10 4.55	11 5.00	74 33.64
	Old_meth	32 14.55	18 8.18	16 7.27	20 9.09	86 39.09
	Total	80 36.36	61 27.73	40 18.18	39 17.73	220 100.00

Source: Own calculation

Table 22: Statistics for reason and opinion

Statistics for Table of reason by opinion

Statistic	DF	Value	Prob
Chi-Square	6	6.9858	0.3222
Likelihood Ratio Chi-Square	6	7.0190	0.3191
Mantel-Haenszel Chi-Square	1	0.5142	0.4733
Phi Coefficient		0.1782	
Contingency Coefficient		0.1754	
Cramer's V		0.1260	

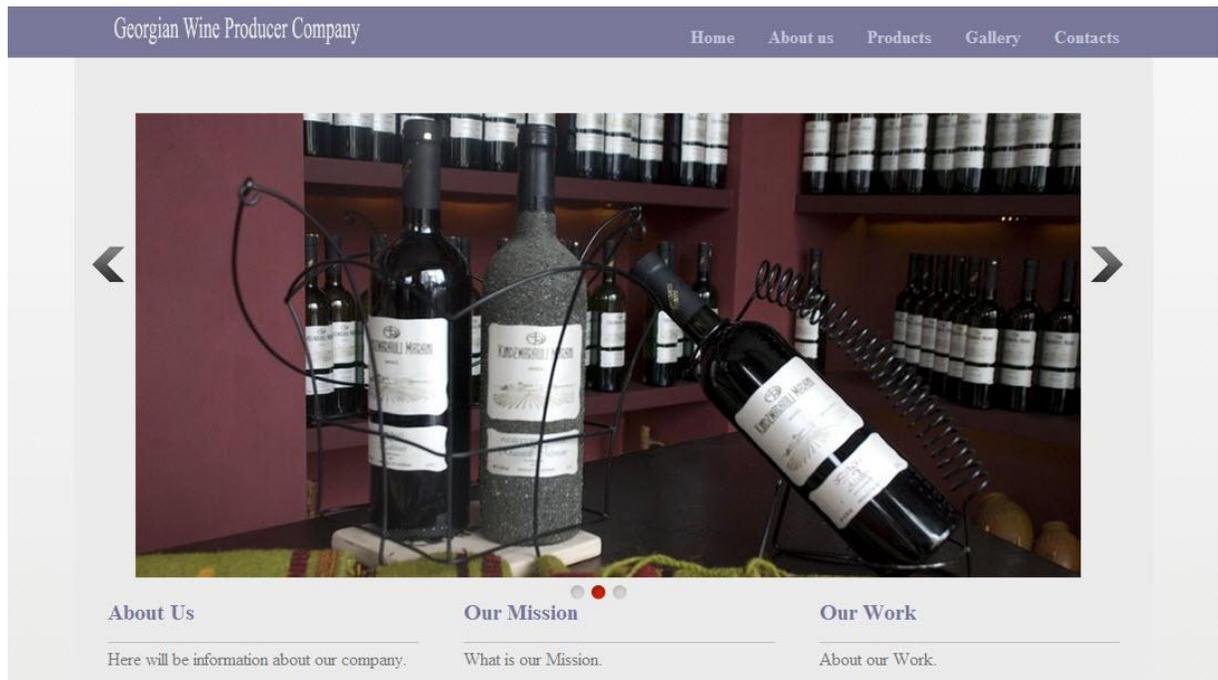
Source: Own calculation

9. The sample web site of Georgian wine producer company.

As it is mentioned above, web sites are very important for companies. In modern world all companies which sell some kind of product have web sites, where you can see product information or buy this product. In this thesis I did sample web site for Georgian wine producer company. I use HTML, XML, CSS and JavaScript technologies for creating our web site.

This web page contains all information about wine company and products. In picture 6 is shown the main page of our web site:

Picture 6: Main page of web site



We can see our web site main page source code in appendix E. This web site is saved on CD disc attached to this thesis in the end.

10. Discussion and results

As Brian C. Satterlee [5] says in his book e-commerce is defined as any transaction over the internet involving transfer of goods, services or information, or it can be any intermediary function that helps enable those transactions. Nowadays in developing countries, there are still problems about confidence of e-commerce systems. In this thesis I introduce recommendations for Georgian wine companies and distributor companies, why they must use internet technologies. I agree to Saumil Shah and Shreeraj Shah [19] that there are many choices to ensure e-commerce system defense: It's possible to use Secure Socket Layer (SSL) to be sure that your information flow between customer and website is secure, also confidential information must be stored in encrypted form.

In my thesis I created the algorithm, which shows us the process, how online selling system works. This system is adjusted for Georgia. In our algorithm we have login process and then wine ordering process with payment. Of course customer must be registered in our system. It is needed to type valid ID and password for logging into system. As we see from diagrams, these processes are easy to use for customers. They need elementary knowledge of computer to use it and buy product online.

As our research shows us, Georgian wine producers have just information web sites, where you can see only product description. There are about 300 wine companies and none of them use internet technologies to sell wine online. In rural areas, for example in Kakheti, the land of wine, where internet technologies and internet connection are not developed, they still use old methods to sell wine. Our recommendation for them will be to create web sites with online payment system. We can offer them system which will be easy to use for customers. There will be choice of payment type: It will be possible to pay using credit card from Georgia and also from abroad. For foreigners there will be PayPal and third type will be virtual account for

Georgian users, which you can charge with pay box machines. These pay box machines are available in developing countries.

Our statistical research confirms all above mentioned problems why e-commerce is not developed among Georgian wine producer companies. From our respondent companies, only 16 companies have information web sites without online selling system. 149 companies are not planning to invest money for creating online selling system. The main reason is that they don't know the importance of this system. They need seminars and trainings to persuade them that in modern era all companies need to have modern systems. From our research we can see that Georgian companies want to use old methods and for them it's better to sell wine in the markets and wine shops.

We can see from our hypothesis that age is not dependant on desire of buying wine online. Everybody wants to buy online, because they don't lose time to go to the shop and it's cheaper. Own research also confirm that everyone wants to buy product online, weather they have internet or not. It's very interesting fact, that customers from villages and cites have same opinion about security of online selling system.

11. Conclusion

From this research, it is proved that e-business and e-commerce are in developing stage. They have many benefits. Better accuracy, high quality of delivering information about products and services are huge advantage for companies. Customers can easily access to web page and see price list of goods or services in unlimited time. It is easy to choose product and order immediately. All orders are listed in the online selling system database. It becomes easier to plan delivery of the product, to choose better route for distribution. Market size is increased, it is possible to sell products and services worldwide. Innovation in electronic delivering of some products and services is one of the best solutions for companies which sell software and have outsourcing services. It means appearance of new distribution channel. These electronic systems decrease administrative tasks and improving strategic thinking.

We made research and discovered that Georgia develops very fast. There are many innovations in information systems. E-government is on a high level. More and more companies appearing which sell product online, but there is still problems in payments. Only one bank provides online payments worldwide via different kind of cards: Visa, MasterCard, Maestro, etc. Many companies introduce new technologies for their business growth.

Research gave us result that Georgian wine companies have great perspectives to change their strategy and create system which will be helpful to sell wine online. Georgian wine is well known in many countries. The mixture of e-business and e-marketing will increase profit for companies. Georgian wine history proves the uniqueness of product.

My thesis introduces recommendations for the Georgian wine producer companies. It confirms that using new technologies and creating online selling system will increase profit for company. System which was designed in this thesis shows that it's very easy to use it. In previous chapter we have description of main aim of thesis in detail. Our statistical research show us that majority of wine producers want to sell wine online and they think that it's secure

to make online payment system, but they still don't want to invest money for making this system. This thesis will persuade them that in modern era they need new global markets to sell wine. Nowadays technologies' developing time is increasing very quickly. It is really revolution in information system. All these technologies are involved in business. This system is customer oriented, which is really useful. Our system helps to improve communication and relationship between company and customer.

Statistical research was made in the thesis. There was done 3 type of questionnaire. In the first one Czech residents were asked, what they thought about Georgian wine and alcohol generally. The hypotheses were tested and all our suppositions were proved. In the second one we had questionnaire about potential customers from Georgia and abroad. There were unexpected facts from customers. In rural areas people think that online selling system is important and secure. We expected that customers who live in the cities are more educated and they know the importance of web sites with e-commerce systems. The third questionnaire was done for Georgian wine producers and distributors. This research proved that all companies want to have web sites and online selling system, but they are not ready to pay for it. We introduced recommendations for companies, which confirm the importance of online selling system.

All above mentioned chapters are the recommendations and confirmations for companies and customers. Easy communication will be guarantee of business success.

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Appendices

(A) Total amount of status and gender

Relationship between Gender and Status

The FREQ Procedure

Table of Gender by Status					
Gender	Status				Total
	Student	Employed	Unemploy	Senior	
Male	31 21.38	17 11.72	14 9.66	9 6.21	71 48.97
Female	28 19.31	19 13.10	16 11.03	11 7.59	74 51.03
Total	59 40.69	36 24.83	30 20.69	20 13.79	145 100.00

(B) Total amount of age and Gender

The FREQ Procedure

Gender	age				Total
	16-24	25-39	40-65	65+	
Male	38 21.23	29 16.20	21 11.73	8 4.47	96 53.63
Female	36 20.11	22 12.29	16 8.94	9 5.03	83 46.37
Total	74 41.34	51 28.49	37 20.67	17 9.50	179 100.00

$$u = \frac{f_1 - f_2}{\sqrt{\frac{p \cdot q}{n}}} = 0.013$$

(E) Source code of the sample web site main page of Georgian wine producer company

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<title>Main. Georgian Wine</title>
<link href="styles/style.css" rel="stylesheet" />

<script type="text/javascript" src="script/js1.js"></script>
<script type="text/javascript" src="script/js2.js"></script>

</head>

<body>
  <div class="whole">
    <div class="whole_header">
      <div class="header">
        <div class="surati">
          
        </div>
        <div class="menu">
          <ul>
            <li><a href="contacts.html">Contacts</a></li>
            <li><a href="galery.html">Gallery</a></li>
```

```

        <li><a href="products.html">Products</a></li>
        <li><a href="about.html">About us</a></li>
        <li><a href="index.html">Home</a></li>
    </ul>
</div>
</div>
</div>
<div class="whole_content">
    <div class="content">
        <div class="bovshis_surati">

```

Here we use JavaScript for making gallery of wine:

```

<div id="gallery">
    <ul class="switcher">
        <li class="active"><a href="#">1</a></li>
        <li><a href="#">2</a></li>
        <li><a href="#">3</a></li>
    </ul>
    <a href="#" class="link-prev">prev</a>
    <div class="holder">
        <ul>
            <li>
                
                <div class="btn-holder"></div>
                <a href="#"
class="logo">coucou</a>
            </li>

```

```

</li>

<a href="#"
class="logo">coucou</a>
</li>
<li>

<a href="#" class="logo
logo1">coucou</a>
</li>
</ul>
</div>
<a href="#" class="link-next">next</a>
</div>
</div>

```

(F) Questionnaire for Czech residents

TOPIC: What Czech residents think about Georgian wine.

This is a survey conducted by Informatics student. Please do NOT write your name on the questionnaire as this study is anonymous. Do not feel obligated to answer all questions if you are uncomfortable or unable to do so. Thank you very much for taking the time to complete our questionnaire, your effort is greatly appreciated.

1. Which is your favorite drink?

Wine -----1

Vodka -----2

Beer -----3

Other drinks-----4

2. How much beer do you drink?

1 liter -----1

1-2 liter-----2

2-4 liter-----3

More than 4 -----4

3. How much wine do you drink?

1 glass-----1

3 glasses----- 2

More than 3 glasses-----3

More than 1 liter ----- 4

4. How often do you drink alcohol?

1 times a month -----1

1 times a week -----2

More than 1 times in a week. -----3

5. Which kind of wine do you like?

Red ----- 1

White -----2

Pink -----3

6. Red wine is more delicious than white wine.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

7. Georgian wine is expensive.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

8. Online Georgian wine selling website will be perfect.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

9. I prefer to buy Georgian wine in the wine shop.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

10. Rate Georgian wine quality and taste.

Poor----- 1
Fair----- 2
Good----- 3
Excellent ----- 4

11. Georgian wine is famous in the world.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

12. Who are you?

Student -----1
Employed -----2
Unemployed -----3

Senior -----4

13. Gender

Male Female

14. How old are you?

.....

15. Which zone are you from?

EU-----1

Non EU-----2

16. Which country are you from?

Russia ----- 1

Ukraine ----- 2

Poland-----3

Kazakhstan ----- 4

Czech Republic -----5

Georgia -----6

Other countries ----- 7

(G) Questionnaire for potential buyers in home and abroad.

TOPIC: What potential buyers in home and abroad think about Georgian wine.

This is a survey conducted by Informatics student. Please do NOT write your name on the questionnaire as this study is anonymous. Do not feel obligated to answer all questions if you are uncomfortable or unable to do so. Thank you very much for taking the time to complete our questionnaire, your effort is greatly appreciated.

1. How old are you?

16-24 -----1

25-39 -----2

40-65 -----3

65+-----4

2. Where are you from?

From village (Georgia) -----1

From city (Georgia) -----2

From abroad (not from Georgia) -----3

From village (abroad, not from Georgia) -----4

3. Do you have internet connection at home?

Yes -----1

No ----- 2

4. Do you use internet to buy goods online?

Yes -----1

No -----2

5. Do you want to buy wine online?

Yes ----- 1

No -----2

6. If you have internet connection, you will buy wine online.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

7. Buying Georgian wine online is cheaper and you don't lose time to go to the shop.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

8. Online payment is secure.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

9. I prefer to buy Georgian wine in the wine shop(not online).

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

10. You want to buy wine online because it is.....

Cheap----- 1

Easy to buy----- 2

11. Georgian wine is famous in the world.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

12. I am

- Student -----1
- Employed -----2
- Unemployed -----3
- Senior -----4

13. Gender

Male Female

14. Which zone are you from?

- EU-----1
- Non EU-----2

15. Which country are you from?

- Russia ----- 1
- Ukraine ----- 2
- Poland-----3
- Kazakhstan ----- 4
- Czech Republic -----5
- Georgia -----6
- Other countries ----- 7

(H) Questionnaire for Wine producers and distributor companies

TOPIC: The opinion of wine producers and distributors about Georgian wine online selling system.

This is a survey conducted by Informatics student. Please do NOT write your name on the questionnaire as this study is anonymous. Do not feel obligated to answer all questions if you are uncomfortable or unable to do so. Thank you very much for taking the time to complete our questionnaire, your effort is greatly appreciated.

1. What kind of company are you?

Georgian wine producer -----1

Georgian wine distributor company -----2

2. Does your company have web site?

Yes -----1

No-----2

3. Are you planning to make web site with online payment system?

Yes-----1

No----- 2

Maybe-----3

4. Are you planning to invest in developing of internet technologies to increase sales?

Yes -----1

No -----2

Not yet (maybe in the future) -----3

5. Why don't you use internet technologies to sell product online?

It's expensive ----- 1

It's not secure-----2

Old methods are better -----3

6. Georgian wine online selling system will increase sales.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

7. It will be easier to find global markets using online selling system.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

8. Wine is not product which can be sold online.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

9. It's better to sell Georgian wine in the wine shops and supermarkets.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree

10. Rate Georgian wine quality and taste.

Poor----- 1

Fair----- 2

Good----- 3

Excellent ----- 4

11. Georgian wine will be more famous in the world, if company uses internet technologies.

1. Strongly Agree 2. Agree 3. Disagree 4. Strongly Disagree