

## **IMPROVING OF THE INFORMATIONAL SYSTEMS OF RETAIL REAL ESTATE RENT ACCOUNTING AND MANAGEMENT**

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**Introduction.** The state of Ukrainian economy is getting worse. This is caused by the country losing part of its territory, high inflation rate and the constant increase in communal services rates, as well as other reasons. As a result, the purchasing power of Ukrainians is lowering as well.

At the same time, retail real estate is still a viable and promising option for investment. Although this sector of Ukrainian economics has hit a bottom value in 2014, the following years indicate a possibility for cautious optimism regarding retail real estate.

Developers are not in a hurry to invest in new projects, mostly, they focus on improving already existing projects. Today retail real estate offers an attractive income rate, supported by a similar level of risk.

The share of discount stores in the world is constantly growing, as well as the share of shopping malls, which already hold about 50% of the retail real estate market in Europe. In Ukraine's circumstances, the discount stores' part is taken by a variety of markets. Markets are the most common choice as a trade and retail object in most of the country. The retail real estate market exists primarily in cities that have shopping mall networks from Ukrainian and foreign brands.

Thus, in the current unstable political and economic situation, it is a relevant task for entrepreneurs to implement a new mechanism of organizing the workflow by making the rent accounting system automatic to improve its efficiency and financial stability.

**Analysis of recent scientific works and publications.** Many Ukrainian and foreign scientists have analyzed the management systems of retail real estate. In most cases, the authors deal with specific issues of the retail real estate management system and determine the investment attractiveness. In scientific works [1, 2] the authors have a critical overview of the organizational and methodological basics of accounting rent operations and managing retail real estate in Ukraine. One of the analyzed articles contains [3] a classification of real estate by criteria of investment and operational real estate as objects of management. The necessity of creating an effective retail real estate management system, as well as implementing modern IT into the economy is explained in cited sources [4, 5].

The special theoretical and practical aspects of implementing a modern system of capital asset accounting are reviewed in the publications [6, 7]. The scientific publications explore the applied use of innovative computer technologies to analyze the real estate market [8]. The project algorithm for developing a data base (DB) of the relational type is shown in the publications [9 – 11].

Regardless, there is a need to determine new ways of using modern computer technologies to improve the retail real estate management information systems to increase the speed of data processing in order to be able to adequately predict the volumes of income from rental payments.

**Problem statement.** The aim of this project is to analyze the retail real estate market and to develop an automated real estate rent accounting system.

**Main results.** Retail real estate is a kind of commercial real estate, which is meant to provide a place for retail and wholesale trade as well as a location where entrepreneurs could provide services. In recent years, the most active software developers have been from countries in Central and Eastern Europe, mainly Romania and Poland. In terms of construction activity, Turkey is a clear standout, with cities like Ankara and Istanbul having planned for 35 and 17 new retail real estate projects to have finished in 2017 respectively.

By the beginning of 2016, the total volume of the retail real estate market in Europe was approximately 123 million m<sup>2</sup> (square meters). The most popular real estate market is Germany, with the UK

being second and France holding third place. Germany is attractive to retailers thanks to having over 30 cities with high payment power. The UK and France also have several cities with a big quantity of high quality retail real estate [12].

The factors that have influenced the development of the retail real estate market are the improvement of the world economic situation and increase in customer trust towards the market. The expected world GDP growth is estimated at around 3,4%, which is a peak value since 2011.

In recent years, Ukraine has been changing its consumer strategy towards domestic consumption, which would speed up the stabilization of the national economy. However, a variety of interior and exterior factors haven't allowed for an increase in the population's paying power.

The development of the retail real estate market depends on the overall economic situation in the country. If in 2015, the unrented space in big shopping malls took about 40–50% of the total available space, in 2016 the value of this indicator is fluctuating around 5–10%.

Ukrainian real estate owners try to fulfill as much renter needs as they can by providing the best available renting and operation conditions. The owner-renter communication is individual and lenient relative to the renters, applying where possible:

- discounts;
- fixed dollar exchange rate;
- payments of a share of sale turnover;
- rent payment in national currency (UAH);
- repairs compensations.

Mainly, rent payments depend on factors like location and size of the shopping capacity in question, as well as the location and attendance of the shopping mall. Although in recent years, some additional factors have appeared that have a significant impact on the size of rent payment. The factors include:

- the economic situation in the country;
- the volatility of the UAH;
- a decrease in population paying power;
- a low investment attractiveness of national retail real estate objects.

The most important function of trade is complete satisfaction of demand, in some cases increasing it and in others, creating it. Ukrainian developers are looking for extra resources to commit them to projects that were put on hold in past years. The retail real estate market has stabilized in recent years. 12 shopping malls have been built in Ukraine in 2016 with total sales area about 220 00 square meters. In some towns, first professional shopping malls with an anchor type of trade and entertainment have opened for the first time. Also, there is an increasing tendency in recent years for customers making the switch towards more professional types of trades thanks to new, modern and comfortable shopping malls with a wide range of shops, entertainment and services. At the same time, people in small towns and villages still buy and sell products in markets.

Poltava is one of the most saturated by retail spaces cities with population under 500 000. The leaders in terms of quantity and customer loyalty are shopping malls «Kyiv» and «Ekvator». The trade network in the city is constantly growing and there are over 1 500 registered shops.

A significant part of consumer spending from household income (about 70%) should have gone towards new projects, but instead it is mostly spent towards deferred expenses because of the unstable political and economic situation. Retail chain owners have also cut their development plans in the region.

That being said, a significant part of trade in Poltava is the Central Market, with about 70% of purchases in the city being made there. This shows that markets are a popular choice for the population of the city.

A market is defined as a subject of economy, created on a designated by the local authorities' parcel of land. It must be registered in the proper order and its main function is to provide services and comfortable conditions for customers and salesmen to execute trade operations using prices that are the result of a balance between supply and demand. Market operations are regulated by legislative standards of the central executive body regarding economic policies, as well as organizations, authorized by the central government body to protect consumer rights, standardize and solve metrology related issues.

Markets in Ukraine can be categorized by different types of ownership, subordination and specialization. In recent years, there are more and more markets of a varied type, as well as more vacancies in this sector of economy.

In terms of operational independence, there are markets that are fully autonomous and have the rights and functions of a legal entity, and markets that are branches, which provide local trade platforms where

necessary. Based on trade specialization, markets are either specialized (groceries, car parts, clothes) or universal (groceries-clothes, groceries-plant seeds, etc.). According to sizes, markets are mini, medium or large. Indicators for that level of categorization are market space and net retail area.

The most popular markets in Poltava are the Central Market, «Almaznyi» Market, «Motel» Market, «Polimpex» Market and «Step» Market.

The «Almaznyi» Market is of a universal kind with a wide array grocery and other products up for trade. There are roofed pavilions with dairy and meat products, sections with fruit and vegetable, and a sector with clothes, shoes, instruments, lighting and plumbing wares, etc. There are a few cafes here.

The total area of the market is 24 100 square meters. From 2014 onwards, the project bare maintenance costs for a trade spot sized 1 square meter are 1,16 UAH daily. If we also take into account 10% price up for profit and 20% sales tax, the cost of maintenance sums up to 1,55 UAH daily. This is the lowest price among all the markets in the city, despite the increase in minimal wages, public services, taxes etc.

However, to optimize the trade complex’s working conditions, to increase the quality of service and improve the speed of data processing in order to improve the management decision making process, we suggest an information software overhaul for the company «Step» that is the market’s owner. In order to achieve this goal, an automatic accounting system for real estate rent for the objects that are situated on the territory of the market.

After having done research on the existing accounting system, a structure for the data base management system (DMBS) was created in Microsoft Access 2010. The database consists of 11 different tables: types of work; locations; state of rent; job titles; types of real estate; employees; lessees; worker allocation by buildings (parcel of land); real estate; rent accounting; rent archive.

Every table field is defined with a type of data that will determine the kind of information stored in it. After that, size and key fields are determined to create the initial database keys. An example for the specifics for several tables can be seen in Table 1.

Set relation links between the tables, as shown on Figure 1.

A user interface was also developed. The master form (Figure 2) has a hyperlink to other forms and reports, as well as a link to a bar graph with rent payments by real estate types by quarters. Slave forms are used to show real estate that is available for booking or rent, as well as to show the list of real estate already in rent as a list.

**Table 1**

**Specifics of the table entries in the database**

№	Table	Field	Types of data	Length	Null tolerance
1	Types of work	ID_vidd	Counter	Long whole	No
		Type of work	Text	255	
2	Locations	ID_misto	Counter	Long whole	No
		Location	Text	50	
3	States of rent	ID_stan	Counter	Long whole	No
		State of rent	Text	255	
4	Real estate	ID_nm	Counter	Long whole	No
		Real estate type	Numbers (lookup wizard)	Long whole	
		Building name / ID of the land parcel	Text	255	
		Area, m <sup>2</sup>	Numbers	Long whole	
		Daily operational rate for 1 m <sup>2</sup>	Numbers	Double with a fluctuating point	
	State of rent	Numbers (lookup wizard)	Long whole		

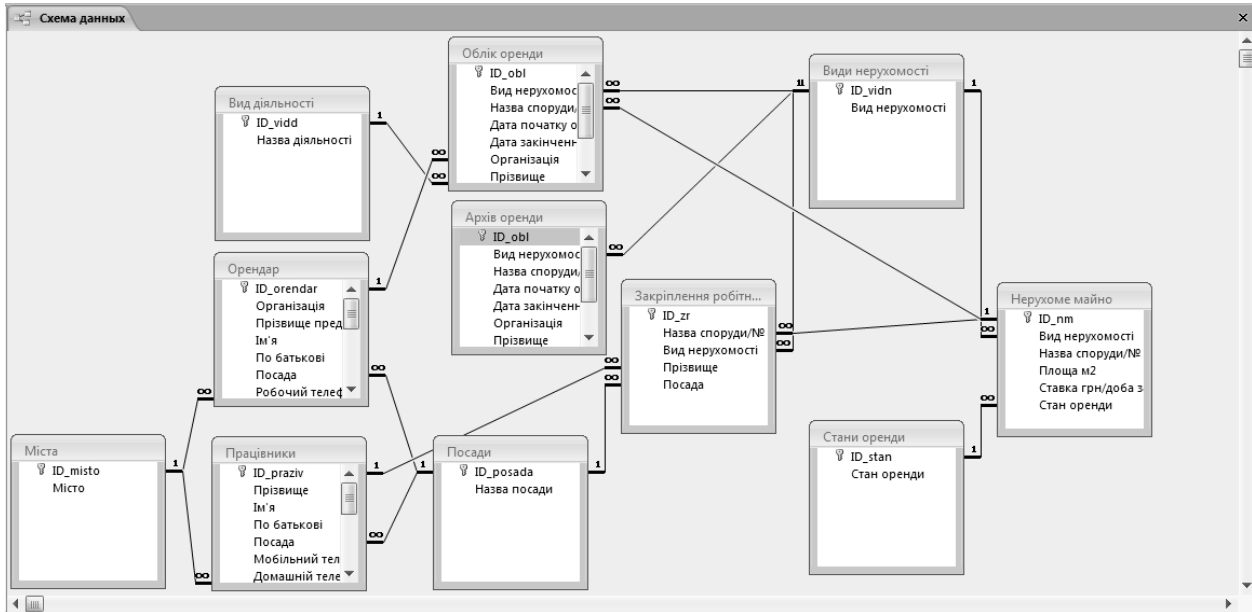


Fig. 1. DB scheme

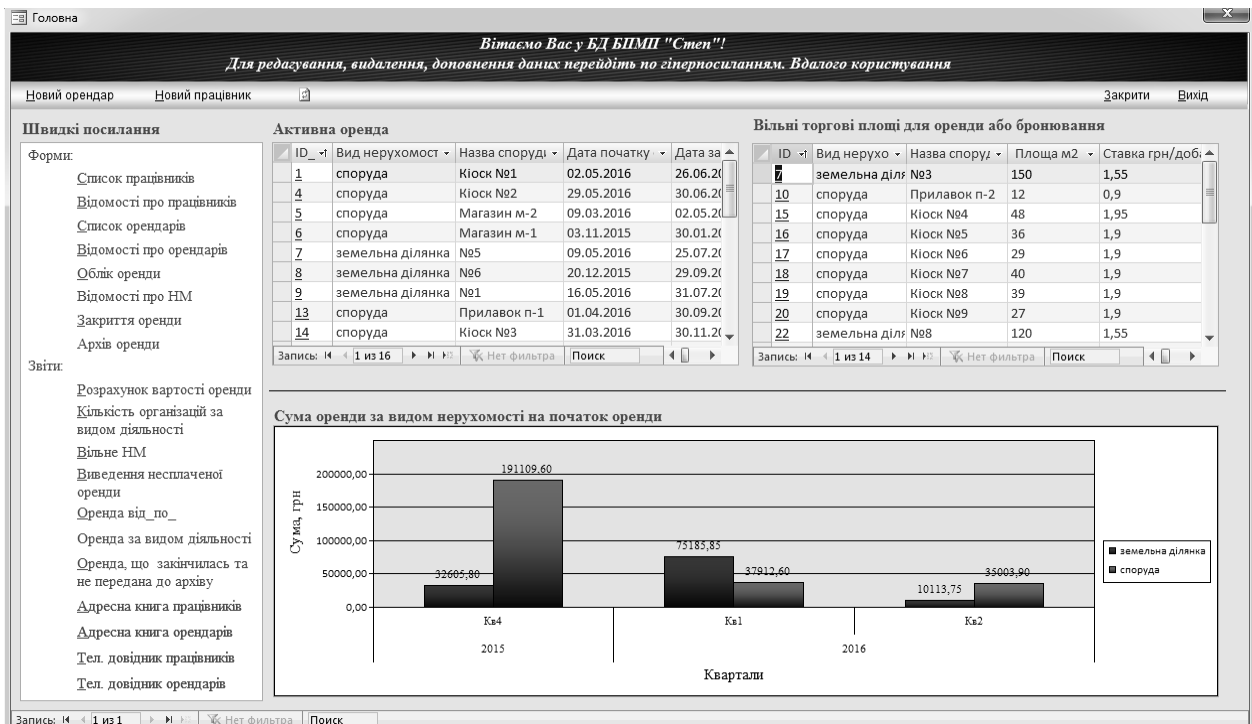


Fig. 2. Master form of the DB

Using the hyperlinks in the slave forms, you can also get the full details about rent or real estate objects from the DB. Also the master form has buttons to add a new employee or lessor, as well as buttons to refresh or close the form and a button to exit the DB.

There were 11 queries and report forms developed, that can be used to rationalize management decisions. The queries were developed via filling the QBE table (template). There are determined sorting criteria and options for the entries that are a result of a query. After that, the DBMS translates the QBE queries into SQL. The report forms are based on the queries and contain the necessary calculations to make a decision. For example, to analyze available for rent real estate, you can use the report form «Available real estate» («Вільне нерухоме майно») (Fig. 3).

Вид нерухомості	Назва споруди/№ земельної ділянки	Площа м2	Ставка грн/доба за 1 м2
<b>земельна ділянка</b>			
	<b>Вільно: 4 загальною площею: 425</b>		
	№10	77	1.55
	№3	150	1.55
	№8	120	1.55
	№9	78	1.55
<b>споруда</b>			
	<b>Вільно: 10 загальною площею: 266</b>		
	Кіоск №4	48	1.95
	Кіоск №5	36	1.90
	Кіоск №6	29	1.90
	Кіоск №7	40	1.90
	Кіоск №8	39	1.90
	Кіоск №9	27	1.90
	Прилавок п-2	12	0.90
	Прилавок п-3	12	0.90
	Прилавок п-4	10	0.90
	Прилавок п-5	13	0.90
<b>Всього:</b>		<b>691</b>	

Fig. 3. Information about the data and quantity of available real estate

The «Rent cost calculation» («Розрахунок вартості оренди») query uses 3 tables rent accounting, real estate, types of real estate. The MS Access 10 Expression Builder was used to make the form for total rent days and total rent cost calculations. A report form for this query is shown on Fig. 4.

Вид нерухомості	Назва споруди/№ земельної ділянки	Площа м2	Дата початку оренди	Дата закінчення оренди	Організація	Сплачено	Кількість днів	Вартість загалом, грн
<b>земельна ділянка</b>								
	№7	42	28.12.2015	21.10.2016	ПрАТ "Диво"	☑	298	19 399,80
	№2	25	01.02.2016	31.01.2017	ПП Шилова	☑	365	14 143,75
	№1	20	16.05.2016	31.07.2016	ПрАТ ВТФ "МТН-ПОЛТАВА"	☑	76	2 356,00
	№4	97	08.02.2016	20.03.2017	ПАТ "АЛД"	☑	406	61 042,10
	№6	30	20.12.2015	29.09.2016	ПрАТ "Комбінат виробничих"	☑	284	13 206,00
	№5	65	09.05.2016	25.07.2016	ПП Федченко	☑	77	7 757,75
<b>Кількість: 6</b>								
<b>споруда</b>								
	Кіоск №1	25	02.05.2016	26.06.2016	ПАТ Мінутка	☑	55	2 612,50
	Магазин м-3	74	01.12.2015	12.10.2016	ПрАТ "Хотин"	☑	316	44 429,60
	Кіоск №2	35	29.05.2016	30.06.2016	ПрАТ "Комбінат виробничих"	☐	32	2 128,00
	Магазин м-2	60	09.03.2016	02.05.2016	ПрАТ ВТФ "МТН-ПОЛТАВА"	☐	54	6 156,00
	Магазин м-1	72	03.11.2015	30.01.2018	ПП Тутей	☐	819	112 039,20
	Магазин м-4	62	01.04.2016	30.11.2016	ПП Хвіч	☐	243	28 625,40
	Магазин м-5	53	15.12.2015	23.11.2016	ПП Василь	☑	344	34 640,80
	Кіоск №3	25	31.03.2016	30.11.2016	ПрАТ "Світлосок"	☑	244	11 590,00
	Прилавок п-1	10	01.04.2016	30.09.2016	ПП Кириченко	☑	182	1 638,00
	Кіоск №10	29	18.01.2016	18.01.2017	ПрАТ "Моршин"	☑	366	20 166,60
<b>Кількість: 10</b>								
<b>Всього:</b>								<b>381 931,50</b>
								<b>Сплачено: 232 982,90</b>
								<b>Забороговано: 148 948,60</b>

Fig. 4. Reports on active rent operations

The report «Rent from a specific date» («Оренда від заданої дати») (Fig. 5) shows all buildings in rent since April 1<sup>st</sup>.

Вид нерухомості	Назва споруди/№ зем ділянки	Площа м2	Дата початку оренди	Дата закінчення оренди	Організація	Сплачено	Кількість днів	Вартість загальна, грн
земельна ділянка	№1	20	16.05.2016	31.07.2016	ПрАТ ВТФ "МТН-ПОЛТАВА"	<input checked="" type="checkbox"/>	76	2 356,00
споруда	Кіоск №1	25	02.05.2016	26.06.2016	ПАТ Мішутка	<input checked="" type="checkbox"/>	55	2 612,50
споруда	Кіоск №2	35	29.05.2016	30.06.2016	ПрАТ "Комбінат виробничих	<input type="checkbox"/>	32	2 128,00
земельна ділянка	№5	65	09.05.2016	25.07.2016	ПП Федченко	<input checked="" type="checkbox"/>	77	7 757,75
							<b>Всього:</b>	14 854,25
							Сплачено:	12 726,25
							Заборовано:	2 128,00

Fig. 5. Report on buildings in rent since April 1<sup>st</sup>

The developed forms are not oversaturated with en-route data from all the calculations but instead contain all the end results necessary for the decision-making process. Similar forms are developed for all queries.

To protect the information from unwarranted access, a special safety measure table was developed called «Login window» («Вікно входу») (Fig. 6).

Fig. 6. DBMS user identification window

The form has a list of employees to choose from, as well as a password field that needs to be filled in order to log in. If one of the fields is left blank or is incorrect, the user will receive the relevant error window.

A calculation regarding the financial efficiency of the developed DB was conducted using the following analysis data: development costs, labor time of employees saved on data processing, net present value of spent costs, as well as a profit-investment ratio and rate of return. This data is shown in table 2.

Table 2

Main indicators of efficiency of the developed DB

Indicator	Value
DB development costs	3799,00 UAH
Labor time savings per year	19,25 working days
NPV	5128,43 UAH
Profit-investment ratio	2,62
Rate of return	0,95 of a year

DB development costs include payroll expenses, the cost of a 3 year long support, energy consumption expenses as well as amortization costs. The accountant labor time towards data processing savings from the DB implementation are 35 minutes daily or 0,88 of a labor month (19,25 days per year).

The calculated NPV value is based on 3 years of DB service. The NPV criterion displays the change in economic potential of an enterprise after implementing a certain project. Since the value is above 0, the conclusion can be made that this project (the developed DB) is profitable.

The profit-investment ratio was also determined and its value is 2,62. The value is higher than 1, thus the DB should be implemented. The rate of return calculation has shown that the enterprise will return spent costs after 0,95 of a year. The analyzed data shows, that the developed DB is a viable information system to store rent accounting data and to make retail real estate management decisions.

**Conclusions.** In this project, an automatic rent accounting database system was developed with an easy to use intuitive interface. It automates basic accounting processes, making the accountant's job easier and improving the speed of data processing. In the future, this DB will act as an aid in the shift towards electronic accounting. This will create conditions to improve management quality, increase competitiveness and improve the financial stability of the company.

Thus, implementing the developed DB will have an economic impact and will have a positive effect on the speed and rationality of management decision-making regarding planning rent income and costs. The developed DB can also be used by other companies that are lessees of retail real estate or manage similar markets and want to improve their workflow.

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UDK 004.415

**Yuri Kharchenko**, PhD (Technics), Assistant Professor. **Shapoval Maria**, student. Poltava National Technical Yurii Kondratiuk University. **Improving of the informational systems of retail real estate rent accounting and management.** The article deals with a researching of the retail real estate market in the world and in Ukraine. The authors analyzed the information system for rent accounting and management for one of the biggest trade complexes in Poltava. It was argued the need to improve the current accounting

system to support the company's decision making. An automated accounting system for retail real estate renting was developed for the analyzed company, although other companies can also use this system to improve their decision making process.

**Keywords:** retail real estate, trade complex, automated management system, real estate rent accounting.

УДК 004.415

**Юрій Анатолійович Харченко**, кандидат технічних наук, доцент. **Марія Володимирівна Шаповал**, студентка. Полтавський національний технічний університет імені Юрія Кондратюка. **Удосконалення інформаційної системи обліку та управління орендою торгового нерухомого майна.** Виконано дослідження ринку торгової нерухомості в Україні та світі. Зроблено висновок, що в нинішніх умовах нестабільної політичної й економічної ситуації актуальним завданням є впровадження суб'єктами господарської діяльності нового організаційно-економічного механізму шляхом автоматизації системи обліку надання в оренду нерухомого майна для підвищення ефективності його використання та поліпшення фінансової стійкості.

Для досягнення поставленої мети виконано аналіз торгового нерухомого майна м. Полтави. Виявлено, що лідерами за кількістю покупок і лояльністю покупців є ТРЦ «Екватор» та «Київ». Разом з тим відзначено суттєву частку ринкової торгівлі в місті. Після дослідження інформаційної системи обліку й управління орендою нерухомого майна одного з найбільших універсальних товарно-ринкових комплексів «Алмазний» обґрунтовано необхідність подальшого вдосконалення системи обліку для підтримки прийняття рішень у компанії, яка управляє ринком. Щоб досягти поставленої мети, розроблено структуру таблиць бази даних у системі управління базами даних (СУБД) Microsoft Access 2010. Побудовано інтерфейс користувача (головну форму). За допомогою гіперпосилань, що наявні у підлеглих формах, є можливість переходу до повних відомостей про оренду чи нерухоме майно. Розроблено одинадцять запитів і форм звітів із необхідними підсумковими даними, які будуть використані для обґрунтування управлінських рішень.

Упровадження БД дасть змогу отримати економічний ефект та позитивно вплине на обґрунтованість та оперативність прийняття управлінських рішень щодо прогнозування надходжень і планування витрат коштів від оренди. Розроблену автоматизовану систему обліку надання в оренду нерухомого майна також можуть використовувати інші компанії, що здійснюють облік оренди торгового нерухомого майна або управляють подібними ринками.

**Ключові слова:** торгова нерухомість, товарно-ринковий комплекс, автоматизована система управління, облік оренди нерухомого майна.

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Для решения поставленной задачи выполнен анализ торгового недвижимого имущества г. Полтавы. Вывявлено, что лидерами по количеству покупок и лояльности покупателей являются ТРЦ «Экватор» и «Киев». Вместе с тем отмечено существенные объемы рыночной торговли в городе. После исследования информационной системы учета и управления арендой недвижимого имущества одного из самых больших универсальных товарно-рыночных комплексов «Алмазний» обоснована необходимость дальнейшего совершенствования системы учета для поддержки принятия решений в компании, которая управляет ринком. Чтобы достичь поставленной цели, разработана структура таблиц базы данных в системе управления базами данных (СУБД) Microsoft Access 2010. Создан интерфейс пользователя (главная форма). С помощью гиперссылок, которые имеются в подчиненных формах, есть возможность перехода к полным данным об аренде или недвижимом имуществе. Разработано одиннадцать запросов и форм отчетов с необходимыми итоговыми данными, которые будут использоваться для обоснования управленческих решений.

Внедрение БД даст возможность получить экономический эффект и позитивно повлияет на обоснованность и оперативность принятия управленческих решений по прогнозированию поступлений и планированию расходов средств от аренды. Разработанную автоматизированную систему учета сдачи в аренду недвижимого имущества также могут использовать другие компании, которые осуществляют учет аренды торгового недвижимого имущества или управляют подобными рынками.

**Ключевые слова:** торговая недвижимость, товарно-рыночный комплекс, автоматизированная система управления, учет аренды недвижимого имущества.