

Marek Milosz¹

ERP IMPLEMENTATION AT POLISH ENTERPRISES – FROM BUSINESS AND END-USERS PERSPECTIVES

The article discusses the problems in assessing the effectiveness of the ERP system implementation from two perspectives: top management and end users. The results indicate a similarity between both view points, but also important differences. The assessment by end users are ambiguous. Despite the overall positive assessment of the implementation, they indicate serious problems in its quality.

Keywords: management information systems; ERP systems; ERP implementation; business benefits; end user opinion.

Мареk Мілош

ВПРОВАДЖЕННЯ ERP-СИСТЕМ НА ПОЛЬСЬКИХ ПІДПРИЄМСТВАХ З ТОЧКИ ЗОРУ БІЗНЕСУ ТА КІНЦЕВИХ КОРИСТУВАЧІВ

У статті розглянуть проблеми оцінювання ефективності впровадження системи ERP з двох точок зору: топ-менеджерів та кінцевих користувачів. Результати аналізу демонструють спільність обох точок зору, але одночасно є і серйозні відмінності. Оцінки кінцевих користувачів є доволі неоднозначними. Незважаючи на загальну позитивну оцінку впровадження, вказано також на серйозні проблеми якості таких систем.

Ключові слова: інформаційні системи управління; ERP-системи; впровадження ERP; переваги для бізнесу; оцінка кінцевих користувачів.

Рис. 6. Літ. 25.

Мареk Мілош

ВНЕДРЕНИЕ ERP-СИСТЕМ НА ПОЛЬСКИХ ПРЕДПРИЯТИЯХ С ТОЧКИ ЗРЕНИЯ БИЗНЕСА И КОНЕЧНЫХ ПОЛЬЗОВАТЕЛЕЙ

В статье рассматриваются проблемы оценки эффективности внедрения системы ERP с двух точек зрения: топ-менеджеров и конечных пользователей. Результаты анализа показывают сходство обеих точек зрения, но одновременно и серьезные различия. Оценки конечных пользователей неоднозначны. Несмотря на общую положительную оценку внедрения, они указывают также на серьезные проблемы качества таких систем.

Ключевые слова: информационные системы управления; ERP-системы; внедрение ERP; преимущества для бизнеса; оценка конечных пользователей.

Introduction. ERP (Enterprise Resource Planning) systems have a number of features, one of which is the most important. It is its comprehensiveness and the big scale of integration. The idea behind ERP is to support company management in all the areas. One coherent ERP system replaces many single-area ones by automating data processing and providing information necessary in the processes of business management (Holsapple and Sena, 2005; Kravchuk, 2011).

The feature of comprehensiveness is an advantage of ERP, because it decreases the costs of data processing, eliminating the unnecessary human work. However, comprehensiveness also means high complexity, as well as taking actions in the area of company management. These characteristics entail a high degree of complexity of

¹ Ph.D., Deputy Director of Institute, Institute of Computer Science, Lublin University of Technology, Lublin, Poland.

the ERP project, its length and the need for involving a lot of resources by a client. The risk of such projects is high. As a result, the percentage of failed ERP implementation projects is very high, closer to 70% (Barka et al., 2005; Barker and Frolick, 2003; Dantes and Hasibuan, 2011).

Causes for failures in implementing ERP systems are very different. These include (Ehie and Madsen, 2005; Finnelly and Corbett, 2007; Hong and Kim, 2002):

- improper selection of a system;
- lack of understanding of the implementation purposes;
- inadequate participation of top management in implementation;
- badly defined and implemented project;
- resistance to changes caused by implementation;
- inappropriate relationship with a supplier;
- limited end users training.

Implementation (and its success) of each system should be viewed from 3 sides (Somers and Nelson, 2004): supplier, customer and employee, using the system. Each of these parties perceives successful implementation differently (Amoako-Gyampah, 2004, McGinnis and Huang, 2007). In the article there will be presented two parties: a client (business perspective) and an employee (end user perspective).

Business perspectives of ERP implementation will be analyzed on the basis of the literature research, and end users perspective – via surveys (Kuna, 2011).

Polish market of ERP systems. There is a large group of ERP systems at Polish market. Some of them are production systems of global corporations, which are offered after the introduction of Polish interface and adjusting to Polish legislation. These are systems of: SAP AG (German company, full name: Systemanalyse und Programmentwicklung), Oracle, Microsoft and IFS AB (Swedish company, full name: Industrial and Financial Systems), QAD and many minor.

A significant part of ERP systems offered in Poland are systems for domestic production. These include Comarch systems (systems: OPT!MA and CDN XL), BPSC (ERP system: Impuls 5), UNIT4 TETA (system: Theta Constellation), MIKROBIT and many others.

According to IDC (IDC Report, 2010), 58% of large companies used ERP systems in Poland. However, with small and medium enterprises the situation is much worse. Only 22% of medium enterprises and only 6% of small ones use ERP systems in Poland. The share of small organizations (employing up to 100 employees) in business software in 2010 reached only 14% of the total value at Polish ERP market. Meanwhile, nearly half of the EU small enterprises have ERP systems.

Much more perspective for ERP vendors is Polish market of medium-sized companies. ERP vendors (e.g., Comarch or BPSC) for such companies increase shares at Polish ERP market, Fig. 1. Large and expensive ERP systems (e.g., SAP or Oracle) continue to have a significant market share, but their share is decreasing gradually.

The dynamics of Polish ERP market far exceeds the growth of the economy, which in Poland was positive despite the crisis. According to IDC Report (2010), in this area almost 15% increase of sales was observed. Also are increasing the market shares of Polish software vendors. In 2010 the share of Polish ERP systems measured by the value of licenses sale rose to the level of 38.3%. In 2009, the share of Polish suppliers was 2.7% lower and the rate was 36.5%.

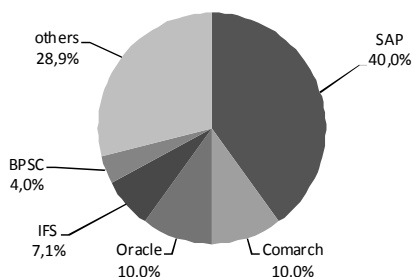


Figure 1. Polish market shares of ERP systems in 2010

Source: Own elaboration based on IDC Report, 2010.

The increase is not spectacular but it is the result of ERP implementation at medium-sized enterprises. The market of Polish suppliers is fragmented. Among all the ERP vendors at the Polish market, more than 60% are domestic producers. This means that foreign suppliers having over 60% of the whole market, do not exceed 40% in quantity.

Low saturation of small and medium enterprises by ERP systems in Poland is due to high costs mostly. For Polish companies a large system is still too expensive to purchase, implement and operate. The problem is, therefore, the economic efficiency of the ERP projects implementation.

Business view on ERP implementation. ERP systems implementation in a company is focused on achieving business benefits. This is the primary objective from a board's point of view. Some project managers perceive the success of an ERP project as of a classical system, as an implementation consistent with a plan, which means the aspects (Dantes and Hasibuan, 2011): budget, time, result.

During the implementation, depending on external conditions, there are other business prospects, which mean the objectives like: the scope of ERP system, range of an implementation project (list of tasks "to do"), velocity of implementation (project duration), resources used during implementation, and risks of a project.

The relationship between these categories is not clear, Fig. 2. For example, increasing the scope of an ERP system positively affects the benefits, but increases the risks, which in turn adversely affects them.

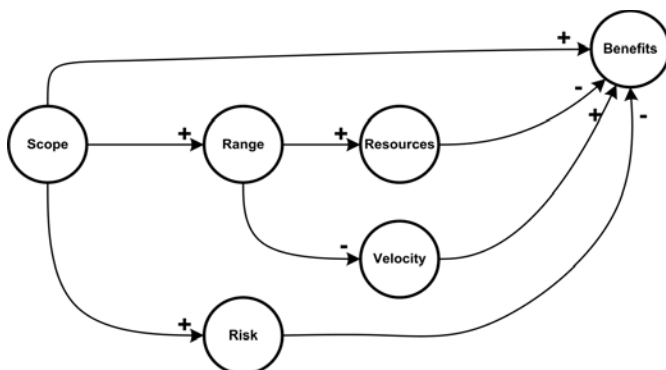


Figure 2. Casual diagram of relationships between ERP implementation objectives

Source: Own elaboration

Managers also clarify the concept of business benefits from an enterprise from ERP implementation. They expect the emergence of (Kemp and Low, 2008; Murphy and Simon, 2002, Shang and Seddon, 2002) inventory and personal reduction, productivity, order and cash management improvement, transportation and logistics costs reduction etc. The validity of individual factors varies. Most of the managers indicate the important role of technological aspects (Olhager and Selldin, 2003; Singh, 2008) and negligible: personnel and procurement costs reduction. Practically never a decrease in information technology costs is expected (Olhager and Selldin, 2003).

Another approach to expected benefits from ERP implementation is presented in Collegiate Project Services research. Analysis of the expectations of hundreds of stakeholders in 12 higher education institutions preparing to implement ERP systems has enabled to order (Kay, 2009) top 10 benefits (in brackets the number of institutions reporting this benefit):

1. Enhanced technology for the institution (91%);
2. Efficiency in processes (91%);
3. Integrated, consistent information (66%);
4. Easier reporting (66%);
5. User-friendly system (66%);
6. Access to data (50%);
7. Ability to provide better customer service (50%);
8. Increased functionality (41%);
9. Better communications across the institution (25%);
10. Increased security of data (25%).

The literature analysis shows that perception of success in ERP system implementation may be very different from a business pointview: from operational (as a project) through tactical (quickly obtained benefits) to strategic. Depending on the research the benefits are quite different.

Business benefits can be regarded as tangible and intangible (Murphy and Simon, 2002) and attempt to quantify them requires a separate discussion. Operational benefits are generally tangible and quantitative in nature, and strategic ones are intangible and non-quantitative (Murphy and Simon, 2002). The examples of low tangible and quantitative benefits are: support organizational changes, facilitate business learning, empowerment, building business flexibility for current and future changes or building common vision.

The attempt to assess strategic benefits is usually performed at the stage of operation of a system, long after implementation (Gattiker and Goodhue, 2005).

ERP implementation in end users' opinion. The end user perspective in ERP implementation can be quite different from business in general areas (Holsapple et al., 2005, Wu and Wang, 2006) and also in particular things, for example, security of data (Juszczak, 2011).

From the end users perspective, ERP systems implementation is evaluated from the following viewpoints: general, project and its results. Fig. 3 shows the areas and the indicators of ERP implementation evaluation from the end user perspective.

Evaluation of the ERP systems implementation by their users is possible only via case studies. In 2009-2010 at one of big companies in Lublin an ERP system of a Polish producer was implemented. As part of the work (Kuna, 2011) there were carried out the studies to evaluate the implementation according to the template presented in Fig. 3.

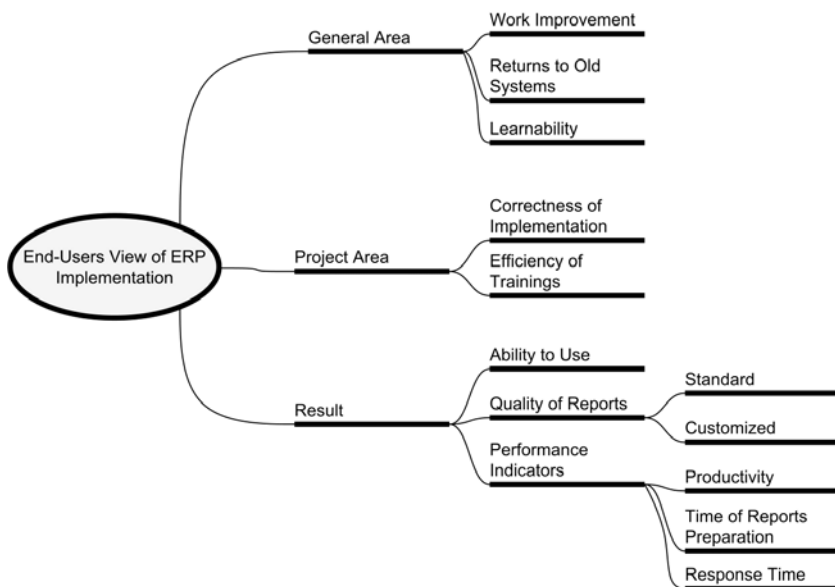


Figure 3. ERP implementation evaluation areas and indicators from end user perspective

Source: Own elaboration.

The study involved 43 users of the ERP system at the final stage of its implementation: operating under supervision. At this stage end users have access only not to a new system, but also to old systems, and consultants from a company-supplier of a system. For the study there were selected users of the most characteristic of the implemented system modules: Human Management and Accounting. The surveys were carried out during its work (Kuna, 2011), under the supervision of the author's article. The surveys were completed by employees of a company in way that ensures their anonymity.

The results of the questionnaire in the general area are shown in Fig. 4. More than 51% of the respondents declared the improvement of work as a result of ERP implementation. Unfortunately, a similar percentage of users declared often or very often returning to older systems during their work. Very positive results were on the question about the properties of learnability. Over 95% of respondents answered positively to the question: Have they been working easier with the systems after one month?

The correctness of the implementation process (Project Area from Fig. 3) was positively assessed by 48% of the respondents (though nearly 33% had no opinion). Similarly, efficiency of training was positively assessed by nearly 89% of the respondents.

In the area of result, the main assessment of implementation quality is the ability to use, quality of reports and performance indicators. After implementation the full knowledge of the operating system was reported (Kuna, 2011) only by 32% of the end users, and 56% admitted there is smaller or larger gaps in their knowledge of the operating system. The quality of the system operation results was evaluated in two types: standard and customized reports (i.e., adjusted to the needs of a user). User quality rating of two types reports are quite extreme, Fig. 5.

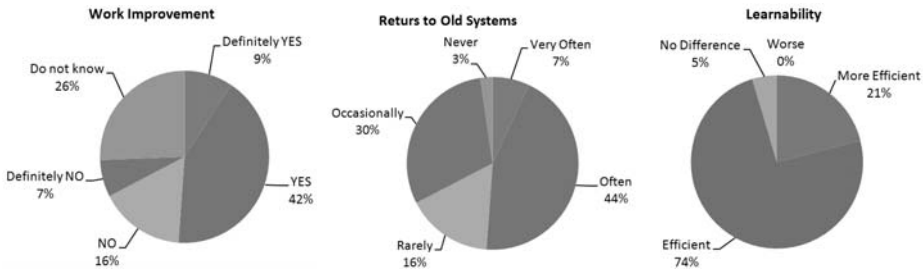


Figure 4. End user survey results in the general area

Source: Own elaboration based on (Kuna, 2011).

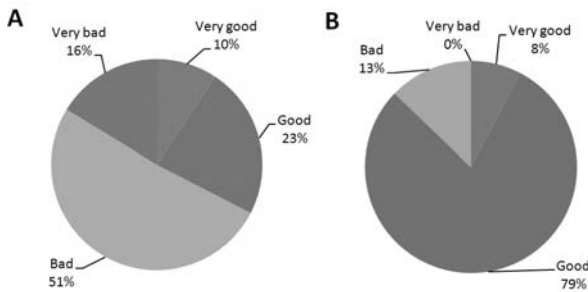


Figure 5. Quality of standard (A) and customized (B) reports

Source: Own elaboration based on Kuna, (2011).

In the end users (78%) opinion efficiency of their work after the implementation of the ERP system has increased (Fig. 6 on Productivity). Unfortunately, the time parameters of a new system (Time of Report Preparation and Response Time, in Fig. 6) by the majority of users were perceived as worse than under previous systems – 76% and 72% accordingly.

Summing the survey was a question: "In your opinion, does the new system improve the efficiency of the whole company?". This question is not quite correct in relation to end users who are implementing only the functionality of separate elements of the ERP system and do not have full knowledge of the entire enterprise. Nevertheless, it allows knowing feelings of end users in general. These feelings are clearly positive: "yes" or "definitely yes" answered more than 82% of the respondents. This indicates a positive evaluation of the ERP implementation in the perception of end users.

Conclusions. ERP systems in Poland are not sufficiently widespread. It seems that this is due to economic reasons. Additionally, there are not always positive assessments of the implementation processes of these systems in the opinion of managers and end users. Most end users when asked directly about the quality of implementation and its effectiveness evaluate it positively. However, answering questions and viewing partial indicators of the 'hard' ratings indicate that most users actually believe that the implementation process was not carried out properly.

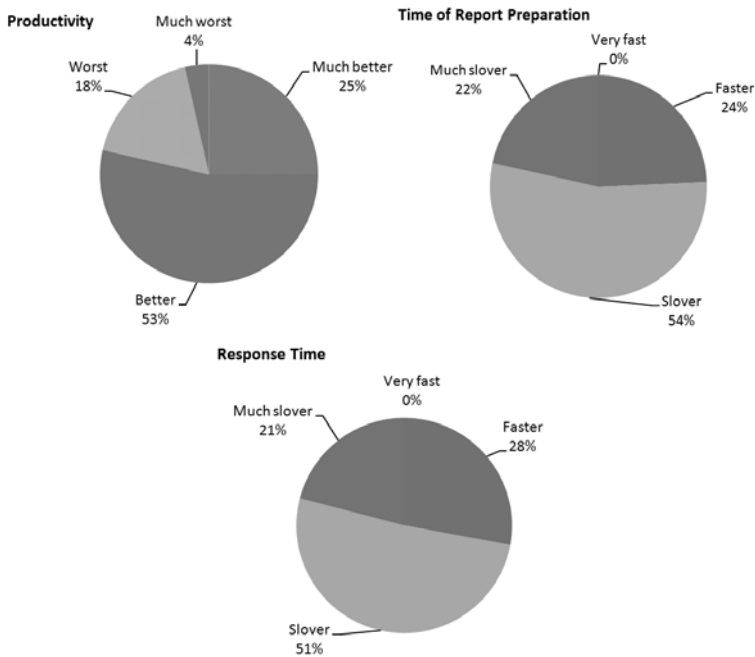


Figure 6. End user survey results on performance indicators

Source: Own elaboration based on Kuna (2011).

The results of the survey indicate the elements of the ERP systems implementation that should be improved to increase the probability of a project success.

References:

- Amoako-Gyampah K.* (2004). ERP implementation factors: A comparison of managerial and end-user perspectives. *Business Process Management Journal*, Vol. 10, Iss. 2, pp. 171-183.
- Barker T., Frolick M.N.* (2003). ERP Implementation Failure: A Case Study. *Information System Management*, Vol. 20, Iss. 4, pp. 43-49.
- Barki H., Oktamis S., Pinsonneault A.* (2005). Dimensions of ERP implementations and their impact on ERP project outcomes. *Journal of Information Technology Management* Vol. XVI, No. 1, 9 pp.
- Dantes G.R., Hasibuan Z.A.* (2011). The Impact of Enterprise Resource Planning (ERP) System Implementation on Organization: Case Study ERP Implementation in Indonesia. *IBIMA Business Review*, Vol. 2011, 10 p.
- Ehie I., Madsen M.* (2005). Identifying critical issues in enterprise resource planning (ERP) implementation. *Computers in Industry*, Vol. 56, pp. 545-557.
- Finnery S., Corbett M.* (2007). ERP implementation: a compilation and analysis of critical success factors. *Business Process Management Journal*, Vol. 13, Iss. 3, pp. 329-347.
- Gattiker T., Goodhue D.L.* (2005). What Happens After ERP Implementation: Understanding the Impact of Interdependence and Differentiation on Plant-Level outcomes. *MIS Quarterly*, Vol. 29, No. 3, pp. 559-585.
- Holsapple C.W., Sena M.P.* (2005). ERP plans and decision-support benefits. *Decision Support Systems*, Vol. 38, Iss. 4, pp. 575-590.
- Holsapple C.W., Wang Y.M., Wu J.H.* (2005). Empirically testing user characteristics and fitness factors in enterprise resource planning success. *International Journal of Human-Computer Interaction*, Vol. 19, Iss. 3, pp. 323-342.
- Hong K-K., Kim Y-G.* (2002). The critical success factors for ERP implementation: an organizational fit perspective. *Information & Management*, Vol. 40, pp. 25-40.
- IDC Report (2010). Poland Enterprise Application Software Market 2011-2015 Forecast and 2010 Vendor Shares.

- Juszczak M.* (2011). Impact of human factor in data security. *Actual Problems of Economics*, No. 6(120), pp. 359-364.
- Kay R.* (2009). Benefits of Implementation an ERP. *Collegiate Project Services*, 3 p., www.collegiateproject.com [Dec. 20, 2011].
- Kemp M.J., Low G.C.* (2008). ERP innovation implementation model incorporating change management. *Business Process Management Journal*, Vol. 14, Iss. 2, pp. 228-242.
- Kravchuk V.I.* (2011). Automated information system as a means of efficiency increase of economic control at an enterprise. *Actual Problems of Economics*, No. 7 (120), pp. 258-263.
- Kuna E.* (2011). Efficiency of Integrated ERP System on example Tetra Constellation. B.A. (Eng.) thesis under supervising of Milosz Marek, Lublin University of Technology, 53 p.
- McGinnis T.C., Huang Z.* (2007). Rethinking ERP success: A new perspective from knowledge management and continuous improvement. *Information & Management*; Vol. 44, Iss. 7, pp 626-634.
- Murphy K.E., Simon J.S.* (2002). Intangible benefits valuation in ERP projects. *Information Systems Journal*, Vol. 12, Iss. 4, pp. 301-320.
- Olhager J., Selldin E.* (2003). Enterprise resource planning survey of Swedish manufacturing firms. *European Journal of Operational Research*, Vol. 146, pp. 365-373.
- Schubert P., Williams S.P.* (2009). Constructing a Framework for Investigating and Visualizing ERP Benefits and Business Change. 22nd Bled eConference, eEnablement: Facilitating and Open, Effective and Representative eSociety. June 14-17, 2009; Bled, Slovenia, pp. 355-368.
- Shang S., Seddon P.B.* (2002). Assessing and managing the benefits of enterprise systems: the business manager's perspective. *Information Systems Journal*, Vol. 12, Iss. 4, pp. 271-299.
- Singla A.R.* (2008). Impact of ERP systems on small and mid-sized public sector enterprises. *Journal of Theoretical and Applied Information Technology*. Vol. 4, No. 2, pp. 119-131.
- Somers T.M., Nelson K.G.* (2004). A taxonomy of players and activities across the ERP project life cycle. *Information & Management*, Vol. 41, pp. 257-278.
- Wu J.H., Wang Y.M.* (2006). Measuring ERP success: the ultimate users' view. *International Journal of Operations & Production Management*, Vol. 26, Iss. 8, pp. 882-903.

Стаття надійшла до редакції 10.01.2012.