IT rešenja u upravljanju ljudskim resursima

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Sažetak: Informacioni sistemi imaju sve veći uticaj na moderno poslovanje. Brzo menjaju poslovne sisteme i postojeće poslovne modele. Upravljački pristup je od suštinskog značaja za sve poslovne sisteme i podsisteme, kao npr. ljudske resurse, ako žele da opstanu, ali danas sve faze procesa upravljanja ne mogu da se odvijaju bez podrške informaciono-komunikacionih tehnologija. Brze i velike promene u okruženju u kojem je poslovanje praćeno neizvesnošću i rizikom, dovode do potrebe za primenom adekvatnih tehnologija u cilju povećanja fleksibilnosti, preciznosti, kao i eliminisanju ili smanjenju pojave grešaka koje umanjuju vrednost poslovne aktivnosti. Sve upravljačke aktivnosti se zasnivaju na razmeni podataka između eksterne i unutrašnje sredine, tako da na osnovu tačnih informacija menadžeri mogu da kontrolišu postizanje cilja. Proces globalizacije nameće pravila igre, dok znanje i informacije određuju poslovni sistem unutar organizacija. Informaciona tehnologija je ključni faktor koji omogućava menadžerima da upravljaju rizikom i zadovolje zahteve turbulentnog okruženja. Ovaj rad ukazuje na mogućnosti primene savremenih IT rešenja u upravljanju ljudskim resursima, analizirajući njihove prednosti i nedostatke.

Ključne reči: HR softver otvorenog koda, informacione tehnologije, poslovni sistemi, upravljanje ljudskim resursima

IT solutions for human resources management

Abstract: Information systems have a growing impact on modern business. They rapidly change business systems and existing business models. Management approach is essential to all business systems and subsystems, i.e. human resources, if they want to survive, but today all phases of the management process cannot take place without the support of information and communication technology. Rapid and large changes in the environment in which business is accompanied by great uncertainty and thus a huge risk, lead to necessity for applying adequate ICT that would increase flexibility, precision and eliminate or reduce errors' occurrence that diminish the value of business activity. All management activities are based on information flow of external and internal environment, so on the basis of accurate information managers could control the attainment of the objective. Globalization process imposes game rules; further, knowledge and information determine business system within organisations. Information technology is the key factor that allows managers to manage risk and meet demands of a turbulent environment. This paper emphasizes the possibility of applying contemporary IT solutions in human resources management, analyzing their advantages and disadvantages.

Key words: business systems, open source human resource management systems, human resource management, information technologies

1. Introduction

It is a common fact that everyone in the business system should work together to meet needs of the customer (beside profit), which means that profitable business, among other things, requires money, information, human resources and ways for obtaining or producing goods and services. Information technology plays an important role because it affects the business system as a whole, as well as many other functions within the company.

With the advent of the information society, human resources management with performing managerial tasks related to personal issues, employment, training, assessment etc. (Dessler, 2015), has undergone major changes. First of all, due to the emergence of the Internet and new jobs, human resources had to evolve and transform themselves digitally. Software solutions have become an indispensable part of human resources management and have greatly accelerated the recruitment process and reduced the need for additional paperwork.

Open source software today is an ideal solution for newly-opened business ventures, as well as for small or medium-sized enterprises. Open source software (according to Opensource) are most often free solutions, i.e. (according to Free), but they can be partially free, (according to Freemium). Nowadays, the difference in the benefits provided between the licensed software and the open source software is being reduced.

Cloud computing does not represent a passing mode, nor a revolution in electronic commerce. Instead, most companies are likely to use a combined IT environment in which applications, infrastructure, and business processes will be implemented through public and private CCs, and possibly using a hybrid cloud model. In any case, the undeniable fact is that CC changes existing business models.

2. New technologies in business environment

The growth rate of data is large, so economy i.e. the business environment presents a very large amount of data that creates the need for strong and modern information systems. The upper layers of information systems are directly related to functions of business systems, therefore, concepts' relations Big Data, Cloud computing and IoT system, are defined.

Cloud computing is present everywhere in the modern business environment. Cloud-based HR systems give businesses the computing power and the ability to survive today. There are advantages in using cloud HR software, such as less paperwork, fast deployment of HR systems, security issues, increased employee engagement, real-time and accurate performance assessments, 24/7 access to pay and benefit information, giving companies easy access to innovation, predictive analytics that promotes employee retention and loyalty, etc.

In the business environment Big Data concept represents vast and complex amounts of data. One of infrastructure solutions of above mentioned concept is a combination of the analytical platform Hadoop with NoSQL system. Big Data provides the ability to process data in real time, with searching option using the Map Reduce framework. For example, Big Data systems allow analytical processing of data collected on planning, organizing, staffing, directing, controlling, recruiting, placement, performance appraisal, compensation and training, etc. The resulting knowledge is transferred to managers, in order to define decisions/ strategies. Big data could be a part of an complex advanced analytical system, which is a solution.

Figure 1: Big Data - holistic approach
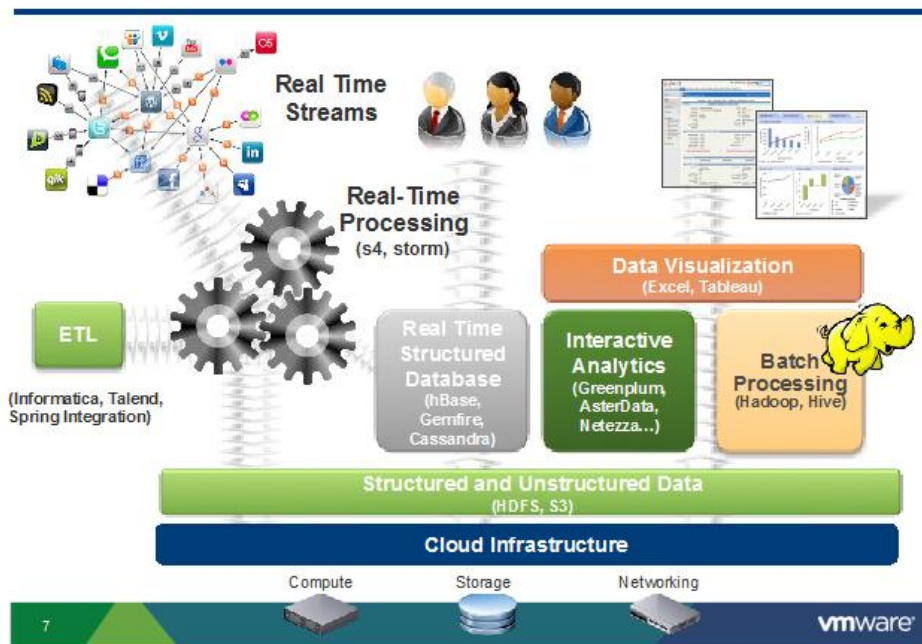
Source: (WMware, 2016)

Further, according to the Economist Intelligence Unit, the research and analysis division of the Economist Group and the world leader in global business intelligence, it is found that 82% of organizations planned to either begin or increase their use of big data in HR before the end of 2018. (Economist Group, 2018)

As Cloud and Big Data platforms, the IoT concept (Internet of Things) becomes increasingly common in the business environment. These are devices called „things" which in their structure have processor systems and other components, with the possibility of data exchanging. Predictions of the International Corporation for data analysis (International Data Corporation - IDC) are that by the year 2018 about 40% created IoT data will be stored, manageable and used by systems that are near or at the network edge. (Langovic, Pazun, 2016)

3. Open source software for human resource management

Nowadays open source human resource management systems (HRMS) become very popular concept even still relatively young. They give a lot possibilities or alternatives for human resource management, as well as become more competitive to Oracle and SAP, market leaders in this field.

Following open source business software applications for human resource management will be explained.

Orange HRM software. Orange HRM software is open source software, web-oriented. It has a user-friendly experience and a very wide range of tools that facilitate the work of human resources management. Given software has a trial period of thirty days, after which it should be paid. This software solution uses over 3,500,000 users. Many users state that its main advantage is its user-friendly experience.

Open source ERP software. Open source ERP software is also an open source software that is web-oriented and there is no need for installation, as well as it is designed for all types of businesses. Given software is free. Its advantages are the database and transparency of personal data. This software is mainly used by companies that are only starting up and whose number of employees is up to 100.

Odoo software. Odoo software is open source web-oriented software, which is partially free, that is, the first wanted application is free, and others are paid. In other words given software is an example of a freemium model. For human resources, it offers several solutions which cover recruitment, staffing, costs, assessment, fleet, and absenteeism. Each of these solutions has its own application. This software is ideal for all types of companies. It has 3,000,000 users.

HR.my software. HR.my open source software is completely free. This software does not require installation and it is web-oriented. It has a pleasant user experience, as well as excellent opportunities, such as electronic tracking of absenteeism, enhanced visibility of arrivals and departures from work, which greatly facilitates human resources management.

Teamdeck software. Teamdeck software is open source software that is partially free. In other words, it is free for a company that has up to 6 members, otherwise it should be paid for, and it represents a freemium form. Its advantages are that it has an excellent solution for resource planning, supervision of employee employment, etc. This tool facilitates human resources management in planning and organizing optimum work performance of employees.

4. Comparative analysis of HR software solutions

Each of these software solutions provides some benefits. Table 1 shows the most significant advantages of given five software solutions for human resources management.

Table 1. Comparison of benefits of HR software tools

Orange HRM	Open source ERP	Odoo	HR.my	Teamdeck
Role adjustment	Database resource	Planning departure	Role tracking Organization	Time tracking
Employee information	Employee information	Complete business software	Job planning	Job optimization
Time management	Time management and attendance monitoring	Salary management	Improve attendance at work	Schedule management

Source: (Pat Research, 2018 (authors' adjustment))

Introducing software solutions requires certain resources, primarily financial. If the company is small or just entering the market, ERP software such as SAP or DynamicNav can cause high costs. Each of these solutions has the option of free trial and it is recommended to test them, so that the company can identify for one of the above.

Requirements for introducing the aforementioned software solutions are presented in a comparative way in the following table.

Table 2: Comparison of requirements for the introduction of HR software solutions

Orange HRM	Open source ERP	Odoo	HR.my	Teamdeck
- Open source software - Professional license - on request - License for the company - on request	- Open source software – completely free	- Free - one application - Online plan - paid - Company plan – paid	- Open source completely free	- Startup plan – free up to 6 - Business plan - $3.99 monthly per user

Source: (Pat Research, 2018 (authors' adjustment))

In order to select the software, it is necessary to be analyzed, or to find out whether it visually responds to human resources managers, as well as its easiness to use. The user experience should be as good as it is, therefore, the software solution is more appealing to users. In this paper four aspects of user experience are presented and compared: easiness to use, additions and functionality, performance and customer support. Based on rates, final grade is generated for each software solution.

Graph 1 shows average user ratings of the five software listed. Ratings are generated from 1 to 10, where 1 represents the worst user experience, and by grade 10 the best user experience is presented.

Graph 2. Four parameters comparison of user experience
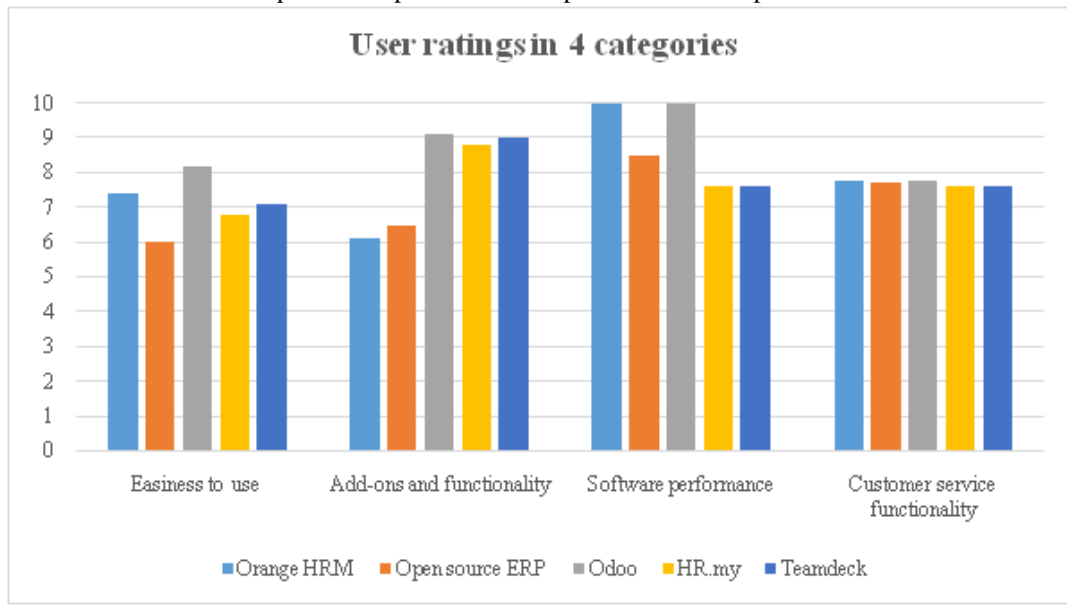
Source: (Authors, 2018)

Easiness to use aspect shows that Odoo software with rate 8.2 is the best choice for users, following by Orange HRM (7.4), as well as Teamdeck application (7.1). According to the second parameter, additions and functionality, it can be seen that the same software is leader with rate 9.1, as well, but close to it HR.my application has been noticed (8.8). Again, the best software performance, according to users' opinion and experience, is provided by Odoo and Orange HRM, both rated by 10. Finally, graph 1 shows that all presented solutions are almost equal, due to the characteristics customer service functionality (7.6-7.8). It can be concluded that due to given parameters, Odoo software is predominant.

At last, a graphical presentation of final users' grades is provided, relying on four parameters.

Graph 3. The average grades by four parameters

Final user rating

Orange HRM	Open Source ERP	Odoo	HR.my	Teamdeck
7.97	7.17	8.77	7.71	7.82
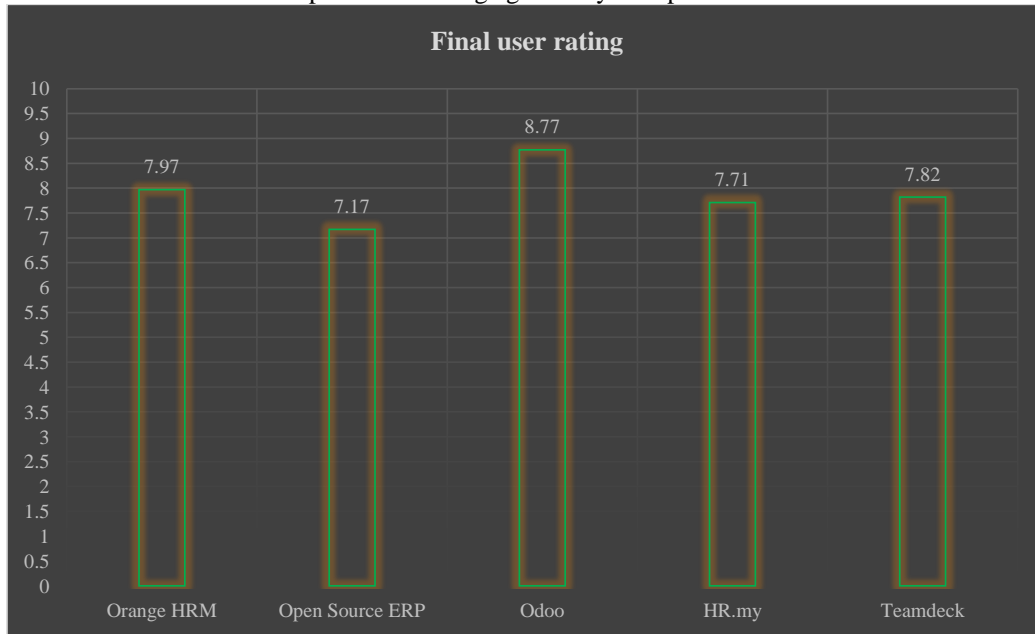
Source: (Authors, 2018)

Graph 2 shows that Odoo software has the best score of 8.77, three applications are almost even, while the worst average rating has Open source ERP (7.17).

5. Conclusion

Generally speaking, business systems represent a set of interrelated resources and one or more controlled operations which transform inputs into outputs. Mentioned technologies Cloud computing, Big Data and IoT represent a part of a modern information system which nowadays allow the company to survive on the market.

The human resources management, as a business subsystem, performs a wide range of tasks. For this reason, it is necessary to modernize or digitize it, so that the jobs can be done quickly and easily. The solutions presented in this paper show that in modern society there is a wide choice of open software solutions for human resources, which increasingly represent a serious competition between SAP and DynamicNav.

Open software solutions have the following benefits:
• Affordable solutions for small and medium enterprises.
• Some of them, more or less, have all the functions that are necessary for a modern manager of human resources.
• There is no need for additional investment in implantation and education of personnel.
• They can contribute to the improvement of human resources.
• The first step towards business modernization.

In this paper 5 open source software was analyzed and evaluated in four aspects in a comparative way. The average score shows that software solutions have very good grades (between 7 and 9). Finally, according to user ratings, Odoo has the best rating, while the worst one is Open source ERP.

Although the software solutions presented in this paper can be used in companies of all sizes, they are most often used in small and medium-sized enterprises, except the Odoo software solution, which is the most complete software of the offered ones, because it can be used in every function of the company.

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