

UDK 37

ISSN 2545 - 4439  
ISSN 1857 - 923X

# INTERNATIONAL JOURNAL

Institute of Knowledge Management

# KNOWLEDGE



**Scientific Papers**

**NATURAL SCIENCES**

**Vol. 30. 3.**

# Editorial Team

## Editor-in-Chief

Prof. PhD Robert Dimitrovski, Institute of management and knowledge, Skopje, (N. Macedonia)

## Editorial Advisory Board

Academic, Prof. Vlado Kambovski PhD, Skopje (N. Macedonia)

Prof. Sinisa Zaric, PhD, Faculty of Economics, University of Belgrade, Belgrade (Serbia)

Prof. Maria Kavdanska PhD, Faculty of Pedagogy, South-West University Neofit Rilski, Blagoevgrad (Bulgaria)

Prof. Venelin Terziev PhD, University of Rousse, Rousse (Bulgaria)

Prof. Cezar Birzea, PhD, National School for Political and Administrative Studies, Bucharest (Romania)

Prof. Veselin Videv PhD, Faculty of Economics, Trakia University, (Bulgaria)

Prof. Ivo Zupanovic, PhD, Faculty of Business and Tourism, Budva (Montenegro)

Prof. Savo Ashtalkoski, PhD, Faculty of Economics, FON University, Skopje (N. Macedonia)

Prof. Mersad Mujevic PhD, Public Procurement Administration of Montenegro (Montenegro)

Prof. Milka Zdravkovska, PhD, Faculty of Medical Sciences "Goce Delcev" University – Shtip, (N. Macedonia)

Prof. Drago Cvijanovic, PhD, Faculty of Hotel Management and Tourism, University of Kragujevac, Vrnjacka Banja (Serbia)

Prof. Lazar Stosic, PhD, Association for Development of Science, Engineering and Education, Vranje (Serbia)

Prof. Krasimira Staneva PhD, University of Forestry, Sofia (Bulgaria)

Prof. Daniela Todorova PhD, "Todor Kableshev" University of Transport, Sofia (Bulgaria)

Prof. Baki Koleci PhD, University Hadzi Zeka, Peya (Kosovo)

Prof. Lisen Bashkurti PhD, Global Vice President of Sun Moon University (Albania)

Prof. Sinisa Opic, PhD, Faculty of Humanities and Social Sciences, University of Zagreb, (Croatia)

Prof. Marija Kostic PhD, Faculty of Hotel Management and Tourism, University of Kragujevac, Vrnjacka Banja (Serbia)

### **International Editorial Board members**

**President:** Academic, Prof. Vlado Kambovski PhD, Skopje (N. Macedonia)

#### **Vice presidents:**

Prof. Robert Dimitrovski PhD, Institute of Knowledge Management, Skopje (N. Macedonia)

Prof. Sinisa Zaric, PhD, Faculty of Economics, University of Belgrade, Belgrade (Serbia)

Prof. Venelin Terziev PhD, University of Rousse, Rousse (Bulgaria)

Prof. Mersad Mujevic PhD, Public Procurement Administration of Montenegro (Montenegro)

Prof. Tihomir Domazet PhD, President of the Croatian Institute for Finance and Accounting, Zagreb (Croatia)

#### **Members:**

- Aleksandar Korablev PhD, Faculty of economy and management, Saint Petersburg State Forest Technical University, Saint Petersburg (Russian Federation)
- Azra Adjajlic – Dedovic PhD, Faculty of criminology and security, Sarajevo (Bosnia & Herzegovina)
- Anita Trajkovska PhD, Rochester University (USA) Prof. Anka Trajkovska-Petkoska PhD, UKLO, Faculty of technology and technical sciences, Bitola (N. Macedonia)
- Alisabri Sabani PhD, Faculty of criminology and security, Sarajevo (Bosnia & Herzegovina)
- Aneta Mijoska PhD, Faculty of Dentistry, University “St. Cyril and Methodius”, Skopje (N. Macedonia)
- Ahmad Zakeri PhD, University of Wolverhampton, (United Kingdom)
- Ana Dzumalieva PhD, South-West University “Neofit Rilski”, Blagoevgrad (Bulgaria)
- Aziz Pollozhani PhD, Rector, University Mother Teresa, Skopje (N.Macedonia)
- Artan Nimani PhD, Rector, University of Gjakova “Fehmi Agani” (Kosovo)
- Branko Sotirov PhD, University of Rousse, Rousse (Bulgaria)
- Branko Boshkovic, PhD, College of Sports and Health, Belgrade (Serbia)
- Branimir Kampl PhD, Institute SANO, Zagreb (Croatia)
- Baki Koleci PhD, University Hadzi Zeka, Peja (Kosovo)
- Branislav Simonovic PhD, Faculty of Law, Kragujevac (Serbia)
- Bistra Angelovska, Faculty of Medicine, University “Goce Delcev”, Shtip (N.Macedonia)

- Cezar Birzea, PhD, National School for Political and Administrative Studies, Bucharest (Romania)
- Cvetko Andreevski, Faculty of Tourism, UKLO, Bitola (N.Macedonia)
- Drago Cvijanovic, PhD, Faculty of Hotel Management and Tourism, University of Kragujevac, Vrnjacka Banja (Serbia)
- Dusan Ristic, PhD Emeritus, College of professional studies in Management and Business Communication, Novi Sad (Serbia)
- Darijo Jerkovic PhD, Faculty of Business Economy, University "Vitez", (Bosnia & Herzegovina)
- Daniela Todorova PhD, "Todor Kableshev" University of Transport, Sofia (Bulgaria)
- Dragan Kokovic PhD, University of Novi Sad, Novi Sad (Serbia)
- Dragan Marinkovic PhD, High health – sanitary school for professional studies, Belgrade (Serbia)
- Daniela Ivanova Popova PhD, Faculty of Public Health and Sport, SWU Neofit Rilski, Blagoevgrad (Bulgaria)
- Dzulijana Tomovska, PhD, Faculty of Biotechnical sciences, Bitola (N.Macedonia)
- Evgenia Penkova-Pantaleeva PhD, UNWE -Sofia (Bulgaria)
- Fadil Millaku, PhD, Rector, University "Hadzi Zeka", Peja (Kosovo)
- Fatos Ukaj, University "Hasan Prishtina", Prishtina (Kosovo)
- Georgi Georgiev PhD, National Military University "Vasil Levski", Veliko Trnovo (Bulgaria)
- Halit Shabani, PhD, University "Hadzi Zeka", Peja (Kosovo)
- Halima Sofradzija, PhD, University of Sarajevo, Sarajevo (Bosnia and Herzegovina)
- Haris Halilovic, Faculty of criminology and security, University of Sarajevo, Sarajevo (Bosnia and Herzegovina)
- Helmut Shramke PhD, former Head of the University of Vienna Reform Group (Austria)
- Hristina Georgieva Yancheva, PhD, Rector, Agricultural University, Plovdiv (Bulgaria)
- Hristo Beloev PhD, Bulgarian Academy of Science, Rector of the University of Rousse (Bulgaria)
- Hristina Milcheva, Medical college, Trakia University, Stara Zagora (Bulgaria)
- Izet Zeqiri, PhD, Academic, SEEU, Tetovo (N.Macedonia)
- Ivan Marchevski, PhD, D.A. Tsenov Academy of Economics, Svishtov (Bulgaria)
- Ibrahim Obhodjas PhD, Faculty of Business Economy, University "Vitez", (Bosnia & Herzegovina)
- Igor Stubelj, PhD, PhD, Faculty of Management, Primorska University, Koper (Slovenia)
- Ivo Zupanovic, PhD, Faculty of Business and Tourism, Budva (Montenegro)
- Ivan Petkov PhD, European Polytechnic University, Pernik (Bulgaria)
- Isa Spahiu PhD, AAB University, Prishtina (Kosovo)
- Ivana Jelik PhD, University of Podgorica, Faculty of Law, Podgorica (Montenegro)
- Islam Hasani PhD, Kingston University (Bahrein)
- Jamila Jaganjac PhD, Faculty of Business Economy, University "Vitez", (Bosnia & Herzegovina)
- Jova Ateljevic PhD, Faculty of Economy, University of Banja Luka, (Bosnia & Herzegovina)
- Jove Kekenovski PhD, Faculty of Tourism, UKLO , Bitola (N.Macedonia)
- Jonko Kunchev PhD, University „Cernorizec Hrabar“ - Varna (Bulgaria)

- Prof Karl Schopf, PhD, Akademie fur wissenschaftliche forchung und studium, Wien (Austria)
- Katerina Belichovska, PhD, Faculty of Agricultural Sciences, UKIM, Skopje (N. Macedonia)
- Krasimir Petkov, PhD, National Sports Academy "Vassil Levski", Sofia (Bulgaria)
- Kamal Al-Nakib PhD, College of Business Administration Department, Kingdom University (Bahrain)
- Kiril Lisichkov, Faculty of Technology and Metallurgy, UKIM, Skopje (N.Macedonia)
- Krasimira Staneva PhD, University of Forestry, Sofia (Bulgaria)
- Lidija Tozi PhD, Faculty of Pharmacy, Ss. Cyril and Methodius University, Skopje (N.Macedonia)
- Lasto Spasovski PhD, Vocational and educational centre, Skopje (N.Macedonia)
- Larisa Velic, PhD, Faculty of Law, University of Zenica, Zenica (Bosnia and Herzegovina)
- Łukasz Tomczyk PhD, Pedagogical University of Cracow (Poland)
- Lujza Grueva, PhD, Faculty of Medical Sciences, UKIM, Skopje (N.Macedonia)
- Lazar Stosic, PhD, Association for development of science, engineering and education, Vranje (Serbia)
- Lulzim Zeneli PhD, University of Gjakova "Fehmi Agani" (Kosovo)
- Lisen Bashkurti PhD, Global Vice President of Sun Moon University (Albania)
- Lence Mircevska PhD, High Medicine School, Bitola, (N.Macedonia)
- Ljupce Kocovski PhD, Faculty of Biotechnical sciences, Bitola (N.Macedonia)
- Marusya Lyubcheva PhD, University "Prof. Asen Zlatarov", Member of the European Parliament, Burgas (Bulgaria)
- Marija Magdinceva – Shopova PhD, Faculty of tourism and business logistics, University "Goce Delchev", Shtip (N. Macedonia)
- Maria Kavdanska PhD, Faculty of Pedagogy, South-West University Neofit Rilski, Blagoevgrad (Bulgaria)
- Maja Lubenova Cholakova PhD, Faculty of Public Health and Sport, SWU Neofit Rilski, Blagoevgrad (Bulgaria)
- Mirjana Borota-Popovska, PhD, Centre for Management and Human Resource Development, Institute for Sociological, Political and Juridical Research, Skopje (N.Macedonia)
- Mihail Garevski, PhD, Institute of Earthquake Engineering and Engineering Seismology, Skopje (N.Macedonia)
- Misho Hristovski PhD, Faculty of Veterinary Medicine, Ss. Cyril and Methodius University, Skopje (N.Macedonia)
- Mitko Kotovchevski, PhD, Faculty of Philosophy, UKIM, Skopje (N.Macedonia)
- Milan Radosavljevic PhD, Dean, Faculty of strategic and operational management, Union University, Belgrade (Serbia)
- Marija Topuzovska-Latkovic, PhD, Centre for Management and Human Resource Development, Institute for Sociological, Political and Juridical Research, Skopje (N.Macedonia)
- Marija Knezevic PhD, Academic, Banja Luka, (Bosnia and Herzegovina)
- Margarita Bogdanova PhD, D.A.Tsenov Academy of Economics, Svishtov (Bulgaria)

- Mahmut Chelik PhD, Faculty of Philology, University “Goce Delchev”, Shtip (N.Macedonia)
- Marija Mandaric PhD, Faculty of Hotel Management and Tourism, University of Kragujevac, Vrnjacka Banja (Serbia)
- Marina Simin PhD, College of professional studies in Management and Business Communication, Sremski Karlovci (Serbia)
- Miladin Kalinic, College of professional studies in Management and Business Communication, Sremski Karlovci (Serbia)
- Marijan Tanushevski PhD, Macedonian Scientific Society, Bitola (N. Macedonia)
- Mitre Stojanovski PhD, Faculty of Biotechnical sciences, Bitola (N.Macedonia)
- Miodrag Smelcerovic PhD, High Technological and Artistic Vocational School, Leskovac (Serbia)
- Nadka Kostadinova, Faculty of Economics, Trakia University, Stara Zagora (Bulgaria)
- Natalija Kirejenko PhD, Faculty For economic and Business, Institute of Entrepreneurial Activity, Minsk (Belarus)
- Nenad Taneski PhD, Military Academy “Mihailo Apostolski”, Skopje (N.Macedonia)
- Nevenka Tatkovic PhD, Juraj Dobrila University of Pula, Pula (Croatia)
- Nedžad Korajlic PhD, Dean, Faculty of criminal justice and security, University of Sarajevo (Bosnia and Herzegovina)
- Nonka Mateva PhD, Medical University, Plovdiv (Bulgaria)
- Nikolay Georgiev PhD, “Todor Kableshev” University of Transport, Sofia (Bulgaria)
- Nishad M. Navaz PhD, Kingdom University (India)
- Nano Ruzhin PhD, Faculty of Law, FON University, Skopje (N.Macedonia)
- Oliver Dimitrijevic PhD, High medicine school for professional studies “Hipokrat”, Bujanovac (Serbia)
- Paul Sergius Koku, PhD, Florida State University, Florida (USA)
- Primož Dolenc, PhD, Faculty of Management, Primorska University, Koper (Slovenia)
- Predrag Trajkovic PhD, JMPNT, Vranje (Serbia)
- Petar Kolev PhD, “Todor Kableshev” University of Transport, Sofia (Bulgaria)
- Pere Tumbas PhD, Faculty of Economics, University of Novi Sad, Subotica (Serbia)
- Rade Ratkovic PhD, Faculty of Business and Tourism, Budva (Montenegro)
- Rositsa Chobanova PhD, University of Telecommunications and Posts, Sofia (Bulgaria)
- Rossana Piccolo PhD, Università degli studi della Campania - Luigi Vanvitelli (Italy)
- Rumen Valcovski PhD, Imunolab Sofia (Bulgaria)
- Rumen Stefanov PhD, Faculty of public health, Medical University of Plovdiv (Bulgaria)
- Rumen Tomov PhD, Rector, University of Forestry, Sofia (Bulgaria)
- Sasho Korunoski PhD, UKLO, Bitola (N.Macedonia)
- Snezhana Lazarevic, PhD, College of Sports and Health, Belgrade (Serbia)
- Stojan Ivanov Ivanov PhD, Faculty of Public Health and Sport, SWU Neofit Rilski, Blagoevgrad (Bulgaria)
- Stojna Ristevska PhD, High Medicine School, Bitola, (N. Macedonia)
- Suzana Pavlovic PhD, High health – sanitary school for professional studies, Belgrade (Serbia)
- Sandra Zivanovic, PhD, Faculty of Hotel Management and Tourism, University of Kragujevac, Vrnjacka Banja (Serbia)

- Shyqeri Kabashi, College "Biznesi", Prishtina (Kosovo)
- Temelko Risteski PhD, Faculty of Law, FON University, Skopje (N. Macedonia)
- Todor Krystevich, D.A. Tsenov Academy of Economics, Svishtov (Bulgaria)
- Todorka Atanasova, Faculty of Economics, Trakia University, Stara Zagora (Bulgaria)
- Tatyana Sobolieva PhD, State Higher Education Establishment Vadiym Getman Kiyev National Economic University, Kiyev (Ukraine)
- Tzako Pantaleev PhD, NBUniversity , Sofia (Bulgaria)
- Violeta Dimova PhD, Faculty of Philology, University "Goce Delchev", Shtip (N. Macedonia)
- Vojislav Babic PhD, Institute of Sociology, University of Belgrade (Serbia)
- Volodymyr Denysyuk, PhD, Dobrov Center for Scientific and Technological Potential and History studies at the National Academy of Sciences of Ukraine (Ukraine)
- Valentina Staneva PhD, "Todor Kableshev" University of Transport, Sofia (Bulgaria)
- Venus Del Rosario PhD, Arab Open University (Philippines)
- Vjollca Dibra PhD, University of Gjakova "Fehmi Agani" (Kosovo)
- Yuri Doroshenko PhD, Dean, Faculty of Economics and Management, Belgorod (Russian Federation)
- Zlatko Pejkovski, PhD, Faculty of Agricultural Sciences, UKIM, Skopje (N.Macedonia)
- Zivota Radosavljevik PhD, Faculty FORCUP, Union University, Belgrade (Serbia)
- Zorka Jugovic PhD, High health – sanitary school for professional studies, Belgrade (Serbia)

---

## ADVANCED WAREHOUSE TECHNOLOGIES – PERSPECTIVES AND POSSIBILITIES

---

**Biljana Nedeva**

Faculty of Natural and Technical Sciences, „GoceDelcev” University, Stip, R. Macedonia,

[nedevabiljana@yahoo.com](mailto:nedevabiljana@yahoo.com)

**Dejan Krstev**

Mechanical Faculty, Sts Cyril and Methodij University, Skopje, R. Macedonia

**Abstract:** The selection of orders means to find a number of products in the warehouse matching a number of independent orders of several customers. It is an important part of the supply and distribution chain, accounting for 65% of the total operating costs of a typical warehouse. The emphasis of this work is on the synchronization of all activities within the manufacturing system, which is a permanent challenge for both a successful manufacture and business in general. For the realization of this research task it is necessary to start with the structure of the manufacturing system and to emphasize the hierarchy of objectives and also the strategies which should be employed for their realizations. The validity of the concept suggested is estimated out by computer simulation, using the initial data from the industry. The SAP or Perftech.Largo ERP is a simple and technically updated software for creating effective comprehensive business information systems that can at any time provide users with the desired status information in the company. The most commonly used modules are: finance, human resources management, sales and procurement, external operations, production, material operations. The simulation program starts with a temporary presumption that the materials needed for reproduction are available in the input data of the warehouse. All work orders are processed and sent to the data entry of the warehouse. The program starts the data at the time of occurrence of any work order within the system at the time required for its realization and automatically takes into account the priorities of each working order. The user has an intermediate material warehouse that enables normal operation of the production process and optimal supply time.

**Keywords:** Warehouse, advanced technologies, simulation Program

### INTRODUCTION

The next generation, technology-enhanced warehouses is bringing unprecedented levels of real-time visibility into organizations' assets, people and transactions across a myriad of industries, from discrete manufacturers in automotive, electronics and machinery to food and beverage processing companies. But it's the transformation of the supply chain ecosystem that has prompted operations professionals to take a hard look at upgrading their warehouses with an eye towards boosting productivity, slashing transportation costs and expediting merchandise shipments. As a result, supply chain networks are poised to undergo an extreme makeover over the next few years. Indeed, the retail, wholesale, transportation and logistics sectors are transitioning to "best-of-breed" warehouse management systems that take automatization to new heights — from equipping workers with mobile devices that increase the speed and accuracy of order picking to the rollout of radio frequency identification technology (RFID) for real-time inventory visibility. At the same time, executives plan to roll out more warehouses, while expanding their size and retrofitting them from legacy systems into highly mechanized, leaner facilities. This approach is designed to reduce costs and increase responsiveness to customers.

### 1. RESEARCH METHODOLOGY

Warehouse industry is also banking on the IoT to streamline and link up the many moving parts of a supply chain by allowing for real-time, sharable and actionable data insights across a variety of processes, from inventory tracking and order picking to maximizing fleet routes.

As warehouse executives prepare to increase the volume of items shipped in the coming years, they rank outfitting staff with new technology, as well as increasing the use of barcode scanning, tablets and the Internet of Things, as their top initiatives and lead investments for an optimized supply chain.

Succeeding in the new supply chain paradigm calls for shortening merchandise delivery times and slashing transportation costs, which were cited by executives surveyed as the core reasons driving the move to the smart warehouse.

Big investments in automating inventory management, the heart of a warehouse operation, are another strategic imperative.



---

The RFID technology is another big push. The Internet of Things, objects enhanced with electronics, sensors and network connectivity that enable them to collect and exchange data, has sparked a big buzz around “smart” consumer products, such as fitness wearables that track a user’s activity level. When it comes to the application of IoT technology, RFID, once cost prohibitive and now significantly more affordable, will play a critical role in modernizing warehouses for the era of digital commerce. RFID offers the promise of heightened inventory visibility — the ability to know precisely where any pallet, case or SKU is in the warehouse at any given moment. For this reason, retailers, manufacturers, distribution and logistics providers are planning to more than double their usage of RFID for cycle counts and inventory validation by 2020. An RFID-enabled warehouse-management system can boost efficiencies in put-away and picking, verify shipments received from the manufacturer and those shipped to stores with greater precision, increase everything from inventory accuracy to merchandise replenishment speed — while reducing opportunities for human error. Optimizing warehouse logistics so that the right goods reach the right customers at the right time has never been more crucial amid the explosion of direct-to-consumer sales. A changing ecosystem means retailers, wholesalers and transportation companies are not only delivering items to stores, but shipping them to consumers’ homes. In addition, they are servicing more customer who buy online, pick-up in-store and meeting the growing demand for same-day deliveries

## **2. USHERING IN AN ERA OF WORKER PRODUCTIVITY**

Warehouse executives are also turning to technology enhancements to ratchet up worker productivity when it comes to order picking and fulfillment, which eats up 70 percent of a facility’s operating costs. The move to multi-modal picking, which augments voice picking with screen-directed picking on mobile devices, be they handheld and vehicle-mounted or wearables, is designed to automate and quicken the workflow to accommodate order volume surges in the supply chain, reduce pick and fill costs and enhance profit margins. At the same time, companies will turn to task interleaving to boost worker efficiency. The productivity practice maximizes employees’ movements based on their location and equipment usage in the space by assigning them multiple tasks, such as order picking or truck loading. Studies show that task interleaving can boost worker productivity from 10 percent up to 40 percent. Over the next five years, warehouse executives will expand the use of cross-docking, which minimizes material handling by eliminating unnecessary put away. Their goal is to increase inventory throughput and decrease delivery times without the need for additional storage capacity — efficiencies that have gained new importance as order volumes increase and per order values decrease.

## **3. GOING GREEN**

Over the next few years, warehouses will become increasingly eco-friendly. As “conscious capitalism” has moved from the margins to the mainstream in business practices, the warehouse industry is no exception. Key eco-conscious initiatives include reducing and recycling the packaging materials used during shipping, and cutting down on energy consumption by purchasing high-efficiency equipment. When it comes to implementing environmentally friendly practices, doing good can also mean doing well: While most respondents said they view green initiatives as an expense, they also see it as a savings opportunity. Beauty company Kiehl’s, for example, recently switched from box to envelope shipping. The move reflected a push toward sustainably, but it also ended up reducing Kiehl’s product shipping costs.

## **4. DISCUSSION AND EXAMPLES**

The successful application of advanced warehouse technologies leads to increased productivity, better quality and cost savings. The Perftech.Largo ERP software is used. is a simple and technically updated software for creating effective comprehensive business information systems that can at any time provide users with the desired status information in the company. The LARGO system has several working modules that are used in the organization and operation of a company: finance, human resources management, sales and procurement, external operations, production, material handling, storage.

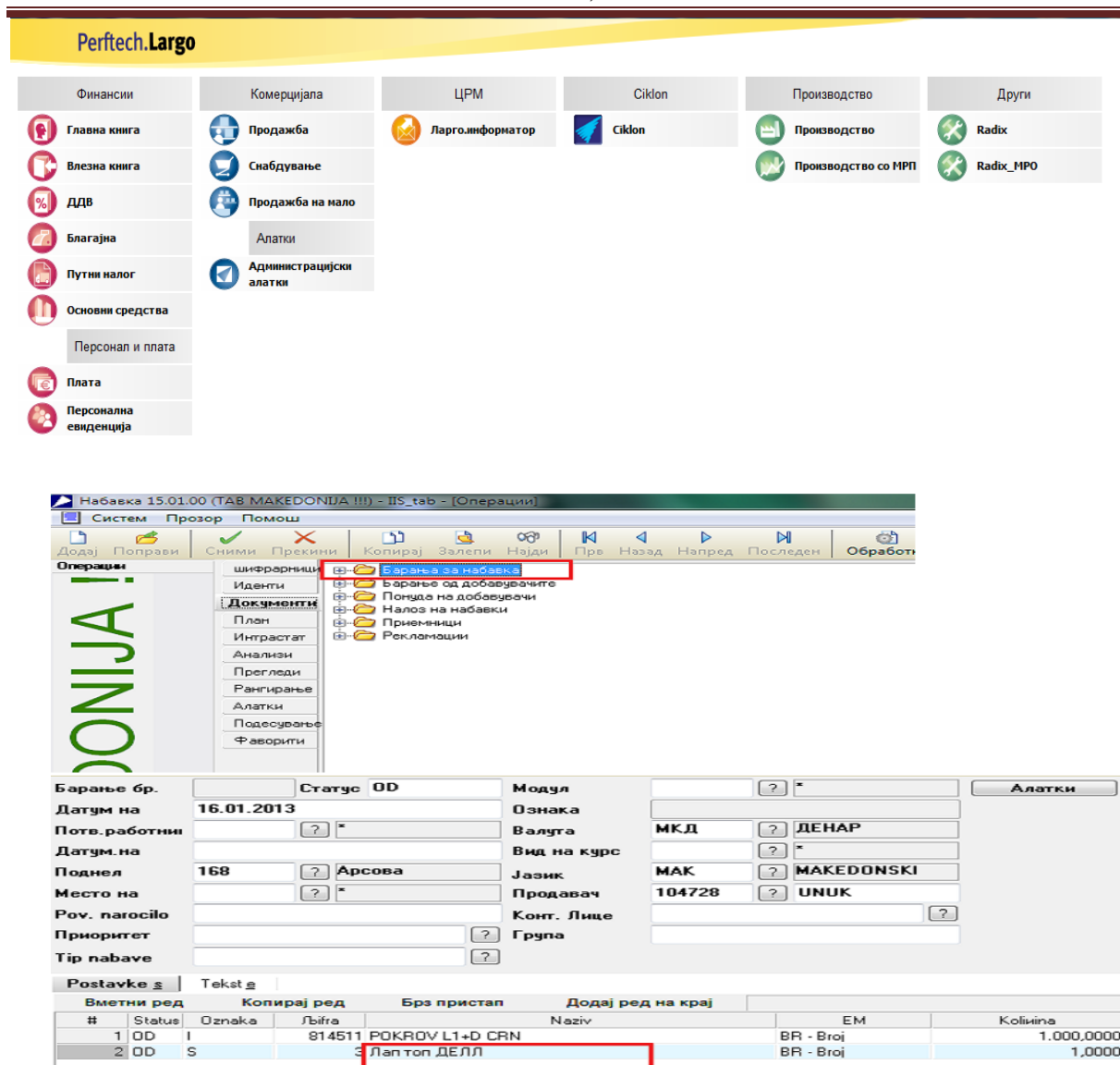


Figure 1. Window of Largo software

Производство 20.01.00 (TAB MAKEDONIJA !!!) - IIS\_TAB - [DeLnaLogi]

Систем Датотека Уреди Запис Прозор Помош

Додај Поправи Сними Прекини Копирај Залежи Најди Прв Назад Напред Последен Обработка Помош и.Прозор

Операции  
Испратница [број] - ins

План на производство DeLnaLogi

ГЕНЕРИРАЊЕ НА РАБОТНИ НАЛОЗИ

Извештаи Обработки Бришење Подесување pro

Преглед и обработка на раб.налози

ГЕНЕРИРАЊЕ НА РАБОТНИ НАЛОЗИ

Нарачки Матични Задруженија Разбивање Генерирање Нето потреби ен.од отпловикан Подесување

Над.док. Бро?

Plan proizvodnje [Zap.lst.plana]

#	Zap.lst.plana	Ozn.plana	Odgovorni	Lbifra SM	Status	Datum plana
505440	505440-27PET		671	27524	PO	07.07.2017
505441	505441-27PET		671	27523	PO	07.07.2017
505442	505442-27PET		671	25623	PO	07.07.2017
505444	505444-27PET		671	27523	PO	07.07.2017
505445	505445-27PET		671	27524	PO	07.07.2017
505446	505446-27PET		671	27524	PO	07.07.2017
505447	505447-27PET		671	25655	PO	07.07.2017
505448	505448-27SOB		671	25623	PO	08.07.2017
505450	505450-27NED		475	27523	PO	09.07.2017
505451	505451-27NED		384	27523	PO	09.07.2017
505452	505452-27NED		671	27523	PO	09.07.2017
505453	505453-28PON		671	27523	PO	10.07.2017
505454	505454-28PON		671	25623	PO	10.07.2017
505455	505455-28PON		671	25624	PO	10.07.2017
505456	505456-28PON		222	26540	PO	10.07.2017

Производство 17.01.00 (TAB MAKEDONIJA !!!) - IIS\_TAB - [Испратница [број] - insert]

Систем Датотека Уреди Запис Прозор Помош

Додај Поправи Сними Прекини Копирај Залежи Најди Прв Назад Напред Последен Обработка Помош и.Прозор

Операции  
Испратница [број] - ins

Број 19

Статус OD

Дат. На испорака 15.07.2016

Верзија

БОН

Алатки

Модул 19

Датум 15.07.2016

Перон

Купувач 104505

Објект

МТ 9526

Валута MKD

ДЕНАР

Конт. личност 104505

Тип на дев. курс

СРЕДЕН КУРС НА НЕ

Нарачки на купувачи 104505

Усл. на испорака

Изготвила 127

Нач. на плаќање

Застапник

Нач. на испорака

ТМ на плаќачот 9525

Јазик

Прием.скл. 525

Инос

Прием.лок. 1

Нормална испратница

Партн. Ценовик

Цена на datum dobave

Postavke g Ostalo g Tekst g Transport g Banke g Popusti g Elektronska izmenjiva g Provizije g

#	Znak	Lbifra	Koda	Naziv	EM	Kol.odpr.	Cena3	Fak.kol.	Standard	SM	Lok.	Ozn.led
1	0	10845		45Ah-R EN609A L3 BBV B13 KM	BR	0,0000	0,0000000	0,0000	STSLJ4	502	1	

5 наплати  
1 избирај се  
2 копирај на сите ставки  
3 копирај на правите ставки  
4 внеси наплати на ставки  
5 внеси наплати на сите ставки  
6 внеси наплати на правите ставки  
7 предвиди пречек наплати, локација, вид на промет  
8 собирање шарки  
9 раздели по шарки  
10 раздели по шарки - како раздели  
11 раздели по шарки - за раздели работи на парода  
12 раздели по шарки - за раздели делови налог

Продажба 17.01.00 (TAB MAKEDONIJA !!!) - IIS\_TAB - [Испратница [број] - insert]

Систем Датотека Уреди Запис Прозор Помош

Додај Поправи Сними Прекини Копирај Залежи Најди Прв Назад Напред Последен Обработка Помош и.Прозор

Операции  
Испратница [број] - ins

Број 11

Статус OD

Дат. На испорака 15.07.2016

Верзија

БОН

Алатки

Модул 11

Датум 15.07.2016

Перон

Купувач 104505

Објект

МТ 88604

Валута MKD

ДЕНАР

Конт. личност 104505

Тип на дев. курс

СРЕДЕН КУРС НА НЕ

Нарачки на купувачи 21609131

Усл. на испорака

Изготвила 172

Нач. на плаќање

Застапник

Нач. на испорака

ТМ на плаќачот

Јазик

Прием.скл.

Инос

Прием.лок.

Нормална испратница

Партн. Ценовик

Цена на datum dobave

Postavke g Ostalo g Tekst g Transport g Banke g Popusti g Elektronska izmenjiva g Provizije g

#	Znak	Lbifra	Koda	Naziv	EM	Kol.odpr.	Cena3
1	0	0			BR	0,0000	

Идентификација [Lbifra = 419275]

#	Lbifra	Koda	Ime	Dolgi naziv
1	419275		75Ah-R MF EN750A L3 BBV	75Ah-R MF EN750A L3 BBV B13 ST

Figure 2. Generated work orders - examples

**Продажба 17.01.00 (TAB MAKEDONIJA !!!) - IIS\_TAB - [Испратница [Број] - insert]**

Систем Датотека Уреди Запис Прозор Помош

Додај Поправи Сними Прекини Копирај Залепи Најди Прв Назад Напред Последен Обработка Помош и.Прозор

Операции  
Испратница [број] - insert

Број: [ ] Статус: OD Дат. На испорака: 15.07.2016 Верзија: [ ] BON Алатки

Модул: [ ] Бр. на раб. нал. [ ] Доспеано: 0.00

Ознака: [ ] Датум: 15.07.2016 Перон: [ ] Неопеано: 0.00

Купувач: 104505 ? TAB MAK D.O.O. Објект: [ ] ВКУПНО: 0.00

MT: 8526 ? СЕРВИС СКОПЈЕ Валута: MKD ? ДЕНАР

Конт. личност: [ ] Тип на дев. курс: 1 ? СРЕДЕН КУРС НА НБ

Примач: 104505 ? TAB MAK D.O.O. Попуст%: [ ] Денови до плаќ. [ ]

Нарачки на купувачи: [ ] Усл. на испорака: [ ]

Изготвил: 127

Застапник: [ ]

ТМ на плаќачот: 9525

Прием. скл.: 525

Прием. лок.: 1

Партнери [Шифра]

OK Откажи Уреди Запис

# Шифра Назив на партнерот Полно име на партнерот

104505 SPECIALIZIRANA TRGOVINA Z ELEKTROTEHNICNIMI MATERIA

3 JUB D.O.O. JUB KEMICNA INDUSTRIJA D.O.O.

4 TRADE CELJE

5 KOVINOTEHNA D.D. TE VEL.P.240

6 IMP MONTAZA MARIBOR D.D.

7 JEKLOTEHNA V STECAJU

8 ILIRIJA PE LENDAVA

Postavke s Ostalo g Tekst

Вметни ред Копирај р

# Знак Шифра Лбфа

1 ? 0

**Продажба 17.01.00 (TAB MAKEDONIJA !!!) - IIS\_TAB**

Систем Датотека Уреди Запис Прозор Помош

Додај Поправи Сними Прекини Копирај Залепи Најди Прв Назад Напред Последен Обработка Помош и.Прозор

Операции  
Испратница [број]  
Баранье испратници  
Испратница [број] = 21  
Фактура [број] - insert

Број: [ ] Статус: OD Врска: [ ] Алатки: [ ] BON

Ознака: [ ] Датум: 15.07.2016 Бр. На куп. [ ]

Тип: RA ? Модул: 806 ? Дат. На испорака: [ ] Денови до плаќ. [ ]

Купувач: [ ] Дат. валута: [ ] Внес % за осигур. ризици [ ]

Интрастат [ ] Обврзан на данок [ ] Дата на царина [ ] Ценовник на ставки [ ]

Примач: [ ] Период [ ] Попуст%: 18.00 Валута: MKD ?

Конт. На лица: [ ] Шиф. на пренос: 10 ? PRODAZBA AKOMI TC PC ?

Изготвил: 172 ? ДУКМЕЦИЕВ, МИХА Тип на дев. курс: 1 ? СРЕДЕН КУРС НА

Застапник: [ ] Усл. на испорака [ ] Партн. Ценовник [ ] 1-spr. statusa

MT: 27000 ? СТ. ПРОИЗВ. АК.-В Нач. на испорака [ ] ДОСТАВА НА СТР [ ] 2-izpis

Валута: MKD ? МАКЕДОНСКИ ДЕН Нач. на плаќање [ ] VIRMANI [ ] 6-odv. dok

Јазик: MAK ? МАКЕДОНСКИ Износ [ ]

Postavke s Ostalo g Tekst g Transport/Carina t Banke b Popusti u Trajniki j Intrastat g Elektronska izmenjava m Provizije z

Вметни ред Копирај ред Брз пристап Додај ред на крај

# Знак Шифра Назив ЕМ Кол. на исп. Тип на цена Цена/ Проц. На попуст На пор

1 ? 0 000000000 0,00 0,0000

BR - Број

Испратница [Број = 21602161]

OK Откажи Уреди Запис

# Број Осн. статус Статус Датум Купувач Примател Конт. личност Зак

21602161 PO PO 13.07.2016 900870 900870

Figure 2. Generated work orders - examples

## 5. RESULTS AND DISCUSSION

The simulation program begins with a temporary presumption that the storage materials from warehouse needed for reproduction are available in the input data of the warehouse. All work orders are processed and sent to the data entry of the warehouse. Priority orders regulate execution and are defined from the time they appear in the exit data of the warehouse, the time needed for transport to the client and the given delivery date. The user has a semi-product warehouse that enables normal operation of the production process and optimal supply time.

## 6. CONCLUSION

The emphasis of this paper is on the synchronization of all activities within the production system, which is a constant challenge and successful production for the business as a whole. In order to achieve this research task, it is necessary to begin with the structure of the production system and to emphasize the hierarchy of objectives, as well as the strategies that should be applied to their realization. The stock inventory status is a bit important.

---

Advanced warehouse systems and procedures are particularly important. All information systems and other tools are appropriately necessary. The vulnerability of the proposed principle is assessed by computer simulation, using the initial data from each considered industry.

## REFERENCES

- [1] Aberdeen Group, Inc. 2007. Warehouse Automation-What's Really Working. URL: [http://www.forteindustries.com/media/5819/rep\\_warehouseautomation\\_whatsreallyworking.pdf](http://www.forteindustries.com/media/5819/rep_warehouseautomation_whatsreallyworking.pdf). Accessed: 2 February 2016
- [2] Boston Globe Media Partners, LLC. 2012. Amazon Buys Warehouse Robotics Start-Up Kiva Systems for \$775 Million. URL: [http://www.boston.com/business/technology/innoeco/2012/03/amazon\\_buys\\_warehouse\\_robotics.html](http://www.boston.com/business/technology/innoeco/2012/03/amazon_buys_warehouse_robotics.html). Accessed: 2 February 20
- [3] BusinessWire. 2010. Crate and Barrel Adopts Kiva Warehouse Automation System to Increase Profitability and Reduce Carbon Footprint. URL: [http://www.businesswire.com/news/home/20100209005025/en/](http://www.businesswire.com/news/home/20100209005025/en/Crate-Barrel-Adopts-Kiva-Warehouse-Automation-System) Crate-Barrel-Adopts-Kiva-Warehouse-Automation-System. Accessed: 10 February 2016 California
- [4] Deutsche Post DHL. 2013c. Greening the warehouse URL: <https://www.dhlsupplychainmatters.dhl.com/sustainability/article/296/greening-the-warehouse>. Accessed 7 December 2014
- [5] Madison Gas and Electric Company. 2016. Managing Energy Costs in Warehouses. URL: [https://www.mge.com/saving-energy/business/bea/article\\_detail.htm?nid=1739](https://www.mge.com/saving-energy/business/bea/article_detail.htm?nid=1739). Accessed: 30 March 2016
- [6] Technology Advice. 2013. How Kiva Systems Is Changing the Future of Warehouse Work. URL: <http://technologyadvice.com/business-intelligence/blog/kiva-systems-changingfuture-warehouse-work>. Accessed: 8 December 2015 Technovelgy. 2016. What is RFID?. URL: <http://www.technovelgy>
- [7] Warehousing & Logistics International. 2016. Greening the warehouse. URL: <http://warehousinglogisticsinternational.com/practice-details/greening-the-warehouse-1>. Accessed: 20 January 2016
- [8] Westfalia. 2016. Increase warehouse efficiency with an AS/RS URL: <http://www.westfaliausa.com/products/automated-storage-retrieval-systems>. Accessed: 19 January 2016