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AND COMMUNICATION TECHNOLOGIES
IN SMALL BUSINESS DEVELOPMENT***Олена Волот, Вадим Колоток***МІЖНАРОДНИЙ ДОСВІД ВИКОРИСТАННЯ
ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНИХ ТЕХНОЛОГІЙ
У РОЗВИТКУ МАЛОГО БІЗНЕСУ***Елена Волот, Вадим Колоток***МЕЖДУНАРОДНЫЙ ОПЫТ ИСПОЛЬЗОВАНИЯ
ИНФОРМАЦИОННО-КОММУНИКАЦИОННЫХ ТЕХНОЛОГИЙ
В РАЗВИТИИ МАЛОГО БИЗНЕСА**

The following article examines the international experience of introduction of information technologies in Israel, describes characteristics and analyzes the main features of the use of modern information and communication technologies of accounting and management at small business enterprises in Israel and Ukraine. The problems associated with the features of small businesses in the use of ICT have been identified, a step-by-step approach to solving the problems of introduction of information technologies into the management of a modern small business enterprise has been presented.

Keywords: modern information and communication technologies; small business enterprises; automated informational systems; management informational systems.

Fig.: 2. Table: 2. References: 19.

У статті досліджено міжнародний досвід впровадження інформаційних технологій Ізраїлю, розглянуто характеристики та проаналізовано особливості використання сучасних інформаційно-комунікаційних технологій бухгалтерського обліку та управління на підприємствах малого бізнесу Ізраїлю та України. Визначено проблеми, пов'язані з особливостями малих підприємств при використанні ІКТ, наведено покроковий підхід до вирішення проблем запровадження інформаційних технологій в управлінні сучасним підприємством малого бізнесу.

Ключові слова: сучасні інформаційно-комунікаційні технології; підприємства малого бізнесу; автоматизовані інформаційні системи; інформаційні системи управління.

Рис.: 2. Табл.: 2. Бібл.: 19.

В статье исследованы международный опыт внедрения информационных технологий Израиля, рассмотрены характеристики и проанализированы особенности использования современных информационно-коммуникационных технологий бухгалтерского учета и управления на предприятиях малого бизнеса Израиля и Украины. Определены проблемы, связанные с особенностями малых предприятий при использовании ИКТ, приведены пошаговый подход к решению проблем внедрения информационных технологий в управлении современным предприятием малого бизнеса.

Ключевые слова: современные информационно-коммуникационные технологии; предприятия малого бизнеса; автоматизированные информационные системы; информационные системы управления.

Рис.: 2. Табл.: 2. Библ.: 19.

JEL Classification: M40

Target setting. Digitization is becoming an integral part of any modern enterprise. It has become a modern trend due to complete development of the most recent information technology (IT). In the developed countries small business enterprises are already confidently using various information and communication technology (ICT) for their activities. Therefore, it is important to cover this issue in order to study and implement the experience of leading countries in the use of IT in small business.

Ukraine seeks a comprehensive growth of its own economy, improvement of social welfare and increase of export potential. This scenario is possible directly through the introduction of international practices in the use of information and communication technology in all spheres of livelihoods of the state. First of all, it is necessary to introduce ICT at small business enterprises, since this is an assurance of their development as well as economic improvement of developed countries as shown by international experience. Israel is one of such countries. It is therefore advisable to study this country's experience in the implementation of ICT in small business.

Actual scientific researches and issues analysis. The research of small business problems in Ukraine has been reflected in the works by M. Butko, Z. Varnalii, N. Galan, Z. Gerasymchuk, T. Gogol, S. Dryha, V. Kischak, N. Krasnokutska, M. Malik, L. Cherniuk, M. Chumachenko and others. The problems of information systems of economic character have been investigated in the works by numerous scientists, in particular S. Golov, S. Ivakhnenkov, A. Kuzminskyi, P. Kutsyk, V. Larikov, E. Mnykh, B. Odintsov, V. Palii, V. Pleskach S. Ramazanov, Ya. Sokolov, S. Shkarlet and others.

Uninvestigated parts of general matters defining. However, in spite of the wide range of research on the possibilities of technology implementation in business activities, insufficient attention is paid to the problems associated with specific steps towards implementing modern ICT in the practice of small business management, that is, the efficiency of information technology implementation in the entrepreneurial environment of small business remains insufficient.

The research objective. The main goal of this article considers theoretical and practical aspects of studying the international practice of implementing ICT at small business enterprises, substantiating the feasibility of their application in small business of Ukraine in order to improve the efficiency of enterprise management.

The statement of basic materials. The presence of a system that automates collection, preparation and processing of information is one of the necessary conditions determining the ultimate success of the enterprise activities [1].

The management system of even a small manufacturing enterprise involves the circulation of a large amount of diverse accounting, regulatory and technological information. This information is not only necessary for direct control of production processes, but it is also an important basis for conducting various kinds of analysis (for example, effectiveness of using equipment, calculation of key performance indicators, etc.) [1].

Collection, processing and storage of such information in small business is accomplished through information as well information and communication technologies.

Information technology (IT) is a human-computer technology that collects, processes, stores and transmits information to the user. According to the academician V. M. Glushkov the information technology refers to all kinds of technologies applied for creation, storage, exchange and use of information in all possible forms [2].

Information technology based on the use of personal computers, computer networks and communication tools form the information and communication technology. The term information and communication technology is sometimes used as a synonym for information technology, although ICT is a more general term, emphasizing the role of unified technologies and the integration of telecommunications (telephone lines, wireless connections), computers, software, storage and audiovisual systems that allow users to create, save, modify, share, and transfer data to other users.

Numerous experts interpret the concept of “information and communication technology” in different ways. Thus, it is necessary to consider these different approaches. The results of the review are shown in table 1.

Thus, as we can see from the table, all authors give a similar interpretation of the concept «information and communication technology». They understand this notion either as a «set of methods and techniques» or as «technologies» through which various data sets are collected, processed and transmitted. That is, the concept of ICT is not quite clear. It is a collection of various technological tools and resources used to support the process of communication and creation, distribution, storage and management of information.

Table 1

Interpretation of the «information and communication technologies» concept

Author	Determination
O. Zhuk	A set of methods, tools and techniques used for selection, processing, storage, submission, transfer of various data and materials needed to improve the efficiency of various activities
A. Zapadynchuk	Technologies associated with creation, storage, transmission, processing and management of information.
L. Matviychuk	A set of methods, tools and techniques for searching, storing, processing, submitting and transmitting graphic, text, digital, audio and video data based on personal computers, computer networks and communication tools.
N. Morze	Information technology based on personal computers, computer networks and communication tools, characterized by the presence of a friendly user experience.
M. Zhaldak	A set of methods, tools and techniques used to collect, organize, store, process, transmit, submit various messages and data.

Source: worked out by the authors on the basis of [3-7].

Modern ICT used by small business enterprises are expected to meet three principles: integrity, flexibility and interactivity.

According to the State Statistics Service in 2016 95.2 % of enterprises were using computers in their work (as in 2015), while 93.5 % had access to the Internet (in 2015 – 93.2 %) [8].

That is, as can be seen, there is a tendency to increase the use of information and communication technology by enterprises.

The use of information technology has several advantages. The main advantages of using information technology in the enterprise management are as following:

- raising the manageability level;
- decreasing the impact of human factors;
- reduction of paper work;
- improving the efficiency and reliability of information;
- reduction of costs;
- accounting and control optimization;
- ensuring transparency of information for investors;
- an opportunity of increasing the market share [9].

Small business enterprises often use ICT to be able to survive alongside the big ones. They can coordinate their actions such as order fulfillment or inventory tracking while keeping a small number of staff [10]. However, that is not enough. ICT should be applied to all processes in the enterprise. This will better respond to changes in the internal and external environment of small business. It is therefore appropriate to use the experience of other countries, such as Israel.

Small business in Israel is the most developed sector. In particular, 50.4% of business conduct its activities without employed workers; 35.2 % of entrepreneurs hire 1 up to 4 workers; 10.9 % – from 5 to 19 workers; 3 % – from 20 to 100 workers; 0.5 % – more than 100 workers [11].

According to the Global Innovation Index [12], Israel ranks 11th in the 2018 Global Innovation Index. Instead, Ukraine ranks 43rd in this rating.

To initiate the development of innovative environment, Israel pursues a policy of aggressive investment in the ICT sector. In 2015, the country had 96 merger and acquisition agreements totaling \$ 8.4 billion. Between 2006 and 2015, the country saw more than 1,000 exits from high-tech companies that account for more than \$ 60 billion in the capital flows. Israel is one of the world's largest investors in start-ups per capita, which also creates a very favorable environment for business development and venture investment in the country (fig. 1) [13].

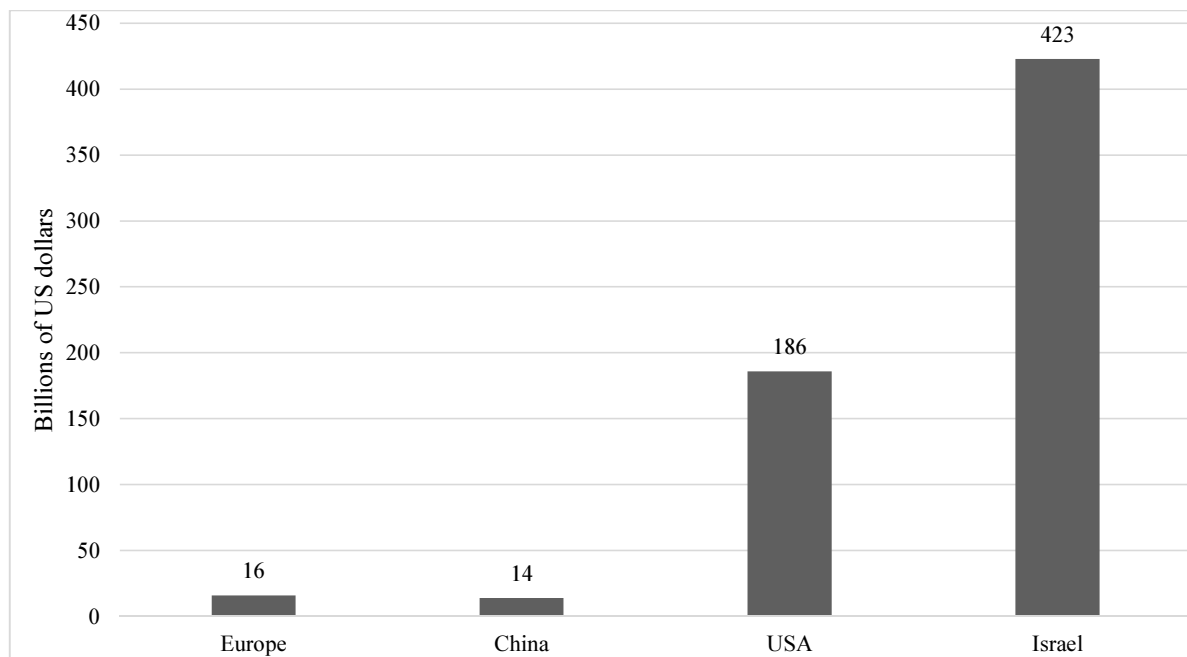


Fig. 1. Investments in start-ups in 2015 per capita

Source: worked out by the authors on the basis of [14].

The main Internet tools used in the managerial ICT are a Website, a workflow system, a customer service system, some planning tools and performance analysis. Currently, the most popular custom website creation services are Shopify and Wordpress. Using their templates, it is possible to create a fully featured website for presenting your business online in a short time, without the involvement of web developers [11].

One of the most popular document management tools is Google Docs, which contains a complete set of office tools: documents, corporate calendar, questions and forms, chat and voice mail, video conferencing. Slack tools can be used to work directly with clients [11].

The main planning approaches in Israel are Scrum microcycles, as well as Kanban planning through stickers. Microsoft Project, Trello, JIRA and Excel software are also applied for planning. To analyze the competitors and efficiency of their performance, Google Analytics online service is applied, which is free, easy to configure and provides a complete analysis of the website [11].

It is obvious that small business enterprises in Israel use various Internet services in their activities.

In Ukraine there is also a number of Internet technologies applied, in particular:

- Google Drive is a “cloud storage” where one can store files. This free storage is available for up to 15 gigabytes. Owners of this storage can also create and edit files using such services as Google Docs, Google Sheets, Google Slides and more. The listed services are also provided free of charge.

- eDisk is another “cloud storage” located at edisk.ukr.net. Unlike Google Drive, eDisk can only save files up to 4 gigabytes and has no services for creating and editing files.

- Prom.ua is a service that allows to create a website for the company and apply it for selling products and services. One can use both free and premium tariffs, thus obtaining even greater opportunities.

- Various e-mail services, such as ukr.net, i.ua, meta.ua and others.

Various information systems and technologies are used for accounting and management purposes at small enterprises in Ukraine (table 2).

Table 2

Information systems and technologies used at small enterprises in Ukraine

Goals of ICT use	Information systems and technologies
For accounting purposes	<ul style="list-style-type: none"> - specialized accounting programs (1C, Sail, Info-Accountant, etc.); - electronic document management systems (M.E.Doc, OPZ, Artzvit, Sonata, etc.); - applications for remote banking services; - information and legal systems (Liha: zakon, Dinay, Infodisk etc.)
For management purposes	<ul style="list-style-type: none"> - information technologies of volume scheduling; - material requirement planning (MRP I); - capacity requirement planning (CRP); - closed loop of material resource planning (CL MRP); - manufacture resource planning (MRP II); - world-class manufacture (WCM); - enterprise resource planning (ERP); - optimization of resource planning (ERP II)

Source: compiled by authors based on [15; 16].

Still, there are some problems associated with the features of small enterprises when using ICT in small business:

- insignificant financial opportunities due to the implementation of information and communication technology;
- the need for staff training in technology application;
- lack of leadership's understanding upon the necessity and expediency of using information technologies in small business;
- errors during installation, selection of materials, possible equipment failures, order mismatch [17];
- increasing threats to information resources and flows at the enterprise.

In order to solve problems of introducing information technologies in the management of modern enterprises, S.O. Kraichuk recommends to follow a clearly established sequence of steps (Fig. 2).

Nevertheless, we believe that these steps are insufficient. In order to solve the challenges associated with implementing ICT in small business, it is necessary to provide the following issues: improving the skills of employees; using credit costs for the introduction of information and communication technology and means for the protection of information flows and resources; attracting specialists to install software and hardware; investigation and implementation of the experience of developed countries in ICT application.

The most promising area for the introduction of new information technologies in modern conditions is creation and use of new generation information systems in the managerial sector, which are oriented on the distributed data processing, creation of computer networks, expert systems, decision support systems, automated workplaces of management personnel.

The most affordable software products for small business enterprises today are:

- 1) Project Management Systems/Software;
- 2) customer relations management systems (sales sanagement) – Customer Relations Management;
- 3) systems of collective work on information (wiki projects, discussion platforms, forums);
- 4) small systems of workflow and enterprise management automation (ERP, ECM – Enterprise Content Management, BPM - Business Processes Management);
- 5) special ordering systems [19].

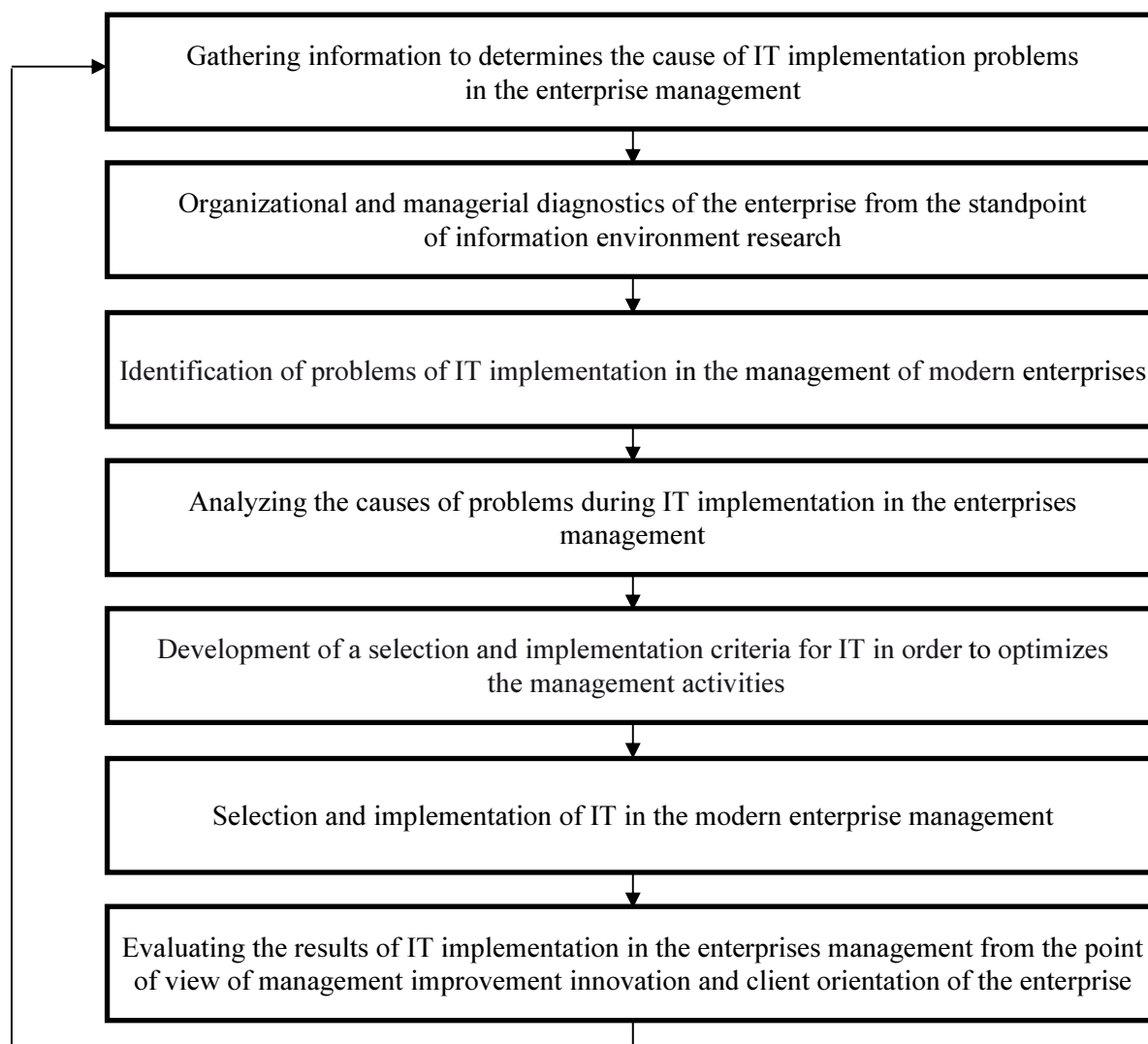


Fig. 2. A step-by-step approach to solving the problems of IT implementation in modern enterprise management

Source: compiled by authors based on [18].

It is necessary for each enterprise, when choosing an information system, to take into account the specifics of its activity, as well as to determine particular goals and tasks, the solution of which must be carried out by means of information and communication technology. Only in such a way the rational planning for the effective use of information technology in small business can be possible.

Conclusions. For Ukraine, as a developing country, the introduction of automated information and communication systems, which contribute to improving the efficiency of functioning of all enterprises and small business in particular, can significantly reduce the complexity of accounting, create new opportunities in the management organization and methodology. In order to improve the management of small business, it is advisable to use the practice of Israel in ICT implementation, especially in the area of Internet technology. These steps will allow small enterprises to conduct the most effective business activities.

Thus, the performance of a modern enterprise is impossible without reliable and efficient information support of its activities. The competitiveness of modern business depends directly on the speed of receipt, as well as quality of processing and analysis of information, on the basis of which the managerial decisions are made. In other words, even small enterprises cannot effectively carry out their business activities without the use of modern information technology [19].

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ГАЛУЗЕВИЙ АСПЕКТ РОЗВИТКУ НАЦІОНАЛЬНОГО ГОСПОДАРСТВА

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