Calculation of investments for the distribution of gpon technology in the village of Bishtazhin through database

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Abstract

According to daily reports, the income from internet services is getting lower each year. Landline phone services are running at a loss, whereas mobile phone services are getting too mainstream and the only bright spot holding together cable operators (ISP) in positive balance is the income from broadband services (Fast internet, IPTV).

Broadband technology is a term that defines multiple methods of information distribution through internet at great speed. Some of the broadband technologies are: optic fiber, coaxial cable, DSL, Wireless, mobile broadband, and satellite connection. The ultimate goal of any broadband service provider is being able to provide voice, data and the video through a single network, called triple play service.

The Internet distribution remains an important issue in Kosovo and particularly in rural zones.

Considering the immense development of the technologies and different alternatives that we can face, the goal of this paper is to emphasize the necessity of a forecasting of such investment and to give an experience in this aspect. Because of the fact that in this investment are involved many factors related to population, geographical factors, several technologies and the fact that these factors are in continuously change, the best way is, to store all the data in a database and to use this database for different results. This database helps us to substitute the previous manual calculations with an automatic procedure of calculations.

This way of work will improve the work style, having now all the tools to take the right decision about an Internet investment considering all the aspects of this investment.

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Key words: broadband technology, triple play, database, return of investment, accounting, etc.

1.   Introduction

For the activity of a company, it is important to store somewhere all of its business activities and transactions. That place where activities and data should be stored is called the database. Another "language" for creating databases is also the, which is based as e in mathematical theories and consists of such elements as: insert, update, delete, query, etc. (Taylor, 2003).

To create a database one can also use the application program package Office, Access which is a program for managing information from a simple address list up to a complex inventory management (Andersen, 2004). Access can be used in all private firms, in educational institutions, health institutions, in administrative offices , in post offices, banks, tax offices, register offices, in goods' storages, in trading, craft firms etc. (Skenderi and Skenderi, 2002).

The database is organized in a way that all calculations done manually from previous chapter, now can be calculated automatically through it. Just like any other project, ours that has to do with the extension of broadband technology in rural area, should have the time to calculate the return on investment by months but by percentage. To calculate the return on investments one should build financial statements. Their construction will be done through accounting rules, through tables and through the database, automatically.

2. Organizing the data in the database

Our database is constructed as you can see below.

Figure 1: Created database
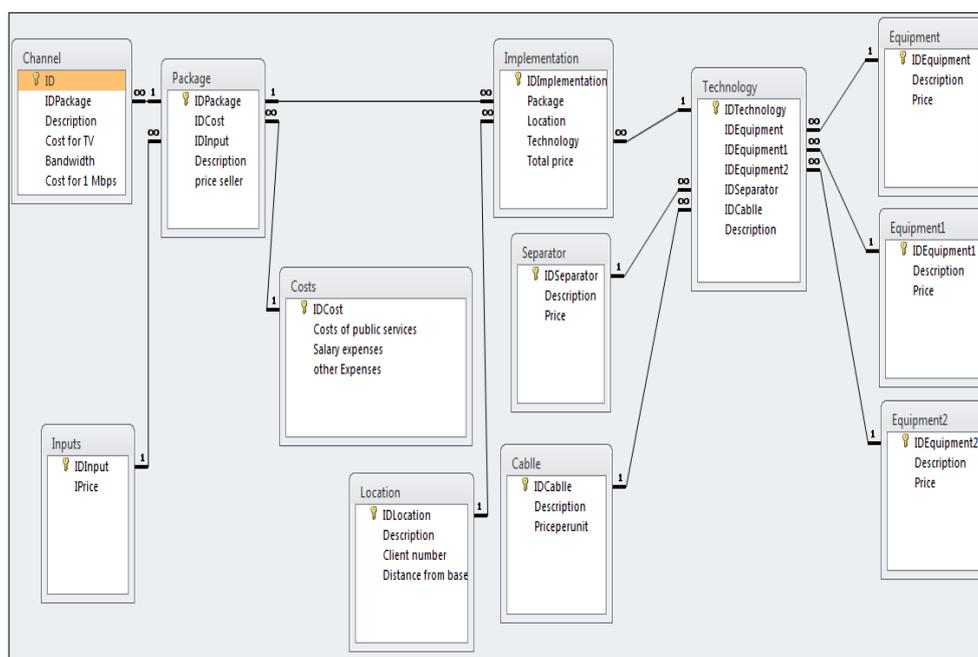
Source: Author's own calculations

Our database consists of twelve entities (which you can see from the picture above, and where are also given each of their fields).
Entities are as it follows:
- Channel
- Other inputs
- Package
- Costs
- Location
- Implementation
- Separator
- Cable
- Technology
- Equipment

- Equipment1
- Equipment2

Entities are a group of events, people, places, or other things that are used to show how data is stored (Allison and Berkowitz, 2005).

Attributes of entities are:

i. Channel (ID, Description, Cost per TV, Bandwidth, Cost per 1 Mbps)
ii. Other inputs (IDInput, Input price)
iii. Package (IDPackage, Description, Price seller)
iv. Costs (IDCost, Cost of public services, Salary expenses, Other expenses)
v. Location (IDLocation, Description, Client number, Distance from base)
vi. Implementation (IDImplementation, Package, Location, Technology, Total price)
vii. Separator (IDSeparator, Description, Price)
viii. Cable (IDCable, Description, Priceperunit)
ix. Technology (IDTechnology, Description)
x. Equipment (IDEquipment, Description, Price)
xi. Equipment 1 (IDEquipment1, Description, Price)
xii. Equipment 2 (IDEquipment2, Description, Price)

Attributes are the characteristics of one entity (Allison and Berkowitz, 2005).

The main keys are:

i. ID
ii. IDInput
iii. IDPackage
iv. IDCost
v. IDLocation
vi. IDImplementation
vii. IDSeparator
viii. IDCable
ix. IDTechnology
x. IDEquipment
xi. IDEquipment1
xii. IDEquipment2

In each new table we create it will be necessary to assign a field as a primary key. Access uses this field to connect the registrations of a table with the records of other tables, and also in the cases when there are thousands of

future files in the database and only one is required, the main key speeds up the data finding (Dragusha, 2003).

1. *Transfer of entities in relations by inserting the secondary keys* (Andersen, 2004)
   i.   Channel (ID, IDPackage, Description, Cost per TV, Bandwidth, Cost per 1 Mbps)
   ii.   Other inputs (IDInput, Input price)
   iii.   Package (IDPackage, IDCost, IDInput, Description, Price seller)
   iv.   Costs (IDCost, Cost of public services, Salary expenses, Other expenses)
   v.   Location (IDLocation, Description, Client number, Distance from base)
   vi.   Implementation (IDImplementation, Package, Location, Technology, Total price)
   vii.   Separator (IDSeparator, Description, Price)
   viii. Cable (IDCablle, Description, Priceperunit)
   ix.   Technology (IDTechnology, IDEquipment, IDEquipment1, IDEquipment2, IDSeparator, IDCable, Description)
   x.   Equipment (IDEquipment, Description, Price)
   xi.   Equipment1 (IDEquipment1, Description, Price)
   xii.   Equipment2 (IDEquipment2, Description, Price)

Secondary keys connect the records (rows) of a table with other table's records (Andersen, 2004).

2.1. Analyzing the database

We mentioned above that the database consists of twelve tables (the table is the basic unit of the database and the place where the data is set. It consists of records and fields) (Rexhepi, 2002),   and as a main table is the "Implementation" table . On its left are the tables "Channel", "Other inputs", "Package", "Costs" which help us calculate profits and investment return for each package that is offered by the service provider (television and internet), whereas on the right side are the tables "Location"; "Separator"; "Cable"; "Technology; "Equipment"; "Equipment1"; "Equipment2"; and that concern the calculation of the investment sum (for three technologies), for the distribution of broadband technology in rural areas. Let us analyze the tables .

The table "Channel" consists of five fields: ID, IDPackage, Description, Cost per TV, Bandwidth, and Cost per 1 Mbps. This table in the design form looks like this (Rexhepi, 2002).

Figure 2: The table "Channel" in the design form

Channel	
Field Name	**Data Type**
ID	Number
IDPackage	Number
Description	Text
Cost per TV	Currency
Bandwidth	Number
Cost per 1 Mbps	Currency

Source: Author's own calculations

Whereas the table we see above in the tabular form (Rexhepi, 2002) and filled with data looks as it follows:

Figure 3: The table "Channel" in the tabular

ID	IDPackage	Description	Cost per TV	Bandwidth	Cost per 1 Mbps	Click
1	101	DigitAlb	€4.00	2560	€15.00	
2	122	DigitAlb me sport	€7.33	2560	€15.00	
3	103	Tring	€1.50	2560	€15.00	
4	124	Tring me sport	€3.00	2560	€15.00	
11	305	DigitAlb	€4.00	2560	€6.00	
21	326	DigitAlb me sport	€7.33	2560	€6.00	
31	307	Tring	€1.50	2560	€6.00	
41	328	Tring me sport	€3.00	2560	€6.00	

Source:Author's own calculations

The table "Other inputs" consists of two fields (the tables save information in fields that contain different information for one subject) (Viescas, 2004): *IDInput*, *Input price*. This table in the design form looks as it follows.

Figure 4: The table "Inputs" in the design form

Inputs	
Field Name	**Data Type**
IDInput	Number
IPrice	Currency

Source:Author's own calculations

The structure of the table above contains, inter alia, contains setting fields in the Field Name column and determining the data type for each field in the Data Type column (Skenderi and Skenderi, 2002).
The table above in the tabular form is presented below.

Figure 5: The table "Inputs" in the tabular form

Inputs		
IDInput ▾	**IPrice** ▾	Cl
500	€2,000.00	
*		

Source:Author's own calculations

The table "Package" has five fields: IDPackage, IDCost, IDInput, Description, and Price seller. In the designing form you can see the picture down below.

Figure 6: The table "Package" in the design form

Package	
Field Name	**Data Type**
🔑 IDPackage	Number
IDCost	Number
IDInput	Number
Description	Text
Price seller	Currency

Source:Author's own calculations

Where as in the tabular form, and filled with data looks:

Figure 7: The table "Package" in the tabular

Package					
IDPackage ▾	IDCost ▾	IDInput ▾	Description ▾	Price seller ▾	Cl
101	300	500	Paketa 1	€15.00	
103	300	500	Paketa 3	€15.00	
122	300	500	Paketa 2	€20.00	
124	300	500	Paketa 4	€20.00	
305	300	500	Paketa 5	€15.00	
307	300	500	Paketa 7	€15.00	
326	300	500	Paketa 6	€20.00	
328	300	500	Paketa 8	€20.00	

Source:Author's own calculations

The table "Costs" has four fields which are: IDCost, Cost of public services, Salary expenses, Other expenses. This table is connected in the relation one with many with the table "Package". This means that each package has one expense. This table is about calculating the profit and the return on investments that the firm will pull off from the realization of the investing project. This table in the design form looks like pictured below.

Figure 8: The table "Costs" in the design form

Costs		
Field Name	**Data Type**	
🔑 IDCost	Number	
Costs of public services	Currency	
Salary expenses	Currency	
Other Expenses	Currency	

Source:Author's own calculations

In the tabular form it would look like this.

Figure 9: The table "Costs" in the

Costs				
IDCost ▾	Costs of public services ▾	Salary exper ▾	Other Expenses ▾	C
300	€650.00	€5,500.00	€500.00	

Source:Author's own calculations

The table "Location" has four fields which are: IDLocation, Description, Client number, Distance from base. This table is in relation one with many with the table "Implementation", which makes us understand that one place occurs in many implementations.

Figure 10: The table "Location" in the design form

Location		
Field Name	**Data Type**	
🔑 IDLocation	Number	
Description	Text	
Client number	Number	
Distance from base	Number	

Source:Author's own calculations

And the tabular form looks like pictured below.

Figure 11: The table "Location" in the tabular form

Location				
IDLocation ▾	Description ▾	Client numb ▾	Distance from base ▾	C
4000	Bishtazhin	5000	30000	
4001	Smaç	4000	12000	
4002	Demjan	3000	20000	
4003	Has	1000	15000	
4004	Xërxë	2000	10000	
4005	Rogovë	1000	15000	

Source:Author's own calculations

The table "Equipment" has three fields: IDEquipment, Description, and Price. This table in the design form looks:

Figure 12: The table "Equipment" in the design form

Equipment	
Field Name	**Data Type**
IDEquipment	Number
Description	Text
Price	Currency

Source:Author's own calculations

Whereas the tabular form looks like this:

Figure 13: The table "Equipment" in the tabular form

	IDEquipmen ▾	Description ▾	Price ▾	Clic
⊞	1000	OLTsh	€8,000.00	
⊞	1001	OLTp	€10,000.00	
⊞	1002	Dslam	€1,000.00	
✳				

Source:Author's own calculations

The table "Equipment1" also has three fields which are: IDEquipment1, Description, and Price. In this table we put another device which is needed to make the technology work. This ONT equipment which we did describe in the last chapter is put on the client's side and has the role of the modem. Its design form looks like below.

Figure 14: The table "Equipment1" in the design form

Equipment1	
Field Name	**Data Type**
IDEquipment1	Number
Description	Text
Price	Currency

Source:Author's own calculations

From the picture above we can see that the equipment's ID (IDEquipment1) starts from the number 2000. We can also see that this equipment has two prices. You can see it down below in the tabular form.

Figure 15: The table "Equipment1" in the tabular form

Source:Author's own calculations

The table "Equipment2" also has three fields which are: IDEquipment2, Description, and Price. Also in this table we continue putting equipments and their prices which are needed for the operation of relevant technologies (in this case GPON).

Figure 16: The table "Equipment2" in the design form

Source:Author's own calculations

In the tabular form it looks like this.

Figure 17: The table "Equipment2" in the tabular form

Source:Author's own calculations

The table "Separator" also has three fields which are: *IDSeparator*, *Description*, and *Price*. Here we are dealing with placing several dividers. 64 Divider (yarn fibers) and 8 Divider (yarn fibers) with wholesale and retail prices. First off, let's take a look of this table in the designing form.

Figure 18: The table "Separator" in the design form
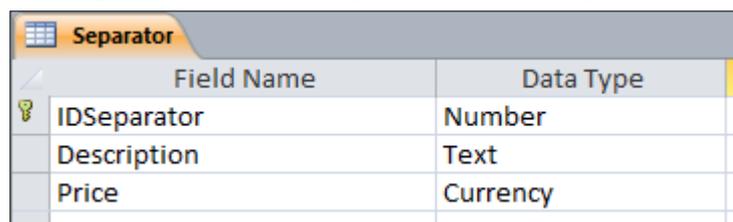
Field Name	Data Type
IDSeparator	Number
Description	Text
Price	Currency

Source:Author's own calculations

Whereas in the design form it looks like you can see below.

Figure 19: The table "Separator" in the tabular form
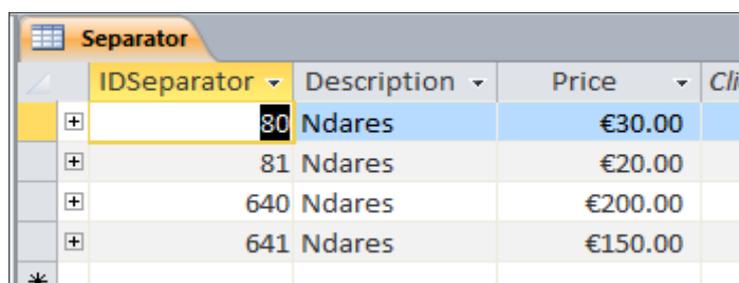
IDSeparator	Description	Price	Clie
80	Ndares	€30.00	
81	Ndares	€20.00	
640	Ndares	€200.00	
641	Ndares	€150.00	

Source:Author's own calculations

The picture below tells us that the first implementation (IDImplementation1) has used the ID11 technology, the package with ID 101 (Tv channels of the company *DigitAlb* without the sport channels) and has implemented them in the place with ID4000 (Bishtazhin with 5000 clients and a distance of 30.000 meters from the base) with a total costing price from € 283.50. How was this total € 283.50 price formed? This price is formed by adding the sum invested for one client (depending on the number of the clients and the client's distance from the base) and the package which is delivered to the client (depending on which company we put on the package *DigitAlb* or *Tring*, and with sport channels or without sport channels) . At the third implementation (IDImplementation 3) we can see that the total costing price for a client is € 256.50. Why the total price here is cheaper than the price in the implementation with the ID number 1? This is because that the implementation with the ID number 3 is implemented in the place with the ID number (Smaç with 4000

clients and a distance from 12.000 meters from the base), which has 1000 clients less and is 18.000 meters closer to the base. Implementation with the number 4 of the ID is put at the place with the ID number (Demjan with 3000 clients, and 20.000 meters away from the base). In this implementation we used the technology with the number ID14, whereas the implemented placed has the number 124 (TV channels of the *Tring* company with the sports channels as well).

Figure 20: The table "Separator" with sub tables

Source:Author's own calculations

The table "Cable" like most of the other tables has three fields which are; *IDCable* (primary key), *Description*, and *Priceperunit*. The field *IDCable* has the number which symbolizes the cable with the fiber threads (the field *Description*)with a price € 9 (the field *Priceperunit*), whereas the number 112 symbolizes the cable with fiber threads too, with a price of € 10 (for a smaller amount of work)

Figure 21: The table "Cable" in the design form
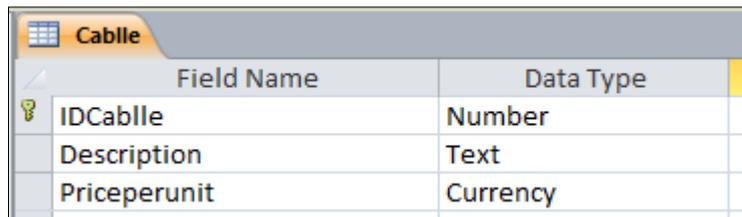
Cablle	
Field Name	Data Type
IDCablle	Number
Description	Text
Priceperunit	Currency

Source:Author's own calculations

The table "Implementation" has five fields which are: IDImplementation, Package, Location, Technology, Total price. The field *IDImplementation* is the main key, whereas the fields *Package*, *Location*, and *Technology* are secondary keys. This table is a summary of the analysis, calculations and adjustments, from other tables which have a key focus on implementing any project. This table creates relation many with one with the "Package" through the fields *Package – IDPackage* (The data type of the both fields is Number) (Van Der Lans,2006), the relation many with one with the table "Location" through the fields *Location – IDLocation*, and relation many with one with the table "Technology" through the fields *Technology – IDTechnology*. This table in the tabular form looks like you can see down below.

Figure 22: The table "Implementation" in the tabular
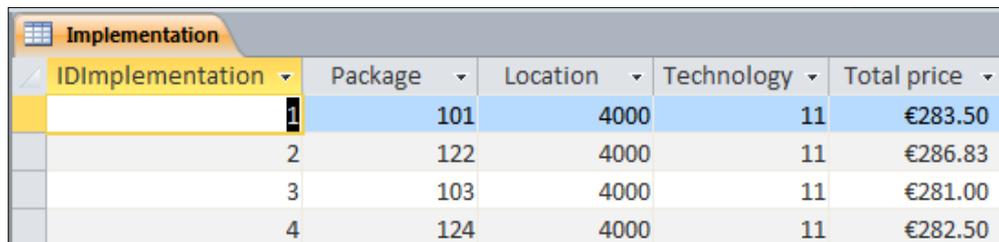
Implementation				
IDImplementation ▾	Package ▾	Location ▾	Technology ▾	Total price ▾
1	101	4000	11	€283.50
2	122	4000	11	€286.83
3	103	4000	11	€281.00
4	124	4000	11	€282.50

Source:Author's own calculations

From the table above we can see that four implementations have been made with ID 1, 2, 3 and 4.From the picture above we can see that the in first implementation we use the package ID101 (The TV channels of DigitAlb

company, without sports channels) in the place with ID number 4000 (Bishtazhin) technology with the ID number 11 has been implemented (the content of this technology has been shown above in the "Technology" table) so the total price for this implementation is € 283.5. The second implementation implements the package with the ID number 101 in the same spot, that is to say with the ID 4000 but through the ID12 technology, in which case the total price is shown on *Total price* field and is € 334.5. The third implementation also implements the ID101 package in the ID4001 place (The rural area called Smaç) while applying the ID13 technology, in which case the total costing price for one client in that area is € 256.5. Whereas the fourth implementation (ID with the number 4) implements the package with the ID124 (it includes the TV channels of *Tring* company with the sports channels), in the ID4002 place (rural area called Demjan) through the execution of the 14 , in which case we get the total costing price for a client which € 288.5. What we showed here we can easily see in the "Technology" table. The value of the field *Total price* is obtained by either manual calculations or through the computer by the database queries constructed above. This value which comes out from the adding of the costing price for a client and the costing price for a bid package (101, 122, 103, 124, 305, 326, 307, or 328).

3. **Calculation of the amount invested on and the return on investment through database**

The sum that needs to be invested and the return on investments through the database are performed through the object of the query (Grup autorësh, 2005). A query is a group of instructions, through which, assigned records are submitted in a special window, or can perform any actions on those records. When the investing firm looks at the decisions of the investing capital, it does not take into account that it is dealing with the perfect market, the competition. It might have only a few competitors which are specialized in that particular business geographic area and it might have some unique assets (wealth) that will offer a priority towards other competitors (Luboteni, 2007).

3.1. Calculation of the invested amount
In the previous chapter we have manually done multiple times the invested sum. Now we will do this through the queries of the database. The fields which will be used for creating the query "Invested total" will be: Technology.Description,   Equipment.Description,   Equipment.Price, Equipment1.Description,Equipment1.Price,   Equipment2.Description, Equipment2.Price, Separator.Description, Separator.Price, Cable.Description, Cablle.Priceperunit, Location.Client number, Location.Distance from base (the

name in front of the dot tells the name of the table, whereas the name after the dot, tells the name of the field). The formula which helps us calculate based on the parameters above is

*Invested total: ([Client number] / 512) * [Equipment.Price] + [Client number] * [Equipment1.Price] + [Client number] * [Equipment2.Price] + [Distance from base] * [Priceperunit] + (([Client number] / 512) * 8) * [Separator.Price]*

3.2. Investment on a customer

To calculate the investment on a customer, then we use the fields and the calculations of the above query. The fields that we will use to create the "*Investment per Client*" query are these : *Technology.Description, Invested total, Client number,*and *Investment per Client*. The last field *Investment per Client* is calculated by the prior query "Invested total" like you can see down below:

Investment per Client: [Invested Total] / [client number]

Or:

Investment per Client: (([Client number] / 512) * [Equipment.Price] + [Client number] * [Equipment1.Price] + [Client number] * [Equipment2.Price] + [Distance from base] * [Priceperunit] + (([Client number] / 512) * 8) * [Separator.Price]) / [Client number]

3.3. Estimating the amount invested in other technologies (dsl)

If we want to use other technologies instead of *gpon*, i.e. the technology *dsl* then we add a few equipment in the tables , "Equipment" (new code records are added in the field *IDEquipment* 1002 and 1003), "Equipment1" (new code records are added in the field *IDEquipment1* 2002 and 2003), "Equipment2" (new code record if added in the field *IDEquipment2* 3002), and "Separator" (new code record if added in the field *IDSeparator* 30).

If we use the new *dsl* technology equipment, then the tables "Technology" and "Implementation" (the other tables will not be affected) will look like you can see below.

Figure 23: Tables "Technology" and "Implementation" in dsl technology

IDTeknologj	IDPajisja	IDPajisja1	IDPajisja2	IDNdarës	IDKablli	Përshkrimi	Click to Add
15	1002	2002	3002	30	111	dslam	
16	1003	2003	3002	30	111	dslam	

IDImplementimi	Paketa	Vendi	Teknologjia	Cmimi total	Click to Add
5	101	4000	15	€249.70	
6	101	4001	16	€230.83	

Source:Author's own calculations

The description of these table records is done above and is the same, except that in the field *Përshkrimi* is the name of the new technology. To calculate the invested sum for this technology then, in the query one must use this formula.

*Invested total: ([Client number] / 896) * [Equipment.Price] + [Client number] * [Equipment1.Price] + [Client number] * [Equipment2.Price] + [Distance from base] * [Priceperunit] + [Separator.Price] * [Client number]*

In the case of gpon technology the used formula was:

*Invested total: ([Client number] / 512) * [Equipment.Price] + [Client number] * [Equipment1.Price] + [Client number] * [Equipment2.Price] + [Distance from base] * [Priceperunit] + (([Client number] / 512) * 8) * [Separator.Price]*

There where the two formulas differ, are underlined

3.4. Calculation on investment return

The company which implements this business (another kind of businesses) is interested on the time of investment return, that is to say that in the optimal offer the return on investment to be as immediate as possible.   To calculate the return on investments (ROI – return of investments) first you have to find out the bruto profit. The bruto profit tells the difference of the general income and the cost (costs are a measurement with monetary terms of the amount of resources used to generate revenue) of the sold services. (Gross profit = Inputs – Cost of sold services). After we find the bruto profit, then we find the profit before the tax. The profit before the tax is calculated as a difference between the gross profit and the costs. (Profit before tax = Gross profit – Costs). Then, the profit before taxes, is multiplied by the value on the tax, then we get the tax. (Tax = Profit before tax * Tax value). Whereas the net profit (net profit is the difference between the profit before the tax, and the tax calculated in this profit). All of these form the statement of income. So, the income statement is financial statement that shows the financial performance of a company in a period of time (monthly, quarterly or yearly) (Asllanaj, 2010). Also it is called a profit statement or a loss statement.

Table1: Income Statement

Monthly Incomes	
1. Inputs	1
2. Cost of services sold	2
I. GROSS PROFIT (1-2)	1 - 2
Public services expences	3
Salary expences	4
Other expences	5
II. EXPENCES	3 + 4 + 5
III. PROFIT BEFORE TAX (I-II)	(1 – 2) – (3 + 4 + 5)
Tax 20 %	((1 – 2) – (3 + 4 + 5)) * 0.2
IV. NET PROFIT (III-Tax)	((1 – 2) – (3 + 4 + 5)) – (((1 – 2) – (3 + 4 + 5)) * 0.2)

First off, we have to say, that a business is effective and efficient only if it is successful in offering the goods and services required by clients, and if it keeps their costs lower than the prices of their sale (Ingram, Albright and Baldwin, 2005).

After all of these are calculated then we can find the return of investments, which can be found through this formula.

$$Investment\ return\ (ROI) = \frac{profit}{invested\ total} * 100\ \%$$

The formula you can see above presents the return of investments according to percentage, whereas the formula of the return of investments according to months is below:

$$Invesment\ return\ (ROI) = \frac{invested\ total}{profit}$$

Now we will find return of investments according to the offered packages (Package 1 –Package 8) in an automatic way through the queries of the database. From the table above we can see that first we have to find the revenues and the cost of sold services. First we create the table "Implementation" with the data that you can see below.

Figure 24: The table "Implementation" in the tabular form

Implementation				
IDImplementation ▾	Package ▾	Location ▾	Technology ▾	Total price ▾
1	101	4000	11	€283.50
2	122	4000	11	€286.83
3	103	4000	11	€281.00
4	124	4000	11	€282.50
5	305	4000	11	€279.00
6	326	4000	11	€282.33
7	307	4000	11	€276.50
8	328	4000	11	€278.00

Source:Author's own calculations

In the table above we have made eight implementation for eight packages in the same place (code 4000- place Bishtazhin) with the same technology (11). In the field *Total price* are given the costing prices for each package. After the table is filled with the data we need, we can find the return on investments. We showed above that to fund the return of investments we first need to find the revenue and the cost of sold services.

3.5. Calculating the revenue and the costs

In the query below "Revenue and the costs" we have found from the calculations the revenue and the cost of the sold services projected in each package. Such query has the fields: Package.Description, Channel.Description, Cost per TV, Bandwidth, Cost per 1 Mbps, Price seller, Input price, Client number, Cost of services sold, Costs, Other inputs, and Inputs.

Field *Package.Description* (*Package* is the table whereas *Description* is a field of that table), it has the description of the packages that are offered by the firm (provider) . The field Channel.Description describes the TV channels of the packages of the previous fields. The field *Cost per TV* shows what the cost for offered TV channels is for the service provider. Then we have the field *Bandwidth* and the field *Cost per 1 Mbps*. The field *Price seller* shows the price of sale for the offered packages. In the offering package, we can place also commercial TV channels which pay a price to be put on tha package. The field *Input price* shows the price which needs to be paid for those channels to the broadband service provider. The number of clients is put in the field *Client*

number. Whereas the field Cost of sold services is calculated with the following formula:

*Cost of sold services: [Client number] * [Cost per TV] + [Bandwidth] * [Cost per 1 Mbps]*

The field *Costs* adds three kinds of costs which happen during the activity of an enterprise. The formula is below.

Costs: [Cost of public services] + [Salary expenses] + [Other expenses]

We showed above that in the offered packages we can put others channels which are self-offered. Than its setting in the package will be done through the field *Other inputs*. Here is the formula:

*Other inputs: 10 * [Input price]*

Number 10 in the formula above tells that there are 10 other TV channels placed in the package and that each of them has to pay the provider the price of € 2000. The latest field of this query is the field *Te hyrat*, which is formed by the formula below:

*Inputs: [Client number] * [Price seller] + 10 * [Input price]*

So we get the income from multiplying the number of clients with the costing price of the plus package from multiplying 10 other channels that are put in the package.

3.6. Calculating the neto profit

The fields which help us create the query *net profit* are these: Package.Description, Channel.Description, Inputs, Cost of services sold, Gross profit, Costs, Profit before tax, Tax, and Net profit.

The field *Package.Description* (Package is the name of the table, whereas Description is the name of the field) it presents the description of offering packages, whereas the field *Channel.Description* describes that the channels of which company have the offered packages. Fields *Inputs* and *Costs of sold services* are calculated in the previous query "Revenue and the costs" whereas the next field *Gross profit* as we have told previously is obtained as a difference of the fields *Inputs* and *Costs of sold services.* See the formula below.

Gross Profit: [inputs] – [Cost of services sold]

Where, from the previous query:

*Inputs: [Client number] * [Price seller] + 10 * [Input price]*
*Cost of sold services: [Client number] * [Cost per TV] + [Bandwidth] * [Cost per 1 Mbps]*

The field *Costs* is established after the infrastructure arises for the commecement of preparation and the company starts its activity. Namely, this sums up some operating expenses (operating expenses are those expenses which are crated when the enterprise starts the production or serving process) and which are: Cost of public services, Salary expenses, and Other expenses. The next field is *Profit Before Tax* which is made when we subtract the cost from the bruto profit. See the formula below.

Profit Before Tax: [Gross Profit] – [Costs]
*Gross profit: (([Client number] * [Price seller] + 10 * [Input price]) - ([Client number]*
*[Cost per TV] + [Bandwidth] * [Cost per 1 Mbps]))*
Costs: ([Cost of public services] + [Salary expenses] + [Other expenses])

The next field is the field *Tax* which we obtain when the field *Profit Before Tax* is multiplied by the value of the tax. Below you can see how we have calculated the tax from the profit before tax, if the value of the tax is 20 %. Look at the formula below.

*Tax: 0.2 * (((([Client number] * [Price seller] + 10 * [Input price]) - ([Client number] **
*[Cost per TV] + [Bandwidth] * [Cost per 1 Mbps])) - ([Cost of public services] +*
[Salary expenses] + [Other expenses]))

And the last field and our goal is the field *Net profit* which is obtained if from the field *Profit Before Tax* we subtract the calculated tax on it. You can see the formula below:

Net profit: [Profit Before Tax] – [Tax]
Or:
*Net profit: (([Client number] * [Price seller] + 10 * [Input price]) - ([Client number] **
*[Cost per TV] + [Bandwidth] * [Cost per 1 Mbps])) - ([Cost of public services] +*
*[Salary expenses] + [Other expenses]) - (0.2 * (((([Client number] * [Price seller] + 10 **
*[Input price]) - ([Client number] * [Cost per TV] + [Bandwidth] * [Cost per 1 Mbps]))*
- ([Cost of public services] + [Salary expenses] + [Other expenses])))

3.7. Calculating the investment on a client

After we have calculated the revenue, costs of sold services, gross profit, profit before tax, tax, and net profit we have to figure out what is the investment for a client for the highest packages in the place which has 5000 clients and it is 30.000 meters from the base of the provider. The new query is named "*Investment per Client*" and it has these fields: *Technology.Description*, *Invested total*, *Client number,*and *Investment per Client*. All the fields are familiar except the field *Investment per Client*.

From the table of the query we can see that all the fields under the *Invested total* have the same value. This is the same for the field *Investment per Client*!

This happens because the investment on the expansion of the broadband technology is separated from the price of the package. From the picture above we can see that for all the package the used technology is gpon, and also this is amount is calculated for a same number of clients (5000), and investment is necessarily the same for every client. Once again we will write down the formula for the calculation of the amount invested.

Invested total: ([Client number] / 512) * [Equipment.Price] + [Client number] * [Equipment1.Price] + [Client number] * [Equipment2.Price] + [Distance from base] * [Priceperunit] + (([Client number] / 512) * 8) * [Separator.Price]

The field *InvestmentPerClient* is calculated as you can see below.

InvestmentPerClient: [Invested Total] / [client number]

Or:

InvestmentPerClient: (([Client number] / 512) * [Equipment.Price] + [Client number] * [Equipment1.Price] + [Client number] * [Equipment2.Price] + [Distance from base] * [PricePerUnit] + (([Client number] / 512) * 8) * [Separator.Price]) / [Client number]

Now, the values obtained in the field *InvestmentPerClient* that is to say € 271.96 = € 272 are added to the value of the costing prices of the offered packages and the field *Total price* is formed which is placed in the table "Implementation". For the first package we have € 272 + € 11.5 = € 283.5, for the second package we have € 272 + € 11.5 + € 3.33 = € 286.83, for the third package we have € 272 + € 9 = € 281, for the fourth € 272 + € 10.5 = € 282.5, for the fifth € 272 + € 7 = € 279, for the sixth€ 272 + € 10.33 = € 282.33, for the seventh € 272 + € 4.5 = € 276.5, and for the eighth € 272 + € 6 = € 278.

3.8. Calculating the return of investment by month

We have now come to the query or "the indicator" of whether it is worth to achieve the anticipated investment! If it is worth it, then we see which of the offers made towards the consumers is the most optimal one, for the client and for the provider as well. The new query is named "return of investment by month" and has these fields: *Package.Description, Channel.Description, Net profit, Invested total,* and *Return of Investment.*

The field *Package.Description* describes the names of the packages offered (packages from 1 to 8). The field *Channel.Description* describes that the channels of which company are in the packages is the field *Package.Description* (Package 1 has the channels of DigitAlb, package 2 has the channels of the DigitAlb with the sports channels, package 3 has the channels of Tring company, whereas the package 4 has the channels of Tring with the sports channels). The package 5, 6, 7 and 8 has the same channels but the costing price for the internet provider is

much cheaper, it is € 9. The field for estimating the neto profit is given above but you can find it in the formula below as well.

*Net profit: ((([Client number] * [Price seller] + 10 * [Input price]) - ([Client number] * [Cost per TV] + [Bandwidth] * [Cost per 1 Mbps])) - ([Cost of public services] + [Salary expenses] + [Other expenses]) - (0.2 * ((([Client number] * [Price seller] + 10 * [Input price]) - ([Client number] * [Cost per TV] + [Bandwidth] * [Cost per 1 Mbps])) - ([Cost of public services] + [Salary expenses] + [Other expenses])))*

The field *Invested total* is also rewritten below:

*Invested total: ([Client number] / 512) * [Equipment.Price] + [Client number] * [Equipment1.Price] + [Client number] * [Equipment2.Price] + [Distance from base] * [PricePerUnit] + (([Client number] / 512) * 8) * [Separator.Price]*

Whereas the field *Return of Investment* is obtained through the formula below:

Return of investment: [Invested Total] / [Net profit]

Or:

*Return of investment: (([Client number] / 512) * [Equipment.Price] + [Client number] * [Equipment1.Price] + [Client number] * [Equipment2.Price] + [Distance from base] * [PricePerUnit] + (([Client number] / 512) * 8) * [Separator.Price]) / ((([Client number] * [Price seller] + 10 * [Input price]) - ([Client number] * [Cost per TV] + [Bandwidth] * [Cost per 1 Mbps])) - ([Cost of public services] + [Salary expenses] + [Other expenses]) - (0.2 * ((([Client number] * [Price seller] + 10 * [Input price]) - ([Client number] * [Cost per TV] + [Bandwidth] * [Cost per 1 Mbps])) - ([Cost of public services] + [Salary expenses] + [Other expenses]))))*

So we can see here that for all the offered packages from the provider, the investment sum is the same, whereas the difference is made from the neto profit which is created from the packages.

3.9. Calculating the rate of investment returns

Besides returning the investments by months, we should calculate the return on investments by rate. The return of investments by rate shows how much money will be returned for one euro invested. We create the query "*Return of investment by rate*" and it will have these fields: *Package.Description, Channel.Description, Net profit, Invested total,* and *Return of Investment*.

The neto profit is given above, but we will write it here again:

*Net profit: ((([Client number] * [Price seller] + 10 * [Input price]) - ([Client number] * [Cost per TV] + [Bandwidth] * [Cost per 1 Mbps])) - ([Cost of public services] + [Salary expenses] + [Other expenses]) - (0.2 * ((([Client number] * [Price seller] + 10 ***

[Input price]) - ([Client number] * [Cost per TV] + [Bandwidth] * [Cost per 1 Mbps]))
- ([Cost of public services] + [Salary expenses] + [Other expenses])))

Likewise, the field *Invested total* is also written below:
Invested total: ([Client number] / 512) * [Equipment.Price] + [Client number] *
[Equipment1.Price] + [Client number] * [Equipment2.Price] + [Distance from base] *
[PricePerUnit] + ((([Client number] / 512) * 8) * [Separator.Price]

Whereas the field *Return of Investment* is obtained through the formula
below:
Return of Investment: [Net profit] / [Invested Total] * 100

4. Conclusion

According to nowadays several researches, creating the databases before
the process of operative activities starts, is something that is not applicable in
Kosovar businesses. We can say this according to researching done online
through the internet but also through everyday contact with firms that deal
with the same (fiber link). The database created above, includes all the
necessary elements that a potential investor might need for presentation,
starting from the prices of wholesale and retail equipment that are dependent
on the number of customers and the distance from the base, other necessary
operating expenses, the package offers, and the calculation of potential profit
from investment and the time on investment return.

The database created on this chapter has a possibility of expansion. Such
extension can be done through developing a software which would make the
registration of client's payments (full or partial payments), dates of payments,
the remaining debt, and also the automatic disconnection from the TV signals
receiving system, in case of not paying the obligations.

The selling price is € 15 and € 20, withe the only difference that the price €
20 offers the sport channels as well. This price might be changed according to
market need. Other special offers of coded foreign programs might come up.
Offers are constantly updated and include poaching based on cultural and
sports events.

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