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THE ROLE OF INFORMATION SYSTEMS IN LOGISTIC ENTERPRISES

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Abstract: Well-developed information channels play very important role for the institution. In this paper had been researched the Ukrainian wholesale market for purpose to make the comparison between information distribution channels on the chosen agricultural wholesale markets in Poland and Ukraine. Also had been defined the recommendations for future development of information distribution systems for purpose to improve the market activity.

Keywords: wholesale market, information distribution channels, Analytical Hierarchy Process

INTRODUCTION

Role of wholesale markets is very important for the country. Now wholesale markets situated not only on specific location but also in the Internet. Many wholesale markers create their own web-sites where there is a possibility to provide online trading. Owing to well-developed information systems this type of trading works very well and makes the trade easier. Now sellers and buyers can find easily each other. They don't need to spend time for looking for buyers and at the same time they reduce their needs for warehousing that reduces costs.

If company work with specific product (for example flowers), there could appear also problem with time between product tracing from the buyer to seller. That is why it is very important for seller to find the buyer as fast as possible in purpose to have production still fresh.

Flower production is very specific and need special care. Flowers should have special condition as for transportation as for warehousing as well. There is two ways of making them fresh as long as possible: to use chemicals and special

equipment or to bring them to buyers immediately. If company needs warehousing, thereby its costs increase.

It is also important to take into account costs benefits of the information systems for the company. If company has information system, then it doesn't need to spend big money for the staff as IS makes everything by itself. Company concentrates mostly on production work and not on calculations and so on.

DEVELOPMENT OF FLOWER MARKET IN POLAND AND UKRAINE ON THE EXAMPLE OF BRONISZE AND STOLYCHNYI WHOLESALE MARKETS

Brining to the buyers immediately need from the seller so called skills of "fast finder of buyers". As the example, where it is possible to find such things work, we can take the Flower Auctions in Holland. Owing to their information systems, buyers even can sell their production directly from their home. There is no faster way for meeting a buyer with the seller. Owing to well-developed information its became possible for our purpose. Thereby members save their time. They can find each other faster, more transactions can be made and as the result – profit will be higher.

Such kind of online trading should be introduced in such countries as Poland and Ukraine. For Poland it would be easier, because here exist well-developed wholesale markets with good infrastructure. Such markets just need some additional technologies to create flower auctions.

In Ukraine the situation is slightly different. Here even a lot of web-sites need further improvements. Some wholesale markets don't have possibility to display the information from the web-page in English language. But other try to use some IS for purpose to make trade better. Such kind of wholesale markets will be described in this article.

Stolychnyi wholesale market just started to work. There are not enough infrastructure facilities. Building process of flower departments still isn't finished. There are four different pavilions. At the market there is trade of vegetables and fruits, also fresh fish and meat.

Project in the market Stolychnyi is to create the competitive European place for supply and demand meeting. There are presented prices from the last trade. Also here are contacts of members of the market with information about them. What is good point – it makes easier for sellers to find the buyers(they just can use information from page – unfortunately only if they know Ukrainian language).

Table 1. Comparison of distribution channels in Ukraine and Poland wholesale markets

Characteristics	Stolychnyi wholesale market, Ukraine	Bronisze wholesale market, Poland
Web-site possibilities	Just Ukrainian language available	Well-developed
Displaying of prices	No historical data of prices, presents of current prices	Presence of historical data of prices, presents of current prices(only for registered users)
Description of activity	There are presented full description about institution activity	There are presented full description about institution activity
Marketing	The market use radio, newspapers, TV, Internet and other sources to promote their activity. Also there is presented information about project implementation progress	The market use radio, newspapers, TV, Internet and other sources to promote their activity
Contacts	Well-organized	Well-organized
Departments	Some departments aren't finished, description presented	Whole description presented. Each department works successfully
Flower department	In progress(doesn't work yet)	Working well
Description of members	Full description about members only from the pavilions with fruits and vegetables	Full description about members
Direct Selling from cars	Available	Available
Number of flower firms	Information isn't presented	Around 60

Source: own work

INFORMATION SYSTEMS AND TRANSACTION COSTS

It has a sense to introduce the ITC only when the costs of ITC are less than transacting costs.
ITC can help the enterprise to reduce:

- Searching costs (ITC can make searching process faster and better, especially when there are published too much information about the market. This situation is very common in the wholesale markets. It's only effective in the situation when the searching costs are higher than the costs for information gathering by ITC)
- Negotiation costs (ITC can make sharing of information between actors more successful and decrease the information asymmetry).
- Enforcement costs

For this purpose Distance sales service is presented in the market Stolychnyi.
In the wholesale market Stolychnyi is presented distance service which provides possibility for traders to save their time and money. Actors are able to stay at their place and don't need to visit the wholesale market.
There are presented the following advantages of such service:

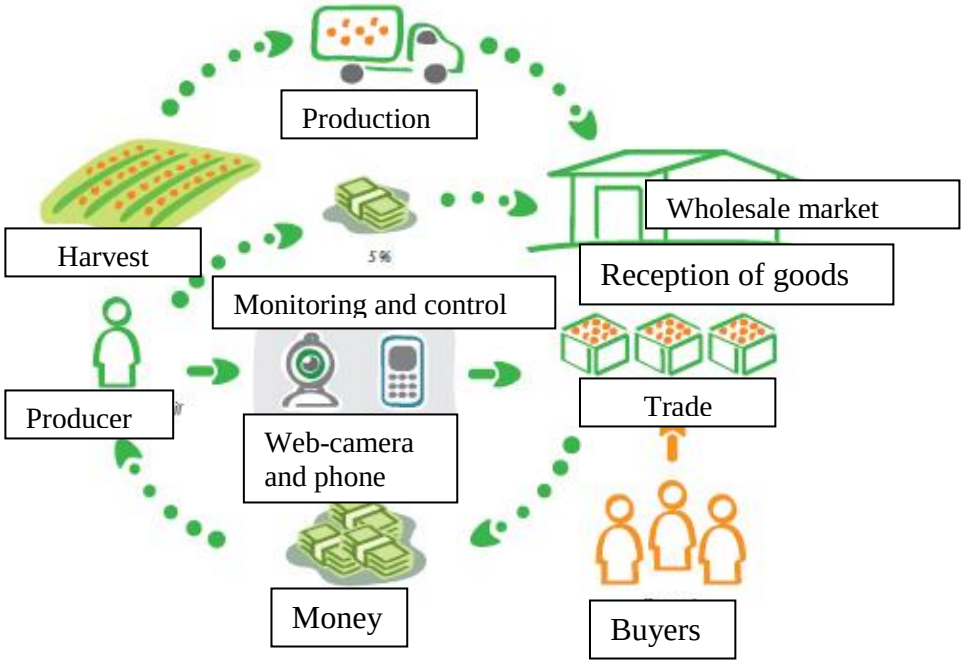
1. The wholesale market price is higher in comparison with price, set when grower sells directly from the field.
2. New distribution channel
3. Costs of this service are not exceed 5% of production costs, what is lower in comparison to costs of other distribution channels
4. Wholesale market is interested to made transactions as fast as possible.
5. Promotion on firm on the biggest trade fairs in Ukraine.
6. Seller has complete information about market situation connected with prices, supply, demand, and quality of production, alternative offers and competitors.
7. Convenience to work through the Internet on PC or cell phone. Control of the process in online regime.
8. Market responsibility of production taken for selling
9. Possibility of warehousing

Wholesale market guarantees:

1. Information about production sold during last 3 days
2. Place for selling goods, professional sellers and loaders
3. Control of realization process in online regime with web-camera
4. Possibility of interactive price bargaining
5. Information about market prices
6. Daily reports about quantity of sold production
7. Information and marketing support

This new service will give possibility for sellers to decrease their transaction costs and as a result –to increase their benefits. The scheme of this process is shown on the graph below.

Figure 1. Information distribution system in the market Stolychnyi



Source: web-page of wholesale market Stolychnyi

Another important service offered by market Stolychnyi is the possibility to buy online on web-page www.zakaz.ua. This web-page is better made in comparison with market one. There is also a possibility to choose English language, observe prices and supply of production. This is online distribution channel which just started to work.

To be able to use all these services the company needs:

- Software (on cell phone, computer and similar access device)
- Access to the Internet

Both of these companies possess such devices.

In the articles there had been made the estimation of quality service of information distribution channels in the wholesale market Stolychnyi.

For this purpose were used statistical method which called Analytical Hierarchy Process. This method was developed by Tomas Saaty and it gives possibility to evaluate qualitative data in quantitative values.

The following hierarchy was used:

- In the first step the goal should be created,
- Establishing of criteria and their ranking,
- Definition of the alternatives.

The scales from 1 to 9 were used for purpose to evaluate criteria and alternatives.
The theoretical sense of the AHP method can be presented as followed:
There is known matrix (n x n) of criteria' preferences

$$A = [a_{ij}]$$

with diagonal with value 1, characterised by

$$a_{ji} = 1 / a_{ij}$$

Vector of priorities:

$$\begin{bmatrix} w_1/w_1 & w_1/w_2 \ldots & w_1/w_n \\ w_2/w_1 & w_2/w_2 \ldots & w_2/w_n \\ w_n/w_1 & w_n/w_2 \ldots & w_n/w_n \end{bmatrix} \begin{bmatrix} w_1 \\ w_2 \\ \ldots \\ w_n \end{bmatrix} = n \begin{bmatrix} w_1 \\ w_2 \\ w_n \end{bmatrix}$$

The principle of determination of the vector of priorities is to consider each lement of the matrix of criteria' preferences

$$a_{ij} = \frac{w_i}{w_j}, w_i, w_j$$

"W" – Weight of the certain estimation relative to i^{th} and j^{th} criteria. The demand of transitivity is fulfilled by cohesion of estimators. It means: if the element I is preferred against j and element j against k, element I is preferred against k.

$$Aw = nw$$

$$Aw = \lambda w$$

$$(A - \lambda I)w = 0$$

$$\det(A - \lambda I) = 0$$

$$\lambda_{\max} = n$$

$$CI = \frac{\lambda_{\max} - n}{n - 1}$$

$$CR = \frac{CI}{R}$$

If deviation between λ. max and value n estimated by CR pass the possible limits, the estimation of validity of criteria must be done again.

T. L. Saaty recommends giving to the critical value CR value 0.1. If CR is less or equal 0.1, it can be said that correspondence exists. If CR is more than 0.1, then the analysis must be repeated.
The following criteria of importance were chosen based on the research made by prof. Parlinska:

- Reliability,
- Availability,
- Costs.

There were made ranking of criteria of importance. There were made questionnaires between experts to create it. (Parlińska 2008)

Table 2. Weights of criteria of importance

Source of information(criteria)	Vectors of priorities
Reliability	0,54
Availability	0,297
Costs	0,163
Sum	1

Source: [Parlińska 2008]

Consistency index is equal to 0,01. The sum of these weights must be equal to 1.
According to all these criteria the following distribution channels were evaluated:

- Internet
- Radio
- Press
- TV
- Phone service

Table 3. Ranking of alternatives based on criterion "Reliability"

Source of information (alternatives)	Vectors of priorities
Internet	0,7
Radio	0,001
Press	0,01
TV	0,001
Phone service	0,288

Source: own calculations

Table 4. Ranking of alternatives based on criterion “Availability”

Source of information (alternatives)	Vectors of priorities
Internet	0,6
Radio	0,007
Press	0,002
TV	0,001
Phone service	0,39

Source: own calculations

Table 5. Ranking of alternatives based on criterion “Costs”

Source of information (alternatives)	Vectors of priorities
Internet	0,5
Radio	0
Press	0
TV	0,5
Phone service	

Source: own calculations

Table 6. Final ranking of the information sources

Source of information (alternatives)	Final vector of priorities
Internet	0,6377
Radio	0,002619
Press	0,005994
TV	0,000837
Phone service	0,35285
Sum	1

Source: own calculations

According to the results in table Internet service is the most developed and together with phone service. For clients these sources of information are the most available. The questionnaires were made among people from wholesale market Stolychnyi. The sample contained of 30 responders from different ages.

CONCLUSIONS

In according to the conducted research, it is necessary to remark that Warsaw wholesale market is better developed than Kiev one. But at the same time market Stolychnyi develops from day to day better and better. Building process is going well. Even in this situation trading works there. Only one thing should be changed for purpose to get international level, it is the language of web-site. At least English language must be added.

Possibility of online registration is very important for both countries. For such purpose the good Information System is required. For market Stolychnyi it is a bit early to introduce, but for Bronisze market it is already good time. Bronisze market has well-developed infrastructure and can concentrate its activity on making, for example, online auctions.

If the company will have the opportunity to register online, it will save a lot of time and reduce the costs.

Online trading gives advantages for the company such as finding sellers or buyers, trading directly from the home or working place.

Also it would be useful to create mobile version of web-site. Owing to this, participants will be able to work from each place all over the world. Company will be able to find more potential buyers, check demand and supply, prices and so on. It can make decision making process easier and faster.

REFERENCES

Cordella A. (2006) Transaction costs and information systems: does IT add up? Journal of information technology, 21 (3). pp. 195-202

Parlińska M. (2005) Hierarchy of Decision Making Process. [w:] Monografia: Studia Universitatis Babes-Bolyai; Oeconomica, Printed by Economics Faculty, Babey's Bolays University of Cluj Napoca, Romania, s. 73-78.

Parlinska M (2008) Rola informacji w gospodarce rynkowej na podstawie wybranych rynków rolnych, Wydawnictwo SGGW, Warszawa

Saaty T.L. (2000) The Analytic Hierarchy Process, New York: McGraw Hill. International, Translated to Russian, Portuguese, and Chinese, Revised editions, Pittsburgh: RWS Publications.

http://www.kyivopt.com/

http://www.bronisze.com.pl/