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**«Development of management information systems at the trade enterprise»
(based on the materials of LLC – Enterprise «Prodmashstroy», Sevierodonetsk)**

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INTRODUCTION

The relevance of the study. In modern world and its unstable economic conditions, world pandemic and intensive development of competition on the market field, the achievement of any competitive advantages by the company is one of lots issues by what companies struggles with. Different competitive advantages of the enterprise are the base of its successful activity and goals achievement in the competitive market environment. That is why the growth and improvement of competitive advantages are one of the main sated goals of the enterprise. Company's strategy and ability to meet their customers' needs and company's proposals, to achieve economic growth, is the key to the economic success for the company, which allows it to enlarge its income and stay competitive at the market. The development of competitive advantages of any enterprise is vital thing to increase its competitiveness.

Fast-changing markets pushes every company to the need of monitoring and evaluation of the current position of the company at the market place. It also forces it to analyze changes in the external and internal environment of the organization. Last trends, customer needs, competitors' offers and many other issues push companies to ride on total control and investigation of innovations and new coming conditions.

There is still a number of issues that remain the subject of debate among economists, despite of the many studied themes, given recommendations and practice of research. Mostly scientific works of domestic and foreign scientists use a universal approach when considering the role of competitive advantages of the enterprise in gaining more space in the market share, taking into account the increasing intensity of competition industry. At the same time, companies are still looking for alternative ways of being individual and progressive in their growth.

Significant scientific contribution to the study of theoretical aspects, problem solving and development of methodological and practical recommendations were studied by lots of scientists such as: M.E. Porter, E.A. Didenko, M. Išoraitė, V.V. Melnyk, H.T. Piatnytska, Z.M. Zadorozhnyi, Y. Sudyn and others.

The purpose of the study is determination of the main weaknesses of the management information systems and an elaboration of a strategy of management informational systems modernization at trade the enterprise LLC – Enterprise “Prodmashstroy”.

According to the purpose of the study, the following **tasks** were formulated and solved:

- to determine the theoretical and methodological bases of management information systems at the trade enterprises;
- to analyze the dynamics of the efficiency of management information systems at the trade enterprises according to the reports of LLC – Enterprise “Prodmashstroy”;
- to develop main directions of improving management information systems at the trade enterprise LLC – Enterprise “Prodmashstroy”;
- to create a strategy of management information systems modernization for LLC – Enterprise “Prodmashstroy”.

The object of the research is the process of management information systems modernization at the trade enterprise.

Subject of the research is theoretical, methodical and practical aspects of the process of management information systems modernization at the trade enterprise – LLC – Enterprise “Prodmashstroy”.

The empirical basis of the research is the materials of financial and statistical reporting of Limited Liability Company – Enterprise «Prodmashstroy». The enterprise is located at: Sevierodonetsk, Maiakovskoho Street, 2V. The main activities of the company are carrying out deliveries of chemical products, truck transportation, manufacturing and mount reinforced-plastic structures (windows), renting, computer diagnosis of vehicles and provision of agricultural fields for fishing and hunting. The

overall performance of LLC – Enterprise «Prodmashstroy» in 2020 is defined as one of the decreased and lower income years.

Research methods. In order to make rational conclusions in the process of writing the final qualifying paper were used methods of scientific abstraction, analysis and synthesis, as well as methods of structural and systematic analysis, expert analysis, and the method of comparative characteristics.

Information base of the research. In the final qualifying paper were used official materials of the State Statistics Service of Ukraine, scientific works of domestic and foreign scientists, as well as data of own researches, financial statements and reporting of the enterprise and information resources of the world information network Internet.

The scientific novelty of the final qualifying paper is in its new plan of implementation the latest trends from the information systems' market, based on the current socio-economic situation of the enterprise and the theoretical bases of the final qualifying paper.

Structure and volume of the final qualifying paper. The final qualifying paper consists of an introduction, three parts, conclusions and recommendations, references and appendices. The main text of the work is 50 pages, including 15 tables, 6 figures and 3 formulas. The list of used sources contains 38 items listed on 5 pages. The work contains 7 appendices set out on 16 pages.

PART 1. THEORETICAL AND METHODOLOGICAL ASPECTS OF MANAGEMENT INFORMATION SYSTEMS AT THE TRADE ENTERPRISE

1.1 Essence of management information systems at the trade enterprises

One of the main priorities of the modern trade market is the successful development of enterprises, which includes many different factors like innovations, competitiveness, well-built strategy, etc. High level of competitiveness is the main goal for any enterprise, because it mainly describes all needed factors for profitable running a company and, at the same time, acts as an opportunity for company's future development.

One cannot deny that effective management of information systems (MIS) at the trade enterprise is a base for productive and competitive way of running a business. Information systems are important resources for any trade company due to ability of well organizing and improving the enterprise's work. From the first sight, it needs to be noted here, that the main purposes of informational systems are:

- to help with maximizing profit;
- to satisfy customer needs;
- to increase the effectiveness of enterprise operations as well as the main purposes of running an enterprise - increasing its profit;
- to develop the company's running strategy;
- to develop its competitiveness at the market place.

With a foundation of scientific resources, it is increasingly evident that MIS can not be defined or understood in the only one way, because each enterprise sets its own frames of work. The theoretical aspects and definitions of MIS are changeable and are developed according to specific company and market innovations. The analysis of modern information sources and authors' points of view showed different definitions to finally determine the essence of the management information systems, its main tasks,

importance and development importance at the trade enterprise. So, the essence of the management information systems can be understood from the perspective of responsive scientific researches and authors' definitions of the MIS, which are presented in the table 1.1.

Table 1.1

Definitions of management information systems

Author	Definition
Dr. David Bourgeois [8] p.16	An information system (IS) can be defined technically as a set of interrelated components that collect, process, store, and distribute information to support decision-making and control in an organization.
Andy Marker [1]	Management information systems are tools used to support processes, operations, intelligence, and IT. MIS tools move data and manage information.
Katie Bascuas [17]	Management information systems and services majors examine how technology can be used to access, store and share information to help our lives run more smoothly.
E.Yu. Sarmina, T.L. Fomicheva [12]	The information management system is designed to solve the problems of strategic and tactical planning, operational management, accounting and tax accounting.
David Ingram [4]	A management information system (MIS) is a set of systems and procedures that gather data from a range of sources, compile it and present it in a readable format.

Source: Compiled and systematized by the author

All of these interpretations of MIS complement each other, because each author gave its own point of view on the concept and did it from his own perspective. To summarize all mentioned above, the management information systems can be defined as a part of a complex of enterprise toolkits, which allows it to obtain higher economic, financial, organizational, technical and marketing results than its competitors at the

trading market. Another interesting and important aspect of MIS is the ability to multitask.

Doubtless, companies are keen on competitiveness and actuality, so information systems can be understood as a tool for competitiveness improvement, which, in return, is a force for company's well-being. Porter M., based on the definition of the concept of "competitive advantage" of the enterprise, identifies two main types of competitive advantages: giving buyers more value at a lower price (cost leadership) than competitors do or by creating a product that is perceived within the industry as unique (differentiation). Also competition defines competition area. Companies should decide whether it focus on all market or on specific segment [19].

The last option arises depending on the choice of competitive strategy used by a particular segment (Appendix B). Intermediate positions should not be adopted, as they lead to a loss of competitiveness [26].

Productive software such as word processing, spreadsheets, graphics, different PC programs, adopted to a company's specific work, a variety of tasks and, of course, MIS could be named as an example of working tools. It is not a secret, that running a successful and competitive trade company, demands from its top executive managers to use only tools that are able to support processes, operations, intelligence, and MIS part at the trade enterprise. These tools are core in management information systems which help to move data, keep it save and well organized and to manage wide information flows (Appendix A)[29].

In general, innovation is defined as conversion of science and technology to economic and social utility and it expresses the transformation of an idea to a marketable product and service or a developed production or distribution method [18].

MIS cope with a huge amount of essential information, which reduces an ability to make a mistake due to human factor and makes work with data easier. It's clear, that informational systems differ from the company's needs and can execute different tasks, for example there are knowledge management systems, transaction processing

systems, learning management systems, decision support systems, database management systems, office information systems, etc. All of them are responsible for various tasks and, basically, each enterprise use not the only one IS.

Every IS has its own parts that it is responsible for and its own algorithms which allows it to work. The most popular directions are sales, marketing and company's support. For example, marketing block permits to plan, organize, statistically control, analyze advertisement results and target audience. In addition, it gives an opportunity to make a budget and work according to plan or to be flexible on a marketing matters. Experts add that sales block opens opportunities to control the classification of customers and contacts, to show sales cycle; to make sales forecasting; to prepare commercial offers automatically; to broad management areas; to monitor potential sales, etc.

Normally, all informational systems are divided into three categories according types of information: operational, tactical and strategic management. Modern scholars classify informational systems using different parameters. For example, Mr. Vikki Sharma the Assistant Professor of Shri Ram College of Commerce in Delhi University shows the next types of IS:

- Transaction Processing System (TPS);
- Management Information System (MIS);
- Decision Support System (DSS);
- Executive Information System (EIS);
- Expert System (ES);
- Office Automation System [33].

According to E.Yu. Sarmina, T.L. Fomicheva and to the world experts experience, unified information system for trade enterprise should at least include ERP (Enterprise Resource Planning). In Ukraine such systems include the Russian company 1C, which is used in Ukraine since almost 2000. Statistics says that in 2017 80% of all enterprises in Ukraine used 1C for accounting. As an example, LLC «Prodmashstroy»

still use this IS, albeit many experts expects 1C to crush. The second essential element is the automation system for design and construction activities, which main task is to ensure the growth of product quality. And the last element is the production process control system.

All these elements should work interface to achieve desired results, Thus, we can conclude that in modern conditions, enterprises are constantly expanding their assortment, and production technologies are constantly being improved [12].

Each company use suitable IS for its way of working and based on the its specificity of work. The table below shows the classification of information systems, which are common at the trade enterprises.

Table 1.2

Common types of informational systems at the trade enterprises

#	Type	Purpose
1.	Enterprise Resource Planning	Planning systems for company's resources
2.	Enterprise Content Management	Is used to support a single life cycle of disordered information (files) of various types and formats
3.	Corporate Performance Management	Automated integrated personnel management system.
4.	Customer Relationship Management	The system of organizing the work of the company with a focus on client's needs, for more active and fruitful work with the client.
5.	Electronic Document Management	Document management system
6.	Human Resource Management	Provision of the organization with personnel and its optimal use.
7.	Enterprise Asset Management	The system is intended mainly for the automatization of processes related to the maintenance of equipment, its repair, as well as after-sales service of this equipment.
8.	Human Resource Management	Provision of the organization with personnel and its optimal use.
9.	Business Process Management	The system responsible for the document flow of the enterprise in the complex

Source: Compiled and systematized by the author based on the [15]

Based on the IS classification and the amount of body of data, the main IS tasks can be highlighted:

- running the process of making managerial decisions;
- providing reliable information on time;
- improving the efficiency of the management system [12].

Gartner company did a survey in 2011 about the importance of developing MIS and made a conclusion that surveyed CIOs see technology strategies as closely related to business strategies [28]. First of all, MIS develop productivity which means the ability to manage company's challenges such as cost efficiency, service quality and a contribution to the productivity of the business. Secondly, MIS improve the delivery of information rightly. Thirdly, it reduces costs by automating lots of processes, as a result employees can work more efficiently, and this is a dream situation of any CEO. And the last, it permits "to be on the short leg" with clients and give them a high-quality service.

Doubtless, all successful trading companies enlarge its work amount and work force each year, which means more appropriate IS usage. Innovative IS give an option for permanent development and constant work ramp up.

Statistic shows, that in 2017 the most used information systems in Ukraine were: Bitriks24 – Russian system from the 1C developers (26%), Terrasoft (15%), Amocrm (9%), Salesforce (5%), OneBox (3%) [28].

However, if the company's top executives want to see income growing, they also should make changes in all company's brunches and work aspects, because the enterprise is a complex mechanism and it needs to be developed not partially. In the modern trading market and new fast-changing market conditions, implementation of updated informational systems is one of essential tools of improving the quality of the enterprise management system and, as a result, improving company's well-being.

1.2 Methodological toolkit for evaluating the efficiency of management information systems at the trade enterprises

Changes in the external environment stimulate enterprises to absorb new methods, systems and approaches to the development of competitive advantage. Evaluating the efficiency of management information systems of the trade company is necessary to obtain key success factors compared to competitors.

Evaluating of the efficiency of the trade enterprise requires accuracy and comprehensiveness, but it also require a significant investment, time and money. To be honest, there is no single methodological tool for assessing the competitive advantages of the enterprise, because usually each company and its management use different ways and toolkits to evaluate the efficiency of MIS and IS separately, based on the company's goals and central importance. Different scholars interpret methods of evaluating competitive advantage differently; usually it is done on the enterprise's example or on the theoretical bases.

The other side of the coin is, however, that all existing methods of evaluating management of information systems has its advantages and disadvantages due to the specificity of the company and of course, they evaluate MIS and IS separately.

In addition to all mentioned above, typical long-term MIS usage includes not only IS by themselves, it also contains the following;

- people (whose who actually use IS);
- data (all recorded information);
- instructions (how to work with the data and clients);
- hardware (equipment);
- software (programs or IS itself).

As it was already mentioned, MIS is a complex, so the evaluation should be done according to all these factors.

In general, all existing assessment methods and toolkits for evaluation are based on fast-changing market situation, analysis of famous and good-running company's position, competitive market potential, which includes innovations, level of innovation competitiveness of the enterprise and aimed at developing and implementing new effective development complex of strategies.

To determine the calculated reliability of technical means use data on the reliability of the elements included in them. Reliability is related to the level of technical development, so the indicators the reliability of technical means is constantly increasing, which must be taken into account in the calculations in subsequent periods.

Improving the reliability of the system is not an end in itself, but only one of the means of ensuring a high level of efficiency. The reliability of the system largely determines the overall economic performance of its work [21].

Let us first consider what is the effectiveness of IS and how it is evaluated. According to the scientific research of Netsvetaiev V.A., Kochura Ye.V., Maneliuk Ye.V., the effectiveness of an information system is the ability of an information system to fulfill its goals and objectives under certain conditions and with a certain quality [22]. It can be evaluated by dividing all obtained results into all expenses that were needed for its implementation and development under the enterprise conditions.

The main factors influencing the reliability of the information system and its components, can be divided into two groups:

- 1) hardware (technical), ie those that depend on the condition of the equipment and its elements;
- 2) non-hardware, ie those that do not depend on the state of the equipment, but affect the functional reliability [21].

Therefore, after analyzing different information source and science studies, the most common groups of methodological tools for evaluating the efficiency of MIS at

the trade enterprise can be named as financial analysis methods, qualitative analysis methods, probabilistic and statistical methods of analysis.

The following table shows the rate which are included into analysis methods and can be calculated for future evaluation.

Table 1.3

Groups of analysis methods

Financial	Qualitative	Probabilistic and statistical
ROI (return on investment)	BSC (benchmarking, consumer perception, information-balanced scorecard)	ROV (fair valuation of options)
ARR (investment efficiency ratio)	BITS (internal rate of return)	AE (applied information economics)
NPV (net present value)	IE (information economy)	EVS (economic benefit of resources)
IRR (internal rate of return)	PM (portfolio management)	
REJ (quick economic justification)	ABC (functional-cost analysis)	
EVA (economic added value)	TEI (cumulative economic effect)	
TCO (total cost of ownership)		

Source: Compiled and systematized by the author based on the [23]

As it was mentioned above, each method has its own advantages and disadvantages, that is why experts prefer to use specific assessment methods, based on the opinion of foreign and domestic scientists. From this variety they usually choose ROI and TCO methods, because ROI indicates the relative excess of the benefits we receive over investments and TCO gives an opportunity to compare efficiency with other indicators.

ROI coefficient is defined as the ratio of the profit received from the CRM implementation to the amount of investment:

$$\text{ROI} = \frac{P_{\text{crm}} - P}{Z} * 100\% , \quad (1)$$

where the P_{crm} is the ratio of the profit received from the CRM implementation, P is profit received without implementation and Z is the amount of investment (all expenses for CRM implementation).

Troubles with calculation can be expected in the part of calculating all the expenses, because it requires a long period of time and also may include some extra expenses or even loses. However, the huge disadvantage of this formula is that expenses are not definitely a constant amount, because the costs still rise and each time the answer will change.

The second way of evaluation is TCO – Total Cost of Ownership – is more common and exact. TCO coefficient is defined from the following formula:

$$TCO = TCOp + TCA \quad (2)$$

where $TCOp$ is total cost of usage, TCA is total cost of direct implementation costs.

However, it is important to include all the necessary data into TCOp index, because it should include such factors as people expenses, the cost of the environment, expenses for technical support and other additional expenses. The disadvantage of TCO method is that it doesn't include strategy of the enterprise and its business risks [23].

One cannot also deny that the NPV coefficient can be also used as a method of MIS evaluation, but it has the same disadvantage as a TCO coefficient. NPV is calculated according to the following formula:

$$NPV = \sum_{i=1}^n \frac{Pi - Bi}{(1+r)^i} > 0, \quad (3)$$

where Pi are results which are obtained in i -period, Bi are expenses which are obtained in i -period, r is a discount rate, n - number of years of the life cycle CRM.

A review of the scientific resources showed that the methodological approaches to the assessment of MIS efficiency has both disadvantages and advantages, which are systematized in table 1.4 below.

Table 1.4

Comparative analysis of the advantages and disadvantages of MIS efficiency assessment methods

№	Methodological approaches	Advantages	Disadvantages
1.	Financial	Give an opportunity to evaluate financial aspect of IS implementation and usage from the investment point.	Do not include long-term and socio-economical and organizational results.
2.	Rrobabilistic and statistical	Give an opportunity to evaluate future risks.	They are impossible without statistical information and are really difficult to complete.
3.	Qualitative	Evaluate IS investments from the point of qualitative index.	They are usually based on experts' assessment and judgment.

Source: Compiled and systematized by the author based on the [23]

To sum up everything mentioned above, before making any changes, implementing IS or renovating MIS of the enterprise, it's important to complete a number of assessments to find out about possible changes and to know risks of the innovation. Furthermore, the enterprise's risk managers should definitely know which factors are important to make a decision and what needs to be done at first time.

PART 2. EVALUATION OF DEVELOPMENT OF MANAGEMENT INFORMATION SYSTEMS AT THE TRADE ENTERPRISE LLC – ENTERPRISE “PRODMASHSTROY”

2.1 General characteristics and organizational structure of informational systems at the enterprise LLC – Enterprise “Prodmashstroy”

Limited liability Company – Enterprise “Prodmashstroy” is multifunctional and diversified. Its main establishment operations are: chemical products supply, cargo transportation, windows production, real estate renting out, computer diagnostics and repair of commercial vehicles and ownership of fishing and hunting grounds “OKNINO”.

LLC – Enterprise “Prodmashstroy” has 20-year experience of working with chemical products and is the market leader of its supply. The enterprise also has a number of contracts with leading manufacturing plants and petrochemical companies of Ukraine [24].

The enterprise has its own web site, where customers can find a useful information about it – <http://www.prodmashstroy.com.ua/>.

The enterprise has a linear organizational structure (Appendix C). LLC – Enterprise “Prodmashstroy” employs about 30 professionals who are constantly working on improving their skills. The company constantly conducts business training for employees: sales, negotiation skills, customer service, conflict resolution, business management, etc.

One of the sources of formation general characteristics of the enterprise is financial economic activity that shows how effectively the company manages its own financial resources.

The source for the analysis of financial and economic indicators of the LLC – Enterprise “Prodmashstroy” are retrospective of consolidated balance sheets of the enterprise (Appendix D). 2016 – 2020 period is used as the research period.

At the end of the study period (2020) revenue is 31 163,5 thousand UAH, which is 37,53% less than at the beginning of the analysis period. This indicates the inability of the enterprise to operate in difficult economic conditions, like COVID-19, to use the existing competitive advantages, to meet the needs of its target market segment. This leads to the fact that the company has less financial resources to cover fixed and variable costs, to encourage efficient employees, to repay financial obligations, to solve other operational and strategic tasks.

The gross profit of LLC – Enterprise “Prodmashstroy” was positive at the end of 2020 and amounted to UAH 12 035,4 thousand against UAH 13 950,1 thousand. In 2016, which indicates the effective operational processes.

The amount of assets of LLC – Enterprise “Prodmashstroy” is declining and reached in 2020 16 488 thousand UAH against 18 954,1 thousand UAH in 2016, which is showed in Appendix E.

Both current and non-current assets affected this dynamics of asset decline by 13,01%. The former decreased by 19,11%, while the latter by 2,25% in 2016-2020 (Appendix F). The dynamics of assets is presented below.

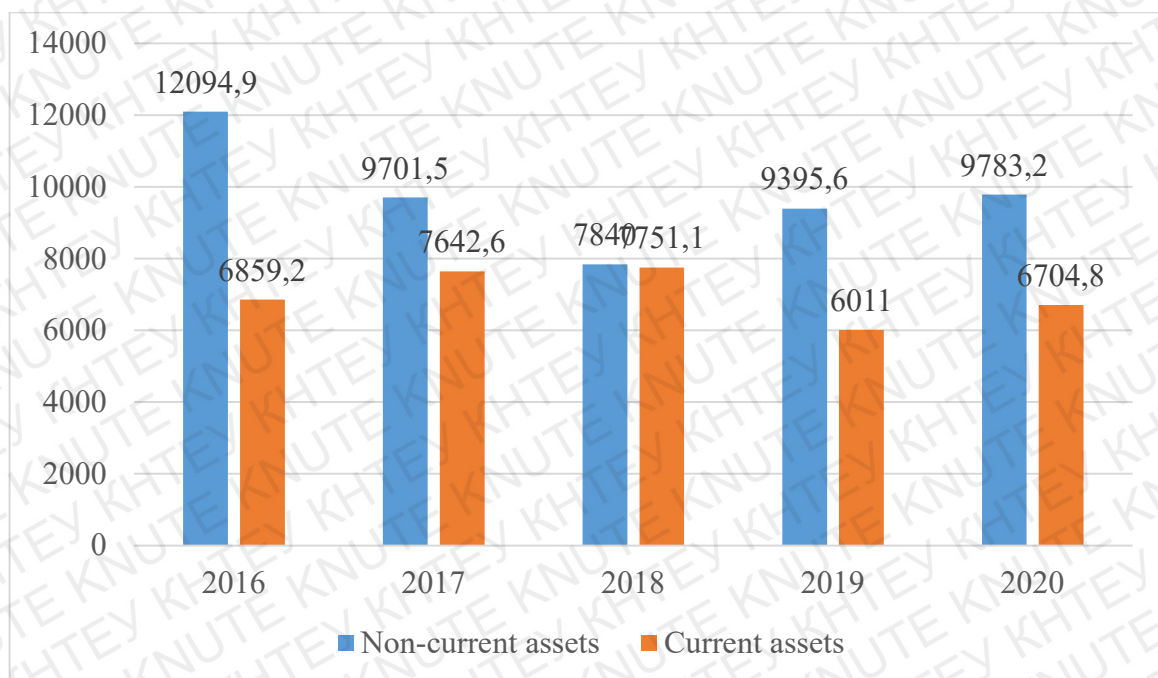


Fig. 2.1 Dynamics of assets of LLC – Enterprise “Prodmashstroy”

Let's analyze the dynamics of indicators of property status of LLC – Enterprise “Prodmashstroy” in 2016-2020 (table 2.1).

Table 2.1

**Dynamics of indicators of property status of LLC – Enterprise
“Prodmashstroy” in 2016 - 2020**

Indexes	Year					Absolute increment (deviation), +, -		Relative increase (deviation),%	
	2016	2017	2018	2019	2020	2020 / 2016	2020 / 2019	2020 / 2016	2020 / 2019
The share of working capital in current assets	0	0	0	0	0	0	0	діл. на нуль	діл. на нуль
Share of fixed assets in assets	0,34	0,41	0,47	0,37	0,36	0,02	-0,01	5,88	-2,7
Depreciation rate of fixed assets	0,55	0,55	0,57	0,67	0,69	0,14	0,02	25,45	2,99
Fixed assets renewal ratio	-	0,1	0,07	0	0,08	-	0,08	діл. на нуль	діл. на нуль
Share of long-term financial investments in assets	0,02	0,02	0,02	0,02	0,02	0	0	0	0
Asset mobility ratio	1,76	1,27	1,01	1,56	1,46	-0,3	-0,1	-17,05	-6,41

Source: Calculated by the author according to the reporting of LLC – Enterprise “Prodmashstroy” (Appendix D)

There is an increased level of depreciation of fixed assets, which creates additional production risks associated with the cessation of production or provision of services due to breakdowns.

Let's analyze the liquidity and solvency ratios of LLC – Enterprise “Prodmashstroy” in 2016-2020 (Appendix G). From the showed results, it can be said that the increased risk of loss of solvency of LLC – Enterprise “Prodmashstroy” is observed in the future up to 1 month, because the assets and liabilities of the first group

are not balanced. The company has 302.3 thousand less liquid assets than the most current liabilities. To solve this situation, it is necessary to attract short-term bank financing, use other tools to fill the lack of financial resources.

LLC – Enterprise “Prodmashstroy” does not work to reduce short-term risks during 2016-2020, and managers do not take measures to ensure a balance of short-term funding sources and current assets. This is evidenced by the decrease in the current liquidity indicator from 2,85 hryvnas to 2,38, which is showed by the dynamics of liquidity and solvency ratios of LLC – Enterprise “Prodmashstroy” in 2016-2020 (table 2.2).

Table 2.2

**Dynamics of liquidity and solvency ratios of LLC – Enterprise
“Prodmashstroy” in 2016 - 2020**

Indexes	Year					Absolute increment (deviation), +, -	
	2016	2017	2018	2019	2020	2020 / 2016	2020 / 2019
Current ratio (coverage)	2,85	3,17	2,7	3,07	2,38	-0,47	-0,69
Rapid liquidity ratio	2,2	2,23	2,1	2,29	1,62	-0,58	-0,67
Absolute liquidity ratio	0,53	0,28	0,2	0,42	0,1	-0,43	-0,32
The ratio of short-term receivables and payables	2,86	3,11	4,28	11,79	8,13	5,27	-3,66

*Source: Calculated by the author according to the reporting of LLC – Enterprise
“Prodmashstroy”(Appendix G)*

LLC – Enterprise “Prodmashstroy” had the opportunity to repay 220% of its current liabilities within three to six months from the date of the first reporting date (2016).

As for the value of the indicator at the last reporting date (2020), it is within the regulatory limits, because for each unit of short-term liabilities the company had 1.62

hryvnias of current assets, which could be quickly sold on the market and converted in cash. Figure 2.2 below shows the difference in ratios.

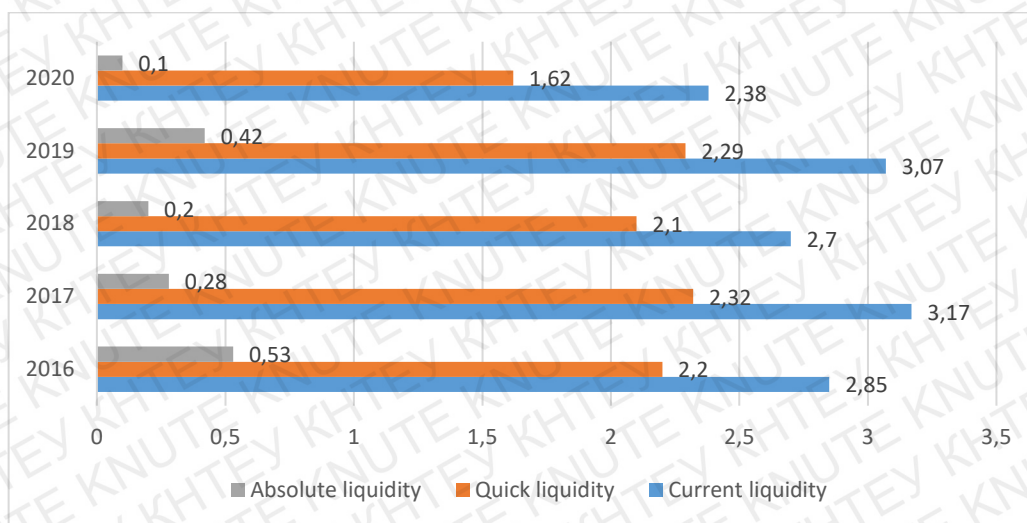


Fig. 2.2 Dynamics of liquidity and solvency ratios of LLC – Enterprise “Prodmashstroy”

Let’s analyze the dynamics of other solvency indicators of LLC – Enterprise “Prodmashstroy” in 2016-2020 (table 2.3).

Table 2.3

Dynamics of other solvency indicators of LLC – Enterprise “Prodmashstroy” in 2016-2020

Indexes	Year					Absolute increment (deviation), +, -	
	2016	2017	2018	2019	2020	2020 / 2016	2020 / 2019
General degree of solvency, months	1,02	0,47	0,67	1,13	1,58	0,56	0,45
Debt ratio on loans and credits of banks, months	0	0	0	0	0,03	0,03	0,03
Accounts payable debt ratio, months	0,58	0,29	0,29	0,17	0,27	-0,31	0,1

Source: Calculated by the author according to the reporting of LLC – Enterprise “Prodmashstroy” (Appendix D)

The company needs a time duration of 1.58 months to repay current and long-term liabilities from the money received from the sale of goods and services of LLC – Enterprise “Prodmashstroy”. The detected increase of 0.56 months indicates some reduction in overall solvency.

Let’s analyze the business activity indicators of LLC – Enterprise “Prodmashstroy” in 2016-2020 (table 2.4).

Table 2.4

Business activity indicators of LLC – Enterprise “Prodmashstroy” in 2016-2020

Indexes	Year				Absolute increment (deviation), +, -	
	2017	2018	2019	2020	2020 / 2017	2020 / 2019
Turnover of equity, turnover	5,42	3,86	2,6	2,52	-2,9	-0,08
Asset turnover, transformation ratio, turnover	4,33	3,16	2,1	1,95	-2,38	-0,15
Return on assets, turnover	11,53	7,17	5,01	5,42	-6,11	0,41
Turnover ratio of current assets, turnover	7,21	5,94	3,78	3,25	-3,96	-0,53
Period of one turnover of current assets, days	49,94	60,62	95,22	110,78	60,84	15,56
Inventory turnover ratio, turnover	21,64	15,82	9,54	6,96	-14,68	-2,58
Period of one turnover of stocks, days	16,63	22,76	37,73	51,74	35,11	14,01
Turnover ratio of finished products, turnover	-	-	69,54	33,06	-	-36,48
Period of one turnover of finished products, days	0	0	5,18	10,89	10,89	5,71
Coefficient of turnover of receivables, turnover	12,34	9,34	6,02	5,58	-6,76	-0,44
Receivables repayment period, days	29,18	38,53	59,84	64,48	35,3	4,64

Continuation of table 2.4

Accounts payable turnover ratio, turnover	28,51	23,53	22,98	32,89	4,38	9,91
Accounts payable repayment period, days	12,63	15,3	15,67	10,94	-1,69	-4,73
Production cycle period, days	0	0	0	0	0	0
Operating cycle period, days	45,82	61,29	97,57	116,2 2	70,4	18,65
Financial cycle period, days	33,19	45,99	81,9	105,2 7	72,08	23,37

Source: Calculated by the author according to the reporting of LLC – Enterprise “Prodmashstroy” (Appendix D)

From the table above next conclusions can be made:

- For each attracted hryvnia of this source of financing of assets of LLC PRODMASHSTROY LLC received 2.52 hryvnias of net income in 2020.
- Each hryvnia of LLC PRODMASHSTROY LLC provided 1.95 hryvnias of inflow of funds from the sale of goods and services during 2020.
- Accounts receivable of LLC PRODMASHSTROY made 5.58 turnovers per year, and the period of debt collection is 64.48 days.
- Customers when receiving goods and services of the enterprise, suppliers when receiving advances, other debtors divert proportionally larger amounts of money in the company at the end of the study period, which led to a decrease in turnover of this element of the asset by 6.76.
- The indicator of the financial cycle, which also takes into account accounts payable, is 105.27 days.

Let's analyze the dynamics of financial stability indicators of LLC – Enterprise “Prodmashstroy” in 2016-2020 (table 2.5).

Table 2.5

**Dynamics of financial stability indicators of LLC – Enterprise
“Prodmashstroy” in 2016-2020**

Indexes	Year					Absolute increment (deviation), +, -	
	2016	2017	2018	2019	2020	2020 / 2016	2020 / 2019
Own working capital, thousand UAH	7 854,2	6 640,1	4 933,9	6 333,6	5 669,6	-2 184,6	-664
Ratio of current assets with own funds	0,65	0,68	0,63	0,67	0,58	-0,07	-0,09
Maneuverability of own working capital	0,28	0,13	0,12	0,2	0,07	-0,21	-0,13
The ratio of own working capital stocks	2,84	2,3	2,82	2,67	1,81	-1,03	-0,86
Coefficient of financial autonomy	0,78	0,82	0,81	0,8	0,75	-0,03	-0,05
Coefficient of financial dependence	1,29	1,21	1,23	1,25	1,33	0,04	0,08
Financial leverage ratio	0,29	0,21	0,23	0,25	0,33	0,04	0,08
Equity maneuverability ratio	0,53	0,46	0,39	0,51	0,46	-0,07	-0,05
Short-term debt ratio	1	1	1	1	1	0	0
Financial stability ratio (investment coverage)	0,78	0,82	0,81	0,8	0,75	-0,03	-0,05
Asset mobility ratio	1,76	1,27	1,01	1,56	1,46	-0,3	-0,1

*Source: Calculated by the author according to the reporting of LLC – Enterprise
“Prodmashstroy”(Appendix D)*

LLC – Enterprise “Prodmashstroy” has formed its own working capital (5 669,6 thousand UAH), which can be used to finance part of the stocks required in the operating process; receivables that arise in the process of production and marketing;

other current assets. The amount of these funds decreased by UAH 2 184,6 thousand UAN for 2016 – 2020.

LLC – Enterprise “Prodmashstroy” is able to independently finance a significant share of the required assets, namely 75%. The fact that the corresponding figure is reduced by 0,03, indicates a decrease in confidence in the company by financial market participants, suppliers of material resources and services. Nevertheless, if the company loses solvency and goes bankrupt, a high share of equity will repay most of the liabilities.

Let’s analyze the type of financial stability of LLC – Enterprise “Prodmashstroy” in 2016-2020 (table 2.6).

Table 2.6

Type of financial stability of LLC – Enterprise “Prodmashstroy” in 2016-2020

Indexes	Year					Absolute increment (deviation), +, -		Relative increase (deviation),%	
	2016	2017	2018	2019	2020	2020 / 2016	2020 / 2019	2020 / 2016	2020 / 2019
Equity and reserves	14 713,4	14 282,7	12 685	12 344,6	12 374,4	-2 339	29,8	-15,9	0,24
Non-current assets	6 859,2	7 642,6	7 751,1	6 011	6 704,8	-154,4	693,8	-2,25	11,54
Own working capital	7 854,2	6 640,1	4 933,9	6 333,6	5 669,6	-2 184,6	-664	-27,81	-10,48
Long-term liabilities	0	0	0	0	0	0	0	0	0
Availability of own working capital and long-term sources for financing stocks	7 854,2	6 640,1	4 933,9	6 333,6	5 669,6	-2 184,6	-664	-27,81	-10,48

Continuation of table 2.6

Short-term liabilities	4 240,7	3 061,4	2 906,1	3 062	4 113,6	- 127,1	1 051,6	-3	34,34
Availability of own working capital, short-term and long-term sources for financing stocks	12 094,9	9 701,5	7 840	9 395,6	9 783,2	-2 311,7	387,6	- 19,11	4,13
The total amount of stocks	2 764,3	2 884,5	1 751,1	2 368,6	3 129,5	365,2	760,9	13,21	32,12
Excess (+), lack of working capital for the formation of stocks	5 089,9	3 755,6	3 182,8	3 965	2 540,1	-2 549,8	-1 424,9	-50,1	- 35,94
Excess (+), lack of own working capital and long-term sources for the formation of stocks	5 089,9	3 755,6	3 182,8	3 965	2 540,1	-2 549,8	-1 424,9	-50,1	- 35,94
Surplus (+), lack of working capital and short-term and long-term sources for the formation of stocks	9 330,6	6 817	6 088,9	7 027	6 653,7	-2 676,9	- 373,3	- 28,69	-5,31

Source: Calculated by the author according to the reporting of LLC – Enterprise “Prodmashstroy” (Appendix D)

The current state of financial stability can be described as a "fully stable enterprise". The structure and volume of financial resources of LLC – Enterprise “Prodmashstroy” are satisfactory, as the company has enough own sources of financing to form stocks of material resources and ensure the stability of production and sales. Thus, the current state can be described as strong. The surplus of own working capital for these purposes amounted to thousands UAH.

From the all mentioned above, we can make a conclusion that the management of information systems plays an important role of combining, storing and representing all information about the enterprise.

Forecasting and planning cannot be imagined without information. It is difficult to find solutions without information. Information is also collected at the control stage, making it possible to judge about real changes of the control object.

Enterprise's today's information system 1C: Enterprise helps with accounting with multiple charts of accounts and arbitrary accounting dimensions, solving problems of planning, budgeting and financial analysis, payroll. Many years it was a great solution to work with, but now IT technologies offer more convenient and multifunctional programs to use. Moreover, the enterprise uses one more program MeDoc. The main tasks which the program solves are creating reports, tax invoices, invoices and other governmental reports. "Medoc" is synchronized with 1C for data exchange.

LLC – Enterprise “Prodmashstroy” uses a method of interaction between two systems. When two systems interact with each other and data exchange occurs. Most of the time this is done manually, subject to typos and even delays. However, creating an integration interface between the two systems is a way to reduce the risk of such data exchange.

The company's management is faced with an increasingly accelerating pace of change, complex external economic factors and an increasingly complex environment. Managers need relevant information that will increase their knowledge and reduce the level of uncertainty.

The main element of the management information environment is information, and the main goal is to provide employees of the organization with the necessary information at the right time. Due to usual technical issues and the reduced opportunities of information systems, workers are in a lack of information on time.

As it was already mentioned, information system has several functions, including decision making, that is why her place in organizational structure is between workers and top management. It gathers information flow from the depth of the enterprise and gives represented into number one for director. Usually directors pay

attention for such reports and make their decision based on number of factors. And, of course, with faster access to the information, top managers can make better decisions about procedures and future directions.

2.2 Analysis of development of management information systems at the trade enterprise LLC – Enterprise “Prodmashstroy”

The role of Management information system (MIS) is vital nowadays in business environment because it has evolved over time to become an integral part of its business operations. The use of management information system has increased for last few years not only by firms, but also by individuals and even governments. Because of the today’s global environment where competition is very high, it is the basic requirement of the organization to install management information system to compete the market and to earn more profitability, invest in innovation in their products, and to grow their businesses [7].

Management information systems are distinct from other information systems, because they are used to analyze and facilitate strategic and operational activities. MIS is commonly used to refer to the study of how individuals, groups, and organizations evaluate, design, implement, manage, and utilize systems to generate information to improve efficiency and effectiveness of decision making, including systems termed decision support systems, expert systems, and executive information systems.

MIS tries to avoid duplication and redundancy in data collection, storage and dissemination of information. The designers of MIS are aware that a few key source documents account for much of the information flow and affect many functional areas.

MIS is designed to fulfill the information needs of management for future decision making. Despite a careful analysis of future information needs of the management, it is impossible to predict accurately all the events of three to five years ahead.

Nowadays, all activities of MIS like data collection, data processing and data retrieval are accomplished through electronic media. The use of computer assures accuracy and consistency in processing data and speeds up dissemination of information. That is why MIS should also pay attention to enterprise's workers and provide training for employees.

According to social exchange theory when organization takes care of employees, in return employees shows commitment and improvement towards organizational in order to enhance organization performance (Cropanzano, Mitchell, 2005) [16].

Evaluation of MIS is a process in which the performance of an organizational MIS is determined. According to the performance results, the organization evaluates and implements the necessary modifications in MIS.

The effectiveness of management is determined by what information used by the company and how it disposes of it. The costs of collecting information, its transmission, processing, storage and transmission to the user should be minimal. Technological advances in information technology and systems over the last years of the 21st century have made it possible and accessible to solve this problem. This was facilitated by the introduction of management computer technology and the latest information technologies.

Successful implementation or use of information technology requires effective human interaction with the information system. In addition, the issue of analysis of possible threats and risks for a particular information system, the choice of solutions for adequate and reliable protection of the system at a minimum cost is relevant. Therefore, one of the most important tasks that is solved when building an information system is the organization of its security [21].

For trading company LLC – Enterprise “Prodmashstroy” the development of management information system was not the first task to improve, because the enterprise decided to put all forces on the logistics and production improvement. As it is common among domestic enterprise's LLC – Enterprise “Prodmashstroy” top

management did not find a logical connection between initial processes of the enterprise and its financial situation, while foreign companies are keen on internal improvement, including information systems and its management.

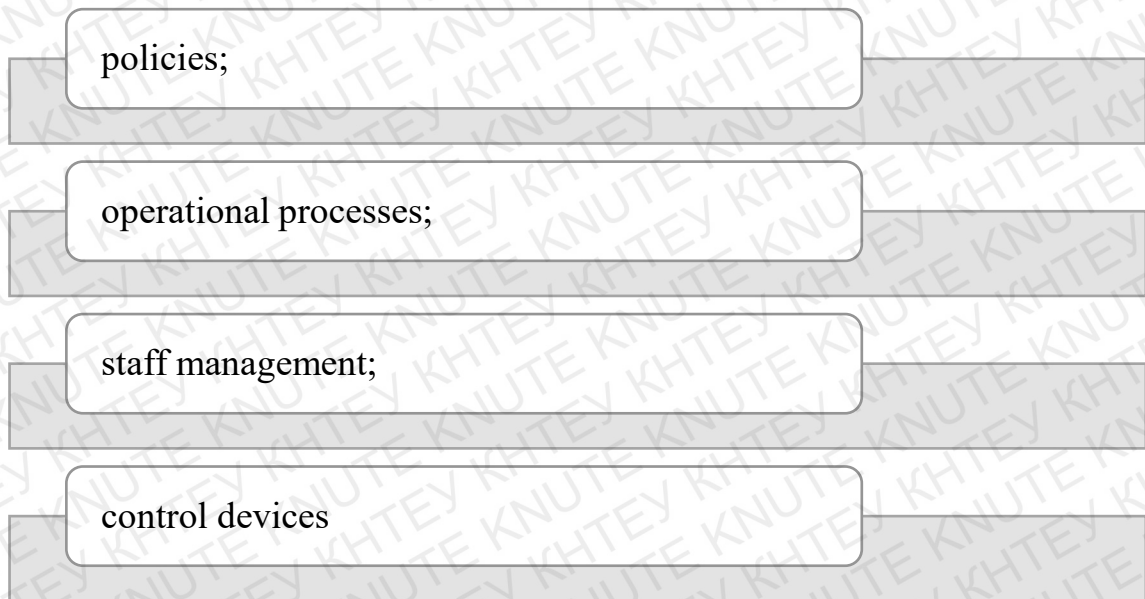
The transfer of information is the primary factor in the normal functioning of the enterprise. At the same time, ensuring the efficiency and reliability of information is of particular importance. And sufficient efficiency and accuracy of information can be achieved only if the information management systems work well.

Unfortunately, the corporation does not understand that management information systems help reorient users to analyze information, not just for tactical use. They also implement the integration of data from different departments, ensuring the systematic nature of the processes occurring in the enterprise. For example, the functions of accounting and reporting are transferred directly to the functional subsystems, increasing the efficiency of data updates and their reliability for future use.

The enterprise does not develop MIS that is why it has a lower level of technological support, investment and as a result, MIS has a lower level of effect on the enterprise's wellbeing. Company's management is struggling with a long decision making process and less innovative level of company's control.

Moreover, the enterprise does not have an MIS department to control current issues. Organization of the department is therefore necessary before the new system becomes operational. The roles of each member of the MIS department have to be clearly laid out before the new system becomes operational. Effort is made to ensure that the role of the MIS staff is understood by each member of the organization.

Effective management information systems is a very important component of the enterprise's overall risk management strategy; it supports top management's ability to perform such reviews. MIS should be used to recognize risks, monitor problematic situations, measure risks, limit expenses and manage risks. Risk Management involves four main elements, which include the following:



**Fig. 2.3 Main elements of risk management of LLC – Enterprise
“Prodmashstroy”**

As the enterprise did not have an effective MIS, so it was impossible to predict anything similar to pandemic of COVID-19 and any affects which it has brought. Company was not ready for economic crisis and had no measured risks for such situation. In addition, enterprise’s staff struggled with working online and top managers faced problems with controlling, multitasking and communication issues. The main controlling issues was that there is no information system which can monitor the process of employee’s work and show any progress results. Moreover, employees had no opportunity to work in team and see any team tasks. As a result, all vital processes of trade were done in a longer period of time, which has brought misunderstandings and problems with clients and suppliers.

To sum up, during the pandemic of COVID-19 the enterprise had the reduction of income and investments, which also effected company’s ability to modernize anything. Enterprise’s top executives made a wrong decision of not following trends of foreign companies and preferred to focus on the probability of staying stable and able to survive, as much as it was possible during the pandemic.

As a result of not effective management of information system, the enterprise is not able to grow and develop its inner processes, including the information base of the company and setting up all processes in the enterprise. It also faced reputation risks due to longer time delivery period, less client support, etc.

The need to use powerful management information systems at Ukrainian trade enterprises is resulted due to the urgent need to manage not only production but also other processes of the enterprise, especially in conditions of inflation and severe pressure. Effective selection and implementation of modern management information systems contribute to the improvement of the enterprise, the implementation of ways of its dynamic development, flexible management in complex and changing conditions.

To draw a conclusion, the management information systems of LLC – Enterprise “Prodmashstroy” was only in the first stage of its forming and not ready for any changes due to pandemic crisis, no ability to develop, lack of employees’ knowledge of MIS importance, etc. Such factors effected the enterprise’s economic, socio-economic, reputational aspects, which lead to a decrease in its income.

PART 3. DEVELOPMENT OF RECOMMENDATIONS OF MANAGEMENT INFORMATION SYSTEMS MODERNIZATION AT THE TRADE ENTERPRISE LLC – ENTERPRISE “PRODMASHSTROY”

3.1 The effectiveness and appropriateness of existing management information systems

The efficiency of the information system largely depends on the level of its reliability, primarily on the level of its reliability. Operational experience shows that the level of system reliability does not always meet modern requirements, so the problem of developing methods that would provide the necessary levels of system reliability characteristics is very important. The reliability of the system can be increased using various methods. At the same time every time company should choose a suitable method taking into account the cost, weight, size and other characteristics of the system.

To make an evaluation, enterprises often ask for help of specialist or, if they have their own specialist, they ask him for help. To see a clear picture, enterprise needs to find out several essential approaches of MIS evaluation. The first one is quality assurance review. The quality assurance review is also known as a technical review. It determines the technical quality performance of MIS. Current information system doesn't match with company's needs and its MIS has old technical approach due to low level of amortization and low level of investment into technical part of MIS and enterprise at all.

The second approach is reliability and accuracy. Reliability and accuracy is a key indicator of measuring the performance of an MIS. From the table 2.1 we have discovered that information accuracy of current information system is 87%, which makes statistical information distorted and can negatively affect not only enterprise's performance, but also its MIS due to incorrect managerial decisions.

And, as we know, MIS is the reason why many decision makers tend to prefer using MIS tools when making tough business choices. MIS as renowned concept, having good decision choices guarantees viable decisions in our businesses [13]. From the above discussion we can say that decision support system focus on decision making whereas management information system (MIS) focus on information. So MIS should be strictly based on accurate information.

The third approach is timeliness of information. The results of MIS must be recent. And when evaluating patterns, management must make assumptions about the organization's future, based on MIS data. A more recent on MIS, decision making always reflects on current reality and correctly predict their impact on the business. In this field current information system operates right. IC can provide managers with information on time, but still has poor information context.

The efficiency of the IC is determined by comparing the results from it functioning and costs of all types of resources necessary for its creation and development. Evaluation of the effectiveness of IC is carried out when:

- formation of requirements related to IP;
- analysis of created and functioning IS for compliance with the necessary requirements;
- choosing the best option for the creation, operation and development of IP;
- synthesis (formation) of the most expedient variant of IS construction according to the criterion “efficiency - costs” [21].

As it was mentioned before LLC – Enterprise “Prodmashstroy” is a quite stable company, which is able to work on its equipment, including information systems, but company decided not to improve and update it, due to expenses and not effective work of the system.

The enterprise has already implemented such information systems as IC and Medoc, but IC is more used at the enterprise. Unfortunately, we can't calculate they

estimated efficiency and there is no need actually, because this needs to be done before the implementation. Doubtless, we can calculate it's actual efficiency from it's working efficiency and decide whether the company needs a new system or not.

The generalizing criteria of economic efficiency of the system is the minimum cost of living human labor, but company's information systems are still need human labor to analyze information flows. 1C and MeDoc are not as automatized as modern systems and all information systems anyway need a human hand to make information into the action of update and information analyze.

The company uses the third generation of IP - DSS (Decision Support Systems). Such systems have not only a common database, but also a common base of models for solving problems. They are not focused on automating the functions of the decision maker (DMS), but on assisting in finding an effective solution.

DSS is focused primarily on solving poorly formalized business management problems that arise due to the high level of various uncertainties in the market environment. The purpose of such systems is not to automate the functions of ATS, but to support its actions in finding an effective solution. Particular attention in DSS is paid to the dialogue and "friendliness" of its interface to ATS.

Functional integration ensures the unity of objectives and harmonization of criteria and procedures for the implementation of production, economic and technological functions aimed at achieving this goal [21].

Since 1C is a computer system, that is part of the control loop, its efficiency is determined by fast action and reliability, as failure of the system to perform functions can lead to serious consequences, such as making the wrong decision.

As it was mentioned in first part of the work, there are 3 main way to evaluate the effectiveness of current information system. ROI coefficient has a huge disadvantage, because it expenses are not definitely a constant amount, because the costs still rise and each time the answer will change. Company doesn't have a total

amount of expenses, because it needs a long time period and all expenses for amortization. That is why we can't evaluate this index.

The second one is Total Cost of Ownership, which is more common and exact. Following the formula, presented in the part 1 and according to official enterprise's results, it can be calculated that:

$$\text{TCO} = 17685 \text{ uan} + 43764 \text{ uan} = 61\,449 \text{ uan}$$

The disadvantage of TCO method is that it doesn't include strategy of the enterprise and its business risks.

NPV coefficient can be also used calculated and used as a method of MIS evaluation, but it has the same disadvantage as a TCO coefficient. SO there is no needs to see to similar results.

In addition, the issue of analysis of possible threats and risks for the current information system, the choice of solutions for adequate and reliable protection of the system at a minimum cost is relevant. Therefore, one of the most important tasks that are solved when building an information system is the organization of its security [21].

Very often managers are faced with a situation of uncertainty and risk, the success of an enterprise, in this case, depends only on the ability of an individual manager to predict the results of his work.

Since any organization is located and functions in the environment. Every action of all organizations, without exception, is possible only if the environment allows for its implementation. The external environment is the source that feeds the organization with the resources necessary to maintain its internal potential at the proper level. That is why information system should be connected with environment it work with.

This connection should be aimed at analyzing the state of those components of the external environment with which the organization is in direct interaction. Let's compare current information system and new one, which is going to have all necessary abilities to work.

Table 3.1

**Compare analysis of current and new information system at the LLC –
Enterprise “Prodmashstroy”**

#	Connection / systems ability	Current system	New system
1.	Suppliers analysis	Can't present the difference in several suppliers on the diagram. It can only show economic results and numbers of expenses and then a worker can compare them.	Bright diagrams of each supplier, a number of requests, quality of products, stages of each delivery, duration of delivery, etc.
2.	Consumers analysis	Shows only number of orders for each customer and total order cost.	Shows time period, client satisfaction, number of orders, periodicity, built diagrams to shows which customer orders more and calculates popular products.
3.	Labor analysis	Show a number of orders for each worker.	Show the diagnostic of order amounts, its growth or declaim, time period, spent time, etc.
4.	Number of customers	Only total number.	Show full customer information, compares customers and creates diagnostic diagrams in several minutes.
5.	Flexibility	Has a number of parameters, which can be modified according to the task.	Has a variety of actions and parameters, which makes work easier and reduces time.
6.	Information accuracy	According to surveys it is 87%	According to surveys it is 96%

Source. Compiled and systematized by the author based on the own research

Suppliers analysis is important first of all to reduce purchase risk and maximize the overall value of the purchaser. It typically involves evaluating, at a minimum, supplier quality, cost competitiveness, potential delivery performance and technological capability. All this factors can be evaluated with a new information system usage.

The most important condition for the development of commercial activities of scrap suppliers is adherence to market conditions, dynamics of prices for the purchase and sale of goods.

Consumer analysis helps marketing research professionals determine the wants and needs of their consumers. It also reduce campaign costs by streamlining campaigns

to target only the customer base that is most likely to respond. It optimizes the overall customer experience by creating personalized selling and marketing strategies for the different customer segments. And helps not to waste time with clients who are not likely to buy [30].

With the possibility of a free search for sellers and buyers, a medium-sized wholesale company needs to plan business relations as competently as possible. All relationships are built on a contractual basis. The contract is the main economic and legal evidence of the fact of the purchase and sale transaction.

Labor analysis helps not only helps it find the most qualified workers for the jobs that it offers but also ensures that it provides a competitive compensation package to its workers. Rational actions according workers results can make a competitive environment in the enterprise and help to enlarge a number of customers.

In the area of work with personnel, additional personnel training is offered. It is impossible to consider a trading enterprise on the one hand. It is impossible to isolate the enterprise from the external environment, since it is the factors of the external environment that have a significant impact on the nature of the company's activities [31].

Number of customers also plays an important role in a marketing campaigns and helps enterprise's reputation. As we know, reputation ultimately determines company's future multiplying in enlarging its income.

Flexibility must be able to accommodate a certain amount of variation regarding the requirements of the supported business process. Though there are numerous studies conducted earlier on the flexibility of organizations, processes, and various organizational technologies, the economics of flexibility are not yet well agreed [10].

Information accuracy is important to ensure that the information is correct and without any mistake. In the absence of accurate, reliable and timely information, people and organizations will make bad decisions. And it is the important part of information system work – to provide accurate information on time. Information system

management directly depends on information, its transformation and needed time period.

The competitiveness of a trading enterprise is, first of all, the ability of an enterprise to develop and analyze an entrepreneurial idea and having resources of any nature in a competitive advantage in order to strengthen its place in the market and conquer new niches.

It can be said that competitive advantages are the basis of competitiveness, which must be maintained, developed and improved. These actions help the company to form superiority against the background of competitors and become more in demand among potential partners.

According to results of table 3.1, which contains all important part of information system requirements, it is possible to draw a conclusion, that current information systems needs to be modernized or replaced for a more technologically advanced due to less innovative base that new systems can provide enterprise with. Such decisions are usually taken on meeting of Board of directors, but they definitely need to see which IS can replace the current one and which enterprise's problem it can solve.

3.2 Strategy of management information systems modernization

The development of proposals and recommendations of modernizing and developing strong management information system involves the formation of enterprise development strategy and allows to determine the direction of the enterprise's current systems, taking into account the environmental conditions and the probable nature of their change. It is also necessary to take into account the results of the analysis of competitive advantages of LLC – Enterprise “Prodmashstroy” and the objectives of its activities.

As Leon Cooper said – “The life cycle of information technology is becoming shorter every year. New competitors are disrupting industries by leveraging state-of-

the-moment digital practices and processes. Customer expectations are constantly evolving in an accelerating race for the most advanced, hyper connected, seamless experiences. IT functions are under unrelenting pressure to support leading-edge capabilities such as data analytics, cybersecurity, automated processing, and integration with third-party systems. The easiest way to do this is through platforms that connect everyone to the same cloud-based cross-industry digital infrastructure” [1]. That is why better to choose new and modern product and replacement strategy to follow it up.

Choosing a new strategy of MIS developing is risky and tricky choice due to number of factors. And the biggest of them is a fear to do something wrong. Operations, flexibility, specific tooling, long-term investment and commitment to one technology [11].

Even though technology keeps bringing more flexibility, limitations and constraints still exist. To determine the best choice, multiple areas of focus need to be thoroughly analyzed as the investment you will make will be long-term and be a foundation for all your internal and external services.

Enterprise can't 100% predict what is going to be company's ROI or TCO. And this factor scares them from modernization.

Nowadays information systems market place is full of different systems and has a plenty of decision for any type of business. From the most popular and effective ones each enterprise needs to choose the best one for itself, but according to the LLC – Enterprise “Prodmashstroy” needs and financial situation let's choose the appropriate one.

The international research company Gartner has published the Magic Quadrant in the category of sales management solutions - Gartner Magic Quadrant for Sales Force Automation, 2021. CRM-system Creatio has been presented in this ranking for the sixth year and in the leader sector for the third year [14].

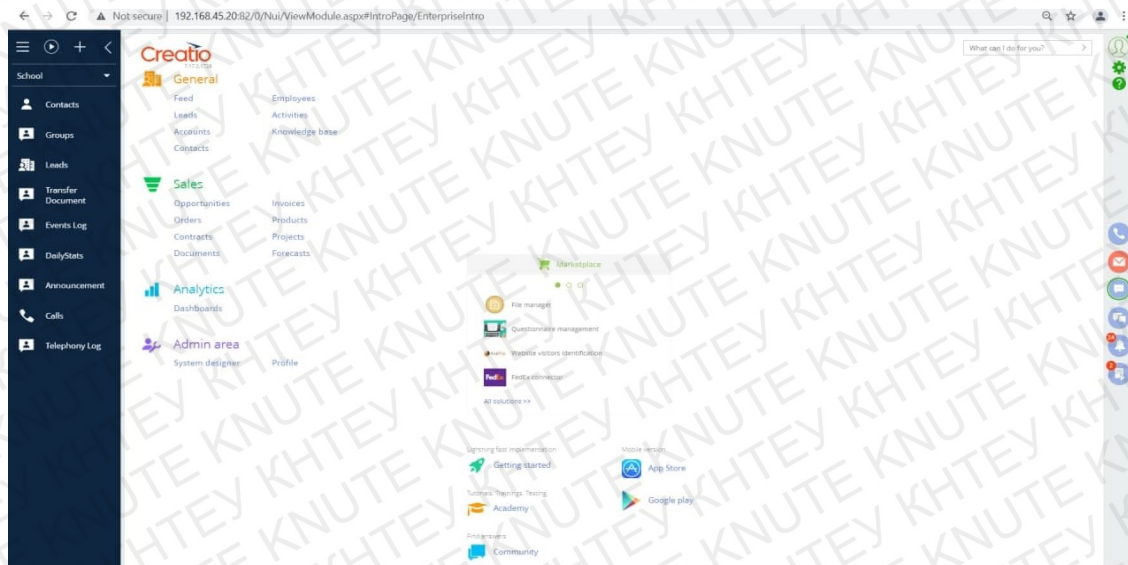


Fig. 3.1 The first page of Creatio information system

The Sales Force Automation (SFA) market continues to grow, according to a Gartner report, growing by 10.9% in 2020. The key trend in the development of the SFA market is the expansion of the capabilities of AI technologies and virtual sales. At the same time, functionality for remote sales using teamwork tools and universal communication tools is becoming an integral part of the SFA technology stack. In general, analysts note that sales automation tools are increasingly transforming from data fixation systems to interaction and analytics systems [32].

Company has completed decisions and variety of templates to choose and reorganize current information system quickly. Advanced integration capabilities (using Net, REST, SOAP, OData, open API tools), as well as a powerful administration and access control system allow you to quickly and safely embed Creatio into the enterprise information environment.

Moreover, Creatio information system matches with all enterprise's task for IS, as it was mentioned before, such as:

- accurate information;
- time limits;
- flexibility and connection with another IS;
- opportunity to modernize;

- good value of money;
- quick replacement;
- administrative simplicity;
- easy training system;
- logical and simple design, etc.

For the design of an enterprise information system in modern conditions are influenced not only by the level of organization of the form of management and means of technical equipment, but also by the latest approaches to the very idea of development and design.

Moreover, Creatio allows you to form a detailed profile for each client, as a result, to build the right interaction tactics to improve the customer experience. Keep a history of communications, segment customers and analyze their preferences and needs to find priority areas for the company's development.

The program also makes it possible to increase the effectiveness of the team through the use of clear regulations at every step of the workflow: from analyzing needs to concluding a deal, fulfilling an order and controlling payments. It is possible to set up your own processes and quickly adapt to meet business requirements - Creatio's low-code platform will provide the required flexibility and speed of change.

The system records all meetings, calls and letters, concluded contracts, sales, orders and invoices in relation to contacts and counterparties. Thanks to this, you can assess the duration and completeness of work with the client, change the tactics of interaction, and draw the necessary conclusions.

Thanks to analytics, managers can make informed decisions based on an analysis of the customer base. The program has the ability to identify key customers according to various criteria, which will help determine the priority areas of the company's development. All you need to do to get the analytics you need is to customize the totals tools with the metrics you want.

Let's make a graphic plan about new IS implementation.

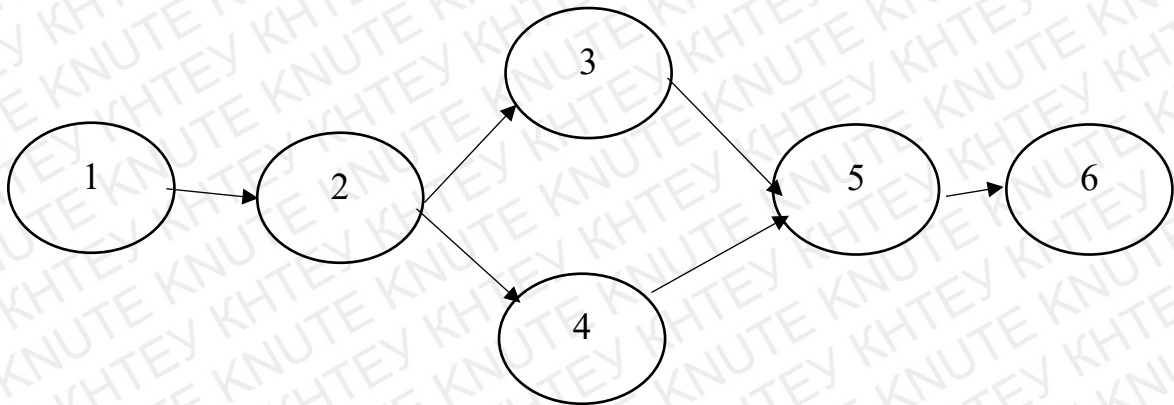


Fig. 3.2 Graphic plan of Creatio project implementation

From the graphic plan, it is easier to divide it into timeline of the project. Timeline helps for better understanding of project stages and its duration.

Project duration is presented in the table below.

Table 3.2

Duration of Creatio project implementation

#	Process	Duration, days
1	Preparation	37
2	Theoretical development	15
3	Experimental part	14
4	Technical reporting	7
5	Employee training	4
6	Final part	5

Source: Compiled and systematized by the author based on the own research

As it can be calculated from the table 3.2, for new project implementation the enterprise will need 82 days. According to companies official data, new project implementation costs 60 000 uan and system should be updated and have technological support timely. $TCO_o > TCO_1$, which means that company reduced expenses for implementation.

Let's make an economic assessment of the offered modernization strategy, because it gives an explanation of what needs to be exactly changed, understanding the whole process and its main stages and a picture of possible impact on economic results of the enterprise and its wellbeing at all after modernization.

If the economic assessment is carried out at the right way, it can be used to force the enterprise on the new level of income and increase public awareness and reputation of the company. Of course, one of the common challenges of making good economic assessments is to measure the specific impacts on the enterprise, its costs, external economic impact, socio-economic impact which are difficult to monetize.

Knowing that today's management information systems is not the main part of controlling the company and its money flows, let's prognose how the economic situation and company's management will change after strategy realization to make an assessment of rationalization of using strategy.

Results of the assessment are presented below:

Table 3.3

**The effect of main tasks solution on the management of LLC – Enterprise
“Prodmashstroy”**

#	Solved task	Effect on the management of the enterprise	Negative/positive effect
1	Accurate information	The reduction of needed time to check the accuracy of the information and to make a decision.	Positive
2	Time limits	Strick duration of any process. Effective control of the employees working hours and the amount of done work.	Positive
3	Connection with other IS	Possibility to transfer all important data and left the 1C usage for accountancy. An opportunity to have quick access to old data.	Positive
4	Opportunity to modernize	Terrasoft company is fixing any issues and modernize system timely, which leads to a faster working system	Positive
5	Good value of money	Saves company's budget and is reasonable in money-quality assessment	Positive

6	Administrative simplicity	Systems support isn't expensive and complicated.	Positive
7	Easy training system	Staff training isn't long and complicated	Positive
8	Logical and simple design	An opportunity to find any function easily and a bonus for workers as an exchange for a possible stress.	Positive

Source: Compiled and systematized by the author based on the own research

To draw a conclusion about changes in company's management, it needs to be mentioned as the main difference of possible one from current one is the level of control and time. For business time is the main course of gaining income. The level of control gives an opportunity to analyze workforce of the enterprise, show the results of work of each employee, and make changes in the staff, if it is needed.

As the strategy of implementation takes 82 days and the economic results can be calculated after 2-3 years of timely control, the enterprise's income is going to grow and be multiplied in several times. The income generated by the new strategy implementation for the LLC – Enterprise “Prodmashstroy” will have a positive effect on the organization's profit. Possible profit indicators of the enterprise are presented below:

Table 3.4

Predicted profit indicators of LLC – Enterprise “Prodmashstroy” for 2021-2024

#	Indicator	2020	2021	2022	2023	2024
1	Net income from sales of products (goods, works, services)	31 163,5	35 342,8	40 069,6	56 768,4	74 278,4
2	Cost of goods sold (goods, works, services)	19 128,1	22 486,9	24 958,2	31 252,1	36 322,1
3	Gross profit (loss)	12 035,4	12 855,9	15 111,4	25 516,3	37 956,3

Source: Compiled and summarized by author based on own research

According to the table 3.4 the enterprise's profit will be 74 278,4 uan at the end of 2024. According to the probability theory, the new strategy can multiply current income of the enterprise by 2,4 in 4 year, So at the end of 2024, the enterprise will receive net income of 74 278,4 uan.

The dynamics of predicted profit indicators of LLC – Enterprise “Prodmashstroy” is presented below:

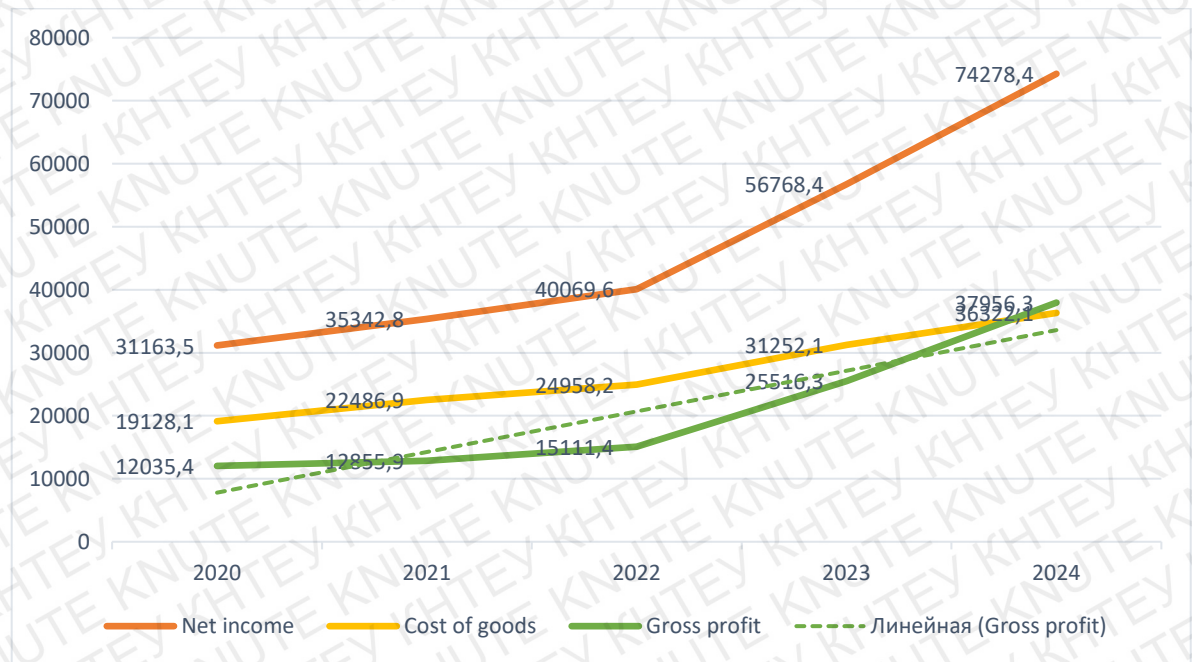


Fig. 3.3 Predicted profit indicators of LLC – Enterprise “Prodmashstroy” for 2021-2024

The obtained data allows to draw a conclusion that there is an economic feasibility of implementing new IS to improve management information system of the trade enterprise LLC – Enterprise “Prodmashstroy”.

Of course, company's management needs to think over the implementation because it is not a cheap project. However looking on the possible changes and growth and the facts from research, here is no doubt that this implementation will enlarge enterprise's income and improve its management information system.

The introduction of an automated information system should to promote the efficiency of production and economic activities, economic facilities and ensure the quality of management.

The effectiveness of the proposed measures for the company gives an idea of the strengths and weaknesses of its activities, internal capabilities, potential. Strengths of activity are the basis of the enterprise for development of competitive advantages. As for weaknesses, management should do everything possible to strengthen them.

CONCLUSIONS AND RECOMMENDATIONS

As a result of research (project), the strategy of development management information systems was developed, which is aimed at increasing profit and improving the level of control at the LLC – Enterprise “Prodmashstroy”. To achieve this goal in the final qualifying paper, the theoretical aspects of analysis and improvement of the management information systems at the trade enterprise were analyzed.

The characteristic of the trading enterprise "LLC – Enterprise “Prodmashstroy” is presented and the analysis of financial and economic activity results is carried out in the main text of work. The analysis of current management information systems of the "LLC – Enterprise “Prodmashstroy” was carried out and its efficiency was assessed.

Based on the analysis, proposals aimed at improving the management information systems of a trading enterprise were formulated in order to ensure the growth of enterprise’s profit and the feasibility of proposal’s implementation were assessed.

The trading enterprise "LLC – Enterprise “Prodmashstroy” carries out trade activities of chemical products supply, cargo transportation, windows production, real estate renting out, computer diagnostics and repair of commercial vehicles and ownership of fishing and hunting grounds “OKNINO” in Sevierodonetsk since 1994.

Analysis of economic activities based on balance sheet data of trading enterprise "LLC – Enterprise “Prodmashstroy” showed that the organization is not active in developing management information systems. The net profit of the organization at the end of 2020 reached 31 163,5 thousand UAN. This analysis led to a conclusion of an irrational usage of enterprise’s resources.

Based on the results of the study, the investigated period of the organization is characterized by a decline in development of management information systems and profit growth. The implementation of a new strategy of development MIS needs to be with investments and foreign enterprises’ experience.

Qualitative assessment of the management information systems of "LLC – Enterprise “Prodmashstroy” reflects the fact that the enterprise underutilizes the available development potential. Current information management systems is not developed and can't be a part of control tool at the trade enterprise.

From the analysis we have reached the conclusion that management information system is very helpful to enhance performance of the organization in the sense of profitability, innovation, and growth.

- The MIS satisfies the diverse needs through variety of systems such as query system, analysis system, modeling system and decision support system.
- The MIS helps in strategic planning, management control, operational control and transaction processing.
- The MIS helps in the clerical personal in the transaction processing and answers the queries on the data pertaining to the transaction, the status of a particular record and reference on a variety of documents.
- The MIS helps the top level management in goal setting, strategic planning and evolving the business plans and their implementation.
- The MIS plays the role of information generation, communication, problem identification and helps in the process of decision-making.

MIS professionals are able to play a key role in areas such as information security, integration, and exchange. As an MIS major, you will learn to design, implement, and use business information systems in innovative ways to increase the effectiveness and efficiency of your company.

Working with innovative, progress and multi-functional information system helps to improve enterprise's working environment and create a healthy management of informational system. As it was mentioned previously, enterprise's success is directly connected with its initial process and its reputation, which is very important to stay in the market place.

Management information systems have sophisticated mathematical analysis tools that can evaluate relationships and calculate probable future trends. Sometimes, the information and trends display an evolving situation that the company wants to change. Management information systems can evaluate different possibilities and allow you to examine scenarios. Management information systems calculate what happens based on their collection of data on how the company operations performed in the past.

As part of the study of the financial and economic feasibility of the proposed measure, an organizational and financial plan for its implementation was drawn up and the key parameters of the project payback were determined. As a result of the calculations, it was determined that the implementation period of the project will be 82 days. The project efficiency can be calculated in 2-3 years. For the forecast years, the implementation of the project will bring the trade enterprise "LLC – Enterprise "Prodmashstroy" a net income of 74 278,4 thousand UAN. The profitability of project, calculated as the ratio of income to the cost of its implementation, will be 123,8 %.

Thus, the implementation of an effective strategy for the development of management information system of LLC – Enterprise "Prodmashstroy" allows to ensure highly efficient business activities, competitiveness of the enterprise, as well as the formation of a strategic plan for its development in today's changing environment and stay flexible in front of pandemic in the world.

Analysis of the effectiveness of the implementation new information system for LLC – Enterprise "Prodmashstroy" showed the feasibility and profitability of this project.

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APPENDICES

Appendix A

THE IMPORTANCE OF INFORMATION SYSTEMS AND ASSESSMENT OF ITS EFFICIENCY AT THE TRADE ENTERPRISE

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Визначено мету та важливість використання управлінських інформаційних систем на торговельному підприємстві. З'ясовано роль управлінських інформаційних систем, їх вплив на економічну продуктивність та вплив на рівень конкурентної спроможності компанії на ринку. Досліджено критерії оцінки ефективності інформаційних систем.

Ключові слова: інформаційні системи, управління, управління інформаційними системами, торговельне підприємство, інновації, розробка інновацій.

Determined the aim and the importance of using management information systems at the trade enterprise. Identified the role of management information systems, its effect on enterprise's economic productivity and the effect on the level of enterprise's competitiveness at the market. Researched the criteria of MIS efficiency evaluation.

Key words: information systems, management, management of information systems, trade enterprise, innovations, innovations development.

Problem statement. Running a large trade enterprise is not only stressful, but also time-consuming and complicated due to lots of decisions that should be taken, organizing work environment and keeping work at all levels under control, which requires reliable top managers, and well-organized management of information systems.

One of the main reasons of business decline could be its inner processes such as not clear and well-organized information flows, employees work and connections between owners and employees. All of this affect enterprise work and its income and competitiveness on the global and domestic market. Such problems are actual at the domestic enterprises due to lower innovations level, fewer opportunities amount and obstacles for management information systems in Ukraine.

Problematics of the importance and efficiency evaluation of management information processes, problem solving and development of methodological and practical principals were studied by lots of scientist such as: M.E. Porter, E.A. Didenko, M. Išoraitė, V.V. Melnyk, H.T. Piatnytska, Z.M. Zadorozhnyi, Y. Sudyn and others.

Despite a huge amount of researches, the theme of studying MIS and its development in management information systems still needs to be studied.

The aim of the article is to analyze the importance of information systems for trade company and to find out the evaluation criteria of management information systems assessment due to sphere of its usage.

Research results. Most trading enterprises use lots of different economic and technological tools to keep developing, multiplying its businesses and increasing competitiveness. Competitiveness, in general, can be referred as a complex of comparative characteristics, which reflects the degree of advantage over other enterprises with the set of performance evaluating indicators for a certain period of time[1]. It makes the enterprise known at the market and keeps it save from competitive forces[4].

Productive software such as word processing, spreadsheets, graphics, different PC programs, adopted to a company's specific work, a variety of tasks and, of course, management information systems (MIS) could be named as an example of working tools. It is not a secret, that running successful and competitive trade company demands from its top executive managers to use only that tools that are able to support processes, operations, intelligence, and MIS part at the trade enterprise. These tools are core in management information systems which helps to move data, keep it save and organized and to manage wide information flows.

Staying in touch with your workers, making information shearing easier and updating your employees with the latest tasks are the basics of productivity and give an access to useful information. In addition to a huge amount of work, done by MIS, also gives an opportunity to receive reports of done work and as a result helps top managers or owners make the right persevering decisions at the right time. The most common objectives and its purpose of MIS are mentioned below:

Table 1

Common objectives of management information systems

#	Objective	Purpose
1.	Data storage	Keeping data organized and ready for future usage.
2.	Data extraction	The ability to add, delete, change and take out data whenever it is needed for usage.
3.	Data access	The ability to access and share data thought enterprise's network with users of different levels.
4.	Efficient and effective planning	Quick and permanent access to necessary information, that helps with strong decision-making and strategy planning.
5.	Different types of report/statistics	Gives a clear picture of current performance of different parts of enterprise.
6.	Enterprise control (control over workers)	Provides the latest information, which can be sort by different filters (for ex. Client, supplier, employee, data, product, etc.)

Table 1 continuation

7.	Accounting	Budgeting, expenses, income and all the transactions under control.
8.	Notifications/history keeping	Gives an opportunity to set up different levels of access and receive message of roots breaking/keeping activity history.
9.	Keeping warehouse	Warehouse activity and actual information.
10.	Clients/suppliers base	Keeping information about clients and suppliers and activity history of each of them.

Note. Compiled by the author

Basically, all enterprises use not only one information system that allows to analyze data, control reporting, identify needs and problematic aspect. Enterprises, mostly, use several of them. Each of these systems give an ability to make decisions at different levels about strategy, innovations and so on. As a rule, management of trade enterprise in Ukraine is running with the help of 1C systems. It can be modified according to different types and specification of the work of trade enterprise. Such program gives a clear picture of inner and out-going processes of enterprise: information systems recording, tracking the transactions, transmitting the data to the necessary places, keeping warehouse processes under control, preparing financial reports, analyzing the current state of affairs at the enterprise and, the most important, keeping client and suppliers base save.

Once, Porter M. E. the American academic professor of Harvard Business School, known for his theories on economics, business strategy, and social causes, said: - "Competitive advantage grows basically from the value an enterprise is able to create to their customers and keep it. Customers are willing to pay for enterprise's value and the main value comes from offering lower prices than your competitors for equivalent benefits and products, or for providing some unique benefits and products that can worth higher prices." [5]. This phrase means, that all used tools should increase enterprise's competitiveness. That is why running enterprise with appropriate MIS, gives a competitive advantage firstly, in time, because executives can quicker react on changes and new market rule. [3] Secondly, it gives an ability to forecast expenses and to be prepared for it. Thirdly, helps to understand and manage their customers better. Moreover, it is necessary to admit, that MIS is able to carry out automated monitoring of goodwill elements and to generalize costs to determine the cost, which will be the estimated value [6].

By admiring high results, most of the executives often forget about keeping under control amortization, innovations and effectiveness of MIS. Without checking it time-to-time there is a risk to be in situation when enterprise's income and work force is reducing and there is no explanation of it happening in the middle of economic growth. To avoid such situations Didenko E.A. and M. Išoraitė suggest to evaluate management information systems timely [1;2].

It is explained by Didenko E.A., that each management of information systems' effectiveness should be evaluated to determine whether it is effective or not[1]. Evaluation of MIS is its organizational and functional assessment according to innovations and amount of information. The most common characteristics to evaluate the management information systems are presented in the table below:

Table 2

Management information systems assessment criteria

1.	Technical assurance	quality	Analysis of MIS technical quality performance.
2.	Reliability		The main indicator of assessment, as the value of information is usually determined by the precision of the data.
3.	Timeliness		Information is available for decision-makers in time.
4.	Cost/benefit-based evaluation		Comparing of the expenses, expectations and the received results. The assessment of cost/benefit determines the system's cost-effectiveness.

Note. Compiled by author based on [2]

Evaluating MIS according different criteria, advantages and disadvantage of MIS and the results caused by its disadvantages can be determined. Due to this assessment, executives can make decisions about innovations implementations or reorganization of the enterprise, which might help to improve the situation and reduce caused damage.

Conclusion. As it was mentioned earlier, the aim of the management information systems usage is to make top executives life easier. In other words, to help top positioned managers to make decisions, according to enterprise's strategy, in advance and to keep control over the enterprise's running. Such steps always help to be for one step ahead from enterprises-competitors and to won some time to think and change the state of affairs.

From everything mentioned above, we also can determine the importance of continuous improvement of MIS for trading enterprises, which directly connected with multiplying the income of the enterprise and growth of its competitiveness. This connection shows, that by improving management information systems and by implementing innovation, the enterprise can improve its performance, help executives with decision-making and to reach dreamed competitiveness at the marketplace.

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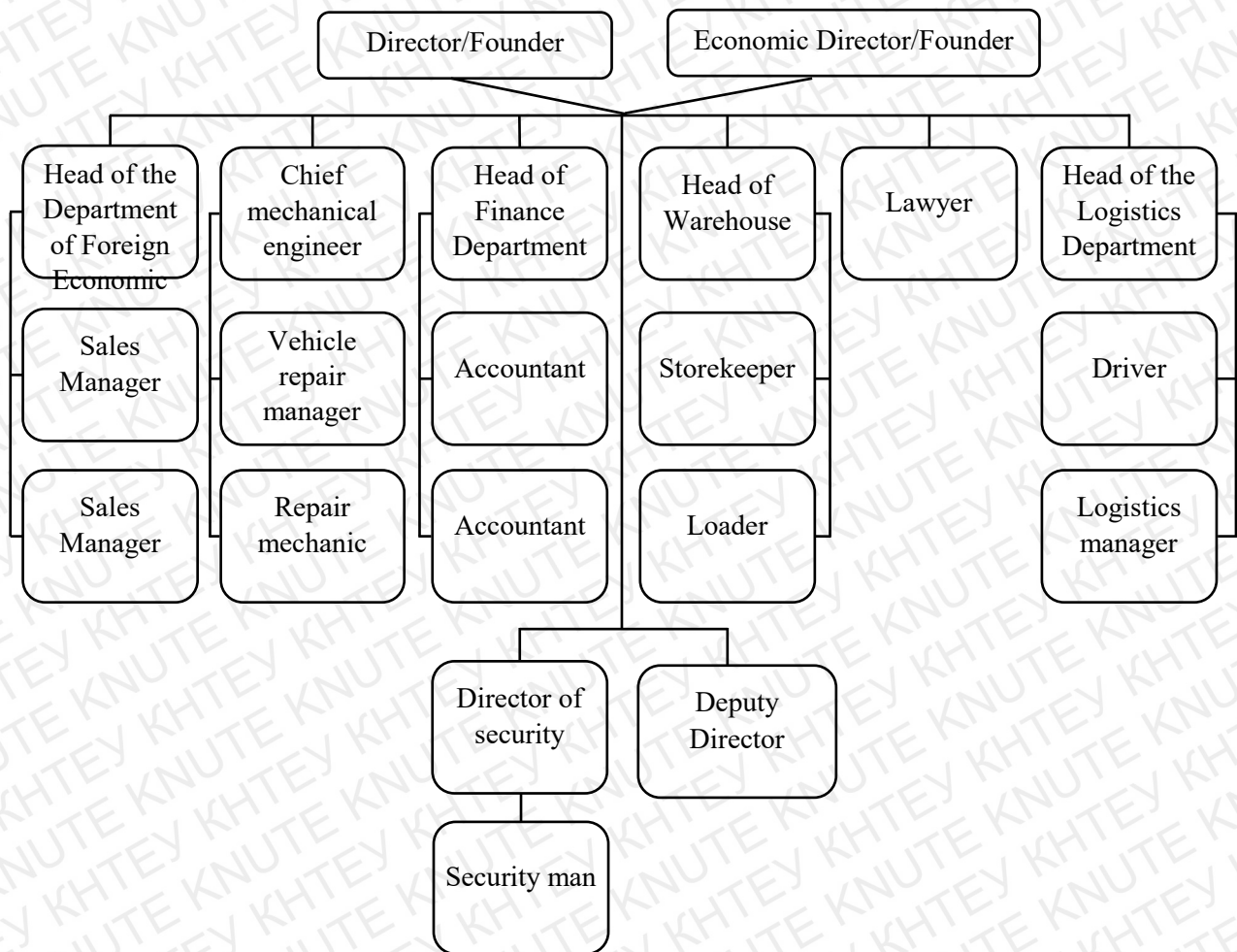
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A. PRISYAZHNYUK.

Part of the market	Whole market	Leadership	
		Based on lowest-cost	Based on differentiation
	Segment	Focusing	
		Based on lowest-cost	Based on differentiation
		Scale of production	Product uniqueness
Competitive advantages			

Figure B.1. General competitive strategy of Porter M [26]



**Figure A.1. The organizational structure of LLC – Enterprise
“Prodmashtroy”**

Appendix D

Table D.1

**Consolidated Balance sheet of the enterprise (assets) LLC – Enterprise
“Prodmashstroy” in 2016-2020**

Indexes	Year				
	2	3	4	5	6
1	2016	2017	2018	2019	2020
Incomplete capital investments	66,7	195,3	70,5	82,9	539,4
Fixed assets:	6 471,2	7 152	7 385,3	5 632,8	5 870,1
Long-term financial investments, which are accounted for using the equity method of other enterprises	321,3	295,3	295,3	295,3	295,3
NON-CURRENT ASSETS	6 859,2	7 642,6	7 751,1	6 011	6 704,8
Final product	0	0	0	937	948,2
Stocks	2 764,3	2 884,5	1 751,1	2 368,6	3 129,5
Accounts receivable for products, goods, works, services	2 183,9	2 289,8	2 414,1	1 126,7	3 099,4
Accounts receivable according to budget calculations	116,7	585,5	580,8	304,2	121,1
Other current receivables	4 618,5	2 943,3	2 335,8	4 069,2	2 442,8
Money and their equivalents	2 237,1	850	590,9	1 288,7	394,1
Deferred expenses	170,5	115,2	157,5	95,7	75,8
Other current assets	3,9	33,2	9,8	142,5	520,5
CURRENT ASSETS	12 094,9	9 701,5	7 840	9 395,6	9 783,2
BALANCE	18 954,1	17 344,1	15 591,1	15 406,6	16 488

Table D.2

**Consolidated Balance sheet of the enterprise (liabilities) LLC – Enterprise
“Prodmashstroy” in 2016-2020**

Indexes 1	Year				
	2	3	4	5	6
	2016	2017	2018	2019	2020
Additional capital	290,8	290,8	290,8	290,8	290,8
Reserve capital	370,4	370,4	370,4	370,4	370,4
Retained earnings (uncovered loss)	11 852,2	11 421,5	9 823,8	9 483,4	9 513,2
EQUITY	14 713,4	14 282,7	12 685	12 344,6	12 374,4
Short-term bank loans	0	0	0	0	83,3
Current accounts payable for goods, works, services	2 142,7	1 712,9	1 156,8	333,9	578,3
Current accounts payable according to budget calculations	71,3	34,6	0,3	28,3	34,7
Current accounts payable according to insurance calculations	26,4	30,1	27,8	29,3	29,1
Current accounts payable	175,7	94,7	59,3	75,1	54,3
Other current commitments	1 824,6	1 189,1	1 661,9	2 595,4	3 333,9
CURRENT COMMITMENTS AND SECURITIES	4 240,7	3 061,4	2 906,1	3 062	4 113,6
BALANCE	18 954,1	17 344,1	15 591,1	15 406,6	16 488

Table D.3

**Consolidated Report on the financial results of the enterprise LLC – Enterprise
“Prodmashstroy” in 2016-2020**

Indexes	Year				
	2	3	4	5	6
1	2016	2017	2018	2019	2020
Net income from sales of products (goods, works, services)	49 888,1	78 562,1	52 090,3	32 581,8	31 163,5
Cost of goods sold (goods, works, services)	35 938	61 124,3	36 660,3	19 653,8	19 128,1
Gross profit (loss)	13 950,1	17 437,8	15 430	12 928	12 035,4
Other operating income	507,6	938,7	723,8	408,2	1 065,5
Other operating expenses	11 905,6	17 366,7	16 707,7	14 217,4	13 158,6
Financial result from operating activities: profit (loss)	2 552,1	1 009,8	-553,9	-881,2	-57,7
Other income	30,6	100,7	144,3	108,8	88,7
Other expenses	214,9	0,4	26,1	0	0
Pre-tax financial result: profit (loss)	2 367,8	1 110,1	-435,7	-772,4	31
Expenses (income) from income tax	431,3	46,3	0	0	5,6
Net financial result: profit (loss)	1 936,5	1 063,8	-435,7	-772,4	25,4

Continuation of table E.1

Expenses for hryvnia sales, UAH	0,72	0,78	0,7	0,6	0,61	-0,11	0,01	-	15,28	1,67
The ratio of own working capital stocks	2,84	2,3	2,82	2,67	1,81	-1,03	-0,86	-	36,27	32,21
Coefficient of financial autonomy	0,78	0,82	0,81	0,8	0,75	-0,03	-0,05	-3,85	-6,25	
Current ratio (coverage)	2,85	3,17	2,7	3,07	2,38	-0,47	-0,69	-	16,49	22,48
Absolute liquidity ratio	0,53	0,28	0,2	0,42	0,1	-0,43	-0,32	-	81,13	76,19
Average number of employees, persons	33	32	35	35	31	-2	-4	-6,06	-	11,43
Remuneration fund, thousand UAH	0	0	0	0	0	0	0	0	0	0
Labor productivity, thousand UAH	1 511,76	2 455,07	1 488,29	930,91	1 005,27	- 506,49	74,36	-33,5	7,99	

Table F.1

**Dynamics of assets of LLC – Enterprise “Prodmashstroy” in 2016 - 2020,
thousand UAH**

Indexes	Year					Absolute increment (deviation), +, -		Relative increase (deviation),%	
	2016	2017	2018	2019	2020	2020 / 2016	2020 / 2019	2020 / 2016	2020 / 2019
Incomplete capital investments	66,7	195,3	70,5	82,9	539,4	472,7	456,5	708,7	550,66
Fixed assets:	6 471,2	7 152	7 385,3	5 632,8	5 870,1	-601,1	237,3	-9,29	4,21
Long-term financial investments, which are accounted for using the equity method of other enterprises	321,3	295,3	295,3	295,3	295,3	-26	0	-8,09	0
NON-CURRENT ASSETS	6 859,2	7 642,6	7 751,1	6 011	6 704,8	-154,4	693,8	-2,25	11,54
Final product	0	0	0	937	948,2	948,2	11,2	0	1,2
Stocks	2 764,3	2 884,5	1 751,1	2 368,6	3 129,5	365,2	760,9	13,21	32,12
Accounts receivable for products, goods, works, services	2 183,9	2 289,8	2 414,1	1 126,7	3 099,4	915,5	1 972,7	41,92	175,09
Accounts receivable according to budget calculations	116,7	585,5	580,8	304,2	121,1	4,4	-183,1	3,77	-60,19
Other current receivables	4 618,5	2 943,3	2 335,8	4 069,2	2 442,8	-2 175,7	-1 626,4	-47,11	-39,97
Money and their equivalents	2 237,1	850	590,9	1 288,7	394,1	-1 843	-894,6	-82,38	-69,42

Continuation of table F.1

Deferred expenses	170,5	115,2	157,5	95,7	75,8	-94,7	-19,9	-55,54	-20,79
Other current assets	3,9	33,2	9,8	142,5	520,5	516,6	378	13 246,15	265,26
CURRENT ASSETS	12 094,9	9 701,5	7 840	9 395,6	9 783,2	-2 311,7	387,6	-19,11	4,13
BALANCE	18 954,1	17 344,1	15 591,1	15 406,6	16 488	-2 466,1	1 081,4	-13,01	7,02

Table G.1

**Evaluation of liquidity of the balance of LLC – Enterprise
“Prodmashstroy” in 2016 - 2020**

Indexes	Year					Absolute increment (deviation), +, -		Relative increase (deviation),%	
	2016	2017	2018	2019	2020	2020 / 2016	2020 / 2019	2020 / 2016	2020 / 2019
A1 (cash and current financial investments)	2 237,1	850	590,9	1 288,7	394,1	-1 843	-894,6	-82,38	-69,42
A2 (short-term receivables)	6 919,1	5 818,6	5 330,7	5 500,1	5 663,3	-1 255,8	163,2	-18,15	2,97
A3 (inventories, current biological assets, other current assets, deferred expenses)	2 938,7	3 032,9	1 918,4	2 606,8	3 725,8	787,1	1 119	26,78	42,93
A4 (non-current assets)	6 859,2	7 642,6	7 751,1	6 011	6 704,8	-154,4	693,8	-2,25	11,54
P1 (current accounts payable)	2 416,1	1 872,3	1 244,2	466,6	696,4	-1 719,7	229,8	-71,18	49,25
P2 (short-term bank loans, deferred income, other current liabilities)	1 824,6	1 189,1	1 661,9	2 595,4	3 417,2	1 592,6	821,8	87,28	31,66
P3 (long-term liabilities and collateral)	0	0	0	0	0	0	0	0	0
P4 (equity, etc.)	14 713,4	14 282,7	12 685	12 344,6	12 374,4	-2 339	29,8	-15,9	0,24
A1-P1	-179	-1 022,3	- 653,3	822,1	- 302,3	-123,3	-1 124,4	68,88	-136,77
A2-P2	5 094,5	4 629,5	3 668,8	2 904,7	2 246,1	-2 848,4	-658,6	-55,91	-22,67
A3-P3	2 938,7	3 032,9	1 918,4	2 606,8	3 725,8	787,1	1 119	26,78	42,93

