

Actual Development Trends in ERP Conception in Czech Enterprises 2005

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Abstract

The article summarises the long-term experiences of the author gathered during annual researches on the Czech ERP market and its trends for the publisher Computer Press Media. Based on the current development trends of this ERP market, we can extrapolate the main trends of ERP conception.

Key words: Enterprise Resource Planning (ERP), All-in-One, Best-of-Breed, Lite ERP, Extended ERP, Small and Medium-sized Enterprises (SME), Application Service Providing (ASP)

Introduction

ERP systems are currently considered as a given component of an enterprise's infrastructure. Significant funds are outlaid on their operation. However, we are constantly faced by differing - even completely opposing opinions, about just about every issue which concerns them. The Center for inVestigations into Information Systems - from its very inception, and on the basis of the professional orientation of its members and partners, has worked on delimiting as precise a definition as is possible of the specialist terminology as well as on the systematic investigation of the (Czech) ERP market.

1. Characteristics of the ERP conception from the point-of-view of actual developments in the market

Professionals and experts in the field have great difficulty in agreeing on just how and which product belong (or do not belong) to the category of ERP. In the course of creating an overview of ERP or analyses of the market by different researchers or institutions, confusion has been sown in the minds of the lay public thanks to a lack of clarity and imprecision in the terminologies used. At the same time, comparisons of products which it would be more appropriate to designate as "information systems" rather than "ERP systems" occur.

Neither should one omit to point out that the definition of "ERP" is also relentlessly being pushed forwards by providers through the continuous development of their products, and especially with regard to their primary and direct response to customers' requirements (e.g. the management of external processes, document flow management, managerial information reporting, etc.).

The basis for the definition and delimitation of ERP and its component characteristics is formed by the observations and knowledge arising from the worldwide research study into ERP systems conducted by the **Deloitte Consulting**

organisation, and published in 2000 in its report entitled: **ERP's Second Wave - A Global Research Report**. CVIS formulated the final form of the definition of ERP as follows:

- The authors' own observations and knowledge-base flowing from research conducted into the Czech ERP market over the period of 1999 to 2005.
- Observations and knowledge flowing from their consultancy activities for client organisations.
- Other literary sources, and especially from the study: **Accenture - Value of Enterprise Information Systems in the Czech Republic** (2001), and the specialist publications of T. H. Davenport (1998), T. Stevens (2001), and D. L. Olson (2004) (1, 4, 7, 13).

We define an information system of the ERP category as: "An effective tool which is capable of covering the planning and management of an enterprise's core/key internal processes (i.e. its resources and their transformation into outputs) - and this holds true for all levels, from the strategic to the operative."

By internal processes, we mean all of those processes, over which management has full control, and thus is the owner of the same. We can rank the following among these key internal processes: **Production, Internal Logistics, HRM (Human Resource Management), and Economics (financial matters)**.

Some of the most important characteristics and features of ERP systems are:

- The automatization and integration of the core company processes.
- The sharing of data and procedures and their standardisation across the whole company.
- The creation and accessibility of information in real time.
- The ability to process historical data.
- A unified approach to the implementation of an ERP concept.

Among the key requirements made on ERP systems are the following:

- The realisation of measurable benefits in the field of reductions in the overall cost structure arising from ineffective management of enterprises.
- The realisation of non-measurable benefits in the field of the management of enterprises' processes and the accessibility of information in real time.

We designate ERP systems, which manage to cover and to integrate all four of the above-mentioned internal processes as being, **"All-in-One"**. This category also includes several universal ERP solutions (usually products of foreign origin), but which however do not (usually) cover one of key processes - i.e. **Human Resources Management - further only HRM**.

In the course of project implementation, this process is usually assured through sub-deliveries by other, specialised providers (e.g. Elanor, Nugget, and such like). In view of the relative simplicity of integration of this functional utility into the ERP solution, the organisation is not faced with the problem of resolving further complications in the integration of the project. Providers of All-in-One systems usually guarantee the whole project themselves – including these sub-deliveries as well as their integration. Thus, the choice of an All-in-One ERP system should mean the realisation of only one implementation project for that enterprise.

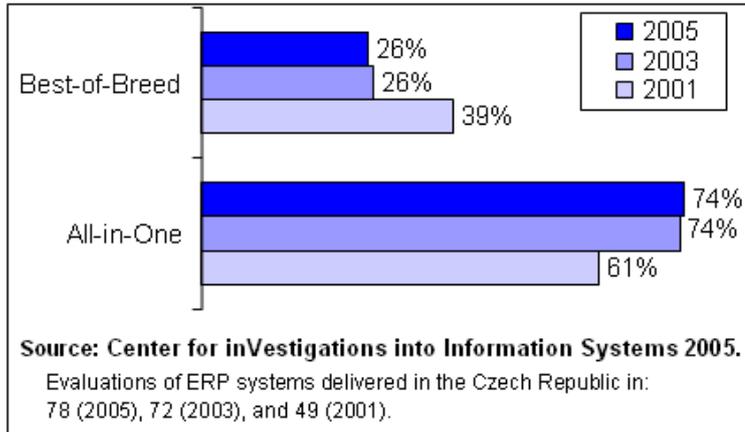
We also include those information systems which need not as a necessity cover and integrate all four internal processes in the category of ERP systems – but which do however, know how to provide clients either with detailed cutting-edge functionality (e.g. VEMA – finance, HRM and logistics), or which are oriented exclusively on certain fields of business activity (e.g. MBI Solutions – for the furniture-manufacturing industry). These so-called "**Best-of-Breed**" systems (i.e. individual systems with cutting-edge characteristics) are, in practice, implemented either individually – stand alone - (especially branch-related Best-of-Breed systems), or form a component of an enterprise's ERP concept (e.g. process-oriented Best-of-Breed systems) in conjunction with other information systems.

A specific category all of its own is that of the ERP systems of the market-leaders – i.e. the mySAP Business Suite, or Oracle E-business Suite. These solutions are characterised by their wide – and at the same time, detailed cover of enterprises' business processes, their complex range of branch-specific solutions and their across the board cutting-edge "Best Practices". Formally however, we include them with All-in-One systems since the top-priority requirement on ERP is its integration into an enterprise's business processes.

Tab. 1: Classification of ERP systems, by branch and functional orientation
(Source: Petr Sodomka/CVIS 2005)

ERP System	Characteristics	Advantages	Disadvantages
All-in-One	The ability to cover all of the key/core internal company processes, (HRM, production, logistics, financial matters)	High level of integration, enough for the majority of organisations	Less detailed functionality, costly customisation
Best-of-Breed	An orientation on specific processes or disciplines, does not necessarily cover all of the key processes	Cutting-edge detailed functionality, or else specific discipline solutions	More complicated coordination of processes, data inconsistency, the necessity to resolve more than one IT project
Lite ERP	Lighter (i.e. simplified) versions of standard ERP oriented on the small and medium-sized enterprise (SME) market	Lower prices, with an orientation on rapid implementation	Restricted functionality, user numbers, possibilities of expansion, etc.

Fig. 1: ERP systems, by discipline and functional orientation
(Source: Petr Sodomka/CVIS 2005)



Over time, enterprise working practices have required closer linkage between internal processes and:

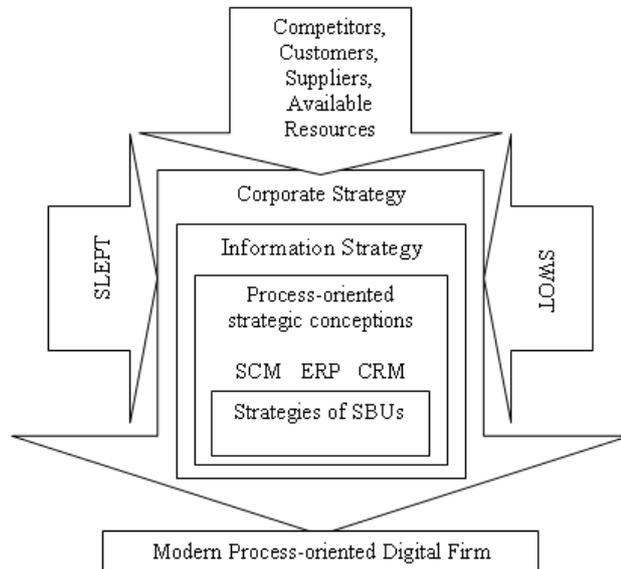
- **External processes**, where the owner is not precisely defined and their effective management is not fully under the control of the enterprise's management, (e.g. the field of Customer Relations Management – CRM, and Supply Chain Management - SCM).
- Processes in support of **managerial decision-making** (i.e. Management Information Systems - MIS).

For these reasons, ERP systems have developed into a form which is designated as: **ERP II**, or **Extended ERP**. A division of the individual solutions from this point-of-view would not, however, be a particularly happy one. Modern ERP systems today have proved themselves able to cover a highly-variegated range of enterprise business processes. Rare however, is the organisation which has managed to make best possible use of all (aspects) of their complex functionality. Instead of solutions (using) extensive ERP projects, enterprises have a tendency rather to exploit improvements to existing architectures by their linkage to other requisite functions. For this very reason, it is also highly-important that one of the characteristics of an ERP system be its openness and adaptability to its integration with other applications.

The modern networks of "(self-)learning organisations" should be able to direct tasks arising from coverall company strategies and the setting of goals towards the management of key enterprise business processes. For this very reason, the Center for inVestigations into Information Systems has defined process-oriented strategic conceptions, which – on the basis of the close interlinkage of an information system and the enterprise's business processes, enables the effective fulfilment of the strategic aims and objectives of that enterprise.

We have (chosen to) call the process-oriented strategies exploiting the opportunities (provided by) ERP systems and influencing the management of internal enterprise business processes the **ERP Conception**.

Fig. 2: The ERP Concept as a process-oriented strategic conception in modern digital firm (Source: Petr Sodomka/CVIS 2005)



Its practical realisation should then logically lead to:

1. Improvements in the flow of information towards the enterprise's business processes and the more effective functioning of the enterprise as a whole.
2. Improvements in the flow of information towards the individual managerial levels of the enterprise, improvements in the support of decision-making processes and the optimisation of the enterprise's business processes on the basis of feedback (mechanisms).
3. The more effective management of the ERP system itself throughout its lifecycle.

The ERP Concept thus should assist us to answer questions like, "How, and with whom should we carry out the implementation of a project?"; "How, and in what should we train the users of the system?"; "What working habits are essential for us to change?"; "When should we innovate software applications?", etc.

To answer the above however, it is essential that the people responsible for the ERP concept to know all of the requisite processes and (daily) functioning of the enterprise as a whole, as well as knowing how to make specific requirements on the ERP system and subsequently to retro-evaluate whether or not these requirements have been fulfilled. Only then may we talk about the ERP system having fulfilled the basic presuppositions in such a way as to have supported increases in the performance and value(-added) of that enterprise.

2. Research methodology

The author conducts an annual research study into the Czech ERP market, and has done so since 1999. This study is always conducted during the course of May by means of a questionnaire whose aims are:

1. To prepare an overview of the Czech ERP market for the prestigious Computer Press Czech publishing house and its specialist periodicals: BIZ, Connect!, and Computer.
2. To verify the general theories regarding this ERP market and to generate a situational and contextual linked theory.

In the course of implementing the written questionnaires, the author exploits his long-term experience with research studies conducted in to the Czech ERP market. The selection of sample enterprises is not only deliberate, but also based upon the following requirements and principles:

1. To acquire data from the maximum possible number of all ERP solutions providers on the Czech market, and this by means of repetitive questioning.
2. To exploit his personal contacts with concrete individuals responsible for the management of these provider companies – and this with the intent of motivating them and provoking interest about the research study in question.
3. When creating a sample of respondents for the purposes of written questioning, emphasis is placed upon ensuring that this corresponds to the basic set, i.e. to all those who meet the pre-set criteria – that they are manufacturers of ERP category software, or representatives of world-class ERP corporations operating in the Czech Republic. Therefore, the aim is to maximise the number of respondents, while bearing in mind the potential risks associated with a simplification of the techniques used and a certain degree of superficiality in such responses.
4. Prior experience indicates that, in the course of conducting research into the Czech ERP market, there is no direct proportionality or linkage between the size of the sample under investigation and any eventual simplification of the techniques used and, also to reduce the predictive response ability of the questionnaire itself. The respondents are sufficiently motivated to provide exhaustive responses by the possibility of presenting their products in publications, which they understand and take to be a certain form of self-promotion.

The questionnaire itself is based upon the following principles:

1. In cases where new questions are included in the established questionnaire, a pre-test is conducted on a smaller target group of respondents so as to verify whether or not the questions are formulated in a sufficiently comprehensible way and whether they provide the requisite response sense being sought.
2. The information is acquired exclusively from manufacturers of ERP systems or from representatives of world-class software corporations responsible for the provision of individual ERP systems in the Czech Republic. Thus, this information is not gained in principle from systems integrators – i.e. partner organisation responsible for the implementation of ERP systems in the

customers' premises. Only in cases where the partner network of providers (manufacturers) consolidates as a result of mergers or acquisitions (e.g. Infor and Oracle in 2005), is data originating from such systems integrators included in the data.

The validity of this research study is buttressed by the following aspects:

1. The sample under investigation is selected consciously and deliberately - in 2005, this represented approximately 90% of the basic sample group, and, from the perspective of the number of implementations of the included ERP systems this had to do with more than 95% of the basic sample group (market).
2. Information acquired through the use of the questionnaire method is always verified by telephone – and in selected cases, confronted face-to-face with the customers.

The reliability of this research study is based upon the annual repetition of the methods and approaches used, where any deviations are tracked and checked in sufficient time.

In view of the above-mentioned facts, it is therefore possible to generalise upon the results obtained on the basis of these written questionnaires.

3. Results of the research study into the realisation of ERP concepts in enterprises in the Czech Republic

The actual results of the research study into the Czech ERP market pointed up the following core/key development trends in ERP concepts in Czech enterprises:

1. In the majority of large-scale enterprises, the creation of ERP concepts is supported by applications software provided by the well-known SAP company. In the process, SAP has significantly strengthened its product portfolio directed at all types of enterprise – depending on size (e.g. mySAP Business Suite, mySAP All-in-One, SAP Business One). In addition, it offers large-scale organisations a special solution combining mySAP ERP with a set of highly-scaleable (variable and adjustable) applications based on the mySAP Business Suite system with the possibility of integrating these with the SAP NetWeaver platform. ERP concepts realised on the basis of mySAP ERP systems mean greater flexibility through the projection of changes in an enterprise's strategies into the realisation of the enterprise's business process and their innovation.
2. For the main competitors of SAP (i.e. Oracle E-Business Suite, SSA ERP LN, Microsoft Dynamics AX, IFS Application), there is not much room for growth in the large-scale enterprise market segment. This market is over-saturated, and there remains no room – apart from rare exceptions given by certain enterprise's entrepreneurial priorities, to anticipate its greater penetration by competitors' solutions. The above-mentioned products therefore will (be forced to) look for market-share rather to the medium-sized enterprise market segment.
3. What are the opportunities therefore for the implementation of ERP systems in the medium-sized and small-scale enterprises market segments? In order for us to be able to answer – at least in general, this

question, it is necessary to analyse the data shown in Table 2. This table summarises data published by the Czech Statistical Office and by CVIS for the global and very rough determination of the potential provided by the Czech entrepreneurial market – i.e. client organisations in which it is possible to validate the implementation of an ERP system for the management of enterprises' business processes.

Unfortunately, there is an insufficiency of relevant information available for a more precise determination of the (Czech) market potential. In addition, the results have been skewed by a variety of facts, of which we should perhaps mention a few:

- In enterprises recorded by CVIS as references to ERP systems; a significant penetration may well exist – a single subject (entity) may well be a multiple reference, if it uses more than one ERP system.
- CVIS does not record references to economic information systems (e.g. Money S3, Stereo 2005, and such like). These may be fully sufficient for many smaller economic subjects (financial entities) and prove to be entirely sufficient for the management of these enterprises' agendas. And even in these cases - there could exist a penetration between users of economic (financial) systems and users of ERP systems.
- Research by the Czech Statistical Office into the field of the "Information Societies", which could have served as the most suitable guide for comparisons and the estimation of the potentials of these markets, does not in fact present actual (i.e. topical) data (2002), nor does it include valuation categories, which would better be able to reflect the use of company informatics in Czech enterprises (3).

On the basis of the above-mentioned values, it is only possible to state the fact that the **potential SME segment in the Czech Republic for the purchase of standard ERP solutions is significant**. Proof of this lies above all in the difference in data regarding market penetration (CVIS, the values shown represent more than 90% of the Czech ERP market) and the data regarding the number of economic subjects (financial entities) in the commercial or state enterprises, and cooperatives category (Czech Statistical Office); with the difference somewhere in the hundreds-of-thousands.

Tab. 2: Potential and actual users of ERP systems.

(Source: Petr Sodomka/CVIS 2005, Czech Statistical Office 2002)

Category:	Absolute №:
№ of entities in the "Register of Economic Subjects" (Companies & Business Register) (Czech Statistical Office as of 31. 12. 2004)	2,352,601
№ of economic entities in the commercial or state enterprises, and cooperatives category (Czech Statistical Office as of 31. 12. 2004)	258,674
№ of references to: All-in-One ERP in the large-scale enterprise segment (Czech Statistical Office as of 31. 12. 2004)	1,185

Category:	Absolute №:
№ of references to: All-in-One ERP in the medium-sized enterprise segment (Czech Statistical Office as of 31. 12. 2004)	4,078
№ of references to: All-in-One ERP in the small-scale enterprise segment (Czech Statistical Office as of 31. 12. 2004)	4,690
№ of references to: Best-of-Breed ERP (Czech Statistical Office as of 31. 12. 2004)	4,360
Category:	Relative №:
Share of economic entities using personal computers for business purposes (Czech Statistical Office as of 31. 12. 2002)	96.39 % *
Share of economic entities using local area networks - LANs for business purposes (Czech Statistical Office as of 31. 12. 2002)	28.95 % *

Notes: (*) Information about the calculation methodology can be found here: www.czso.cz (3).

- The SME ERP system segment has been dominated for a long time by domestic providers/suppliers (e.g. LCS International, ALTUS Development, Vision Praha), which is also clear from the latest results of research into the Czech ERP market. As regards products from world-class corporations in this market, the most significant are only two – the Microsoft Navision system and the solutions of the SAP organisation. For SAP, one can anticipate that, in the place of the SAP All-in-One product, smaller enterprises will be more attracted to SAP's Business One product. For this very reason, SAP has introduced an indirectly commercial model for this ERP system – similar to the long-successful Microsoft Navision business model.

Fig. 3: All-in-One ERP systems, by number of implementations – in the small-scale enterprise market segment (Source: Petr Sodomka/CVIS 2005)

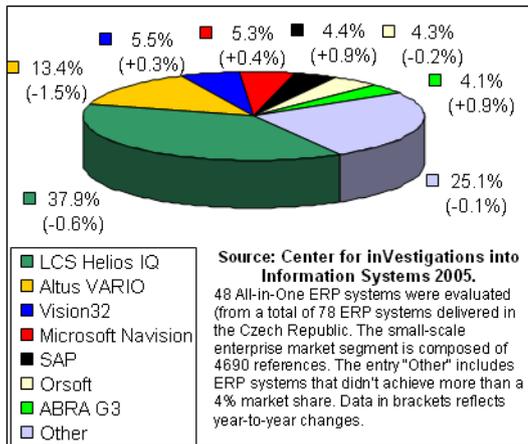
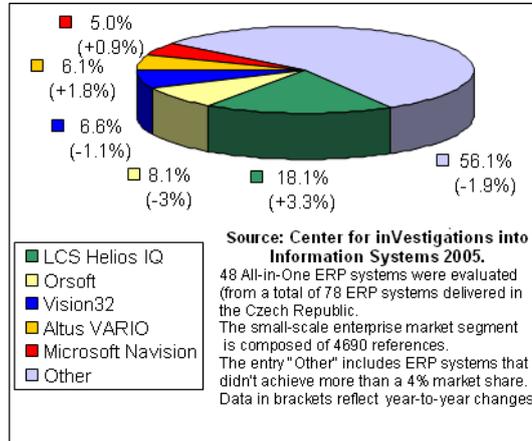
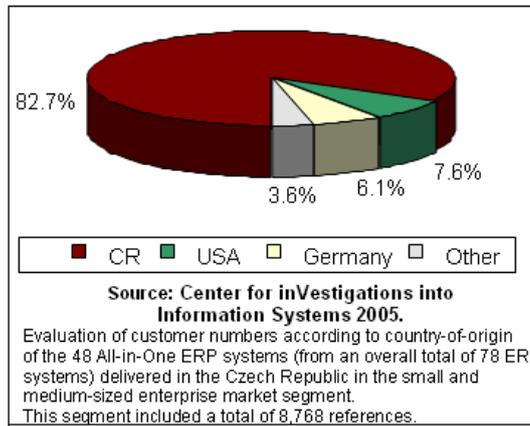


Fig. 4: All-in-One ERP systems, by number of implementations – in the medium-large enterprise market segment
(Source: Petr Sodomka/CVIS 2005)



- For Czech clients, ERP concepts are implemented especially on the basis of domestic ERP solutions, which manage – from the perspective of the technologies used and the functionality offered, to compete well against solutions from other parts of the world (e.g. LCS Noris transposed onto the Microsoft.NET platform); or else, these are systems which, thank to their lower costs are more acceptable for Czech enterprises than world-class ERP software (e.g. LCS Helios IQ). Taken from this point-of-view, domestic products may compete either with foreign products with a longstanding traditional base in the Czech Republic (like Microsoft Navision), or systems oriented on the key individual processes (e.g. Visual Enterprise, SSA MAX or SyteLine in the medium to large-scale manufacturing enterprise market segment).

Fig. 5: Number of All-in-One ERP system implementations by country-of-origin – in the SME market segment (Source: Petr Sodomka/CVIS 2005)



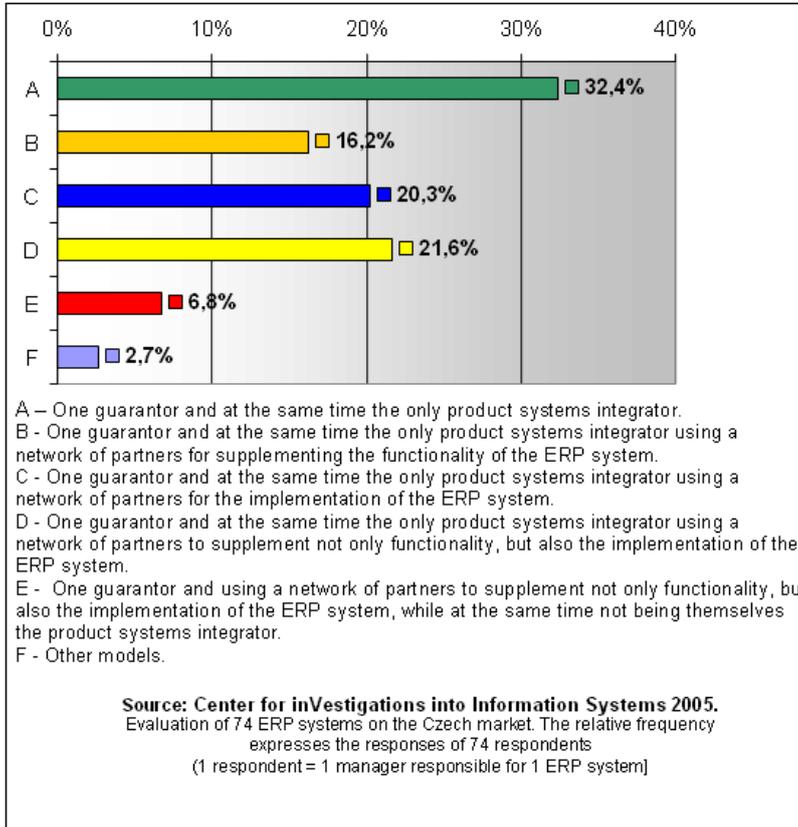
6. Customer satisfaction and the implementation of an ERP concept depends to a marked extent on the choice of commercial model of the ERP system delivered. The actual results of research into the most frequently practiced commercial models (from the direct to the indirect) are shown in Fig. 6. The characteristics of the individual models, including the evaluation of their influence on the implementation of ERP concepts have already been published in the BIZ magazine (8, 9).
7. A certain form of commercial model for deliveries of ERP systems – and in essence, the realisation of ERP concepts is represented by rents/loans in the form of ASP. Over the past five years, we have been able to follow the trend of the growing preparedness of providers for this form of providing enterprise business applications.

On the other hand however, it is possible to state that Czech enterprises (with the exception of large corporations which dispose of sophisticated IT managements, and which manage to (correctly) evaluate the effectiveness of outsourcing and to realise them in practice for the benefit of the enterprise) the demand for the outsourcing of ERP systems in the form of ASP is minimal. This is proved by the results presented in Fig. 7.

8. Realisation of ERP concepts cannot occur without so-called complementary products (i.e. database platforms, operating systems, networks, infrastructures, hardware). At the present time, this sector is dominated almost exclusively by products from world-class corporations (e.g. Oracle, Microsoft, IBM, Citrix.).
9. One of the key results of the realisation of ERP concepts is the processing of managerial information. This is one of the fundamental requirements on the functionality of ERP systems throughout all types of enterprises. The object of any analytical processing offered by the majority of ERP systems is the processing of operational data – especially from the fields of Accounting and Sales, and this is usually in the form of pre-prepared reports.

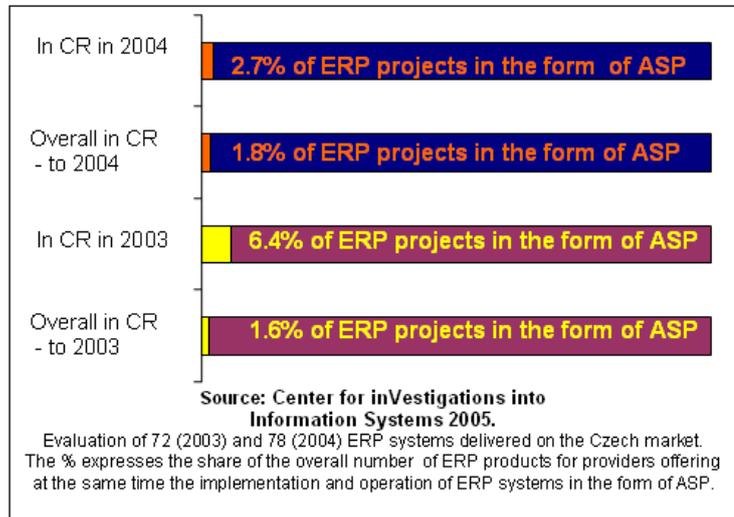
With large-scale enterprises, greater emphasis is placed on the implementation of full-value data storage facilities. For the specific needs of so-called "verticals" – like for instance Banking or Telecommunications, data storage facilities within the framework of ERP concepts represent a critical, primarily demanded functionality. Realisation of more advanced managerial concepts (e.g. BSC) within the framework of ERP concepts can be considered, at least in Czech enterprises, as being exceptional.

Fig. 6: Commercial ERP systems models delivered on the Czech market
(Source: Petr Sodomka/CVIS 2005)



10. One of the indivisible components of ERP systems is functionality in the field of workflow. Despite this fact however, we can come across insufficient cover of this field in many ERP systems, and especially in details like the management of documentation of service-related, and such like. The functionality of APS, SCM and CRM on the other hand is only implemented there where the client really needs it. It can be stated that the use of APS, SCM and CRM is a highly individual issue.

Fig. 7: Rent of ERP systems in the Czech Republic, in the form of ASP
(Source: Petr Sodomka/CVIS 2005)



4. A few words in conclusion

During the course of the past year, when intensive preparations for the first monograph to be published/issued by the Center for inVestigation into Information Systems have been going on, I have visited a large number of Czech and Slovak enterprises accompanied by my colleagues, and where we have held extensive discussions with the intent of elaborating case-studies based on the same or advisory services targeted at the selection of information systems. If, on the basis of these as well as preceding experiences, it is possible to draw any comprehensive conclusions about the realisation (implementation) of ERP concepts as a process-oriented strategy - then clearly, they would have to be the following:

The successful realisation of an ERP concept as a process-oriented strategy is the domain of those enterprises whose management is formed of educated and motivated individuals. As long as they are equipped with the requisite knowledge and experience from the fields of enterprise business systems (i.e. informatics) as well as the management of enterprises; and as long as they enjoy the support of the top management of their organisation – then they themselves, as a working team, represent a competitive advantage for their organisation. The ERP system itself represents a mere tool for the attainment of the enterprise's aims and objectives leading to the realisation of the enterprise's strategies. A variety of approaches and procedures may serve for the realisation of an ERP concept as a process-oriented strategy, and not only the implementation of the ERP system.

One of many examples which we could use in support of and to underline this statement is a comparison of the approaches to the realisation of ERP concepts in

the spheres of health care provision services, and concretely in large hospitals. The example which I use is that of the approach taken by the Institute of Clinical and Experimental Medicine (IKEM), whose IT project entitled "Zlatokop" (i.e. Gold-digger), was awarded a top prize in the Cache Innovator Competition by the IDC analytic company.

The IT department of IKEM is led by a person with extensive experience and knowledge, who has at his disposal a team of individuals with embedded hybrid careers (i.e. doctor combined with innovator-designer in combination with analytic skills). For this reason, he was able to allow himself to select a solution to their ERP concept based on the integration of enterprise applications (EAI) – including the creation of data storage facilities and a dedicated company portal which integrate a user interface for hundreds of users. This untraditional approach to the creation of an ERP concept fully supports the aims and objectives of his parent organisation – it corresponds to the requirements of all of its user groups, enables a high degree of comfort in the processing and interpretation of in-house data, does not threaten the (normal) functioning of the critical processes of the organisation, and flexibly enables the (further) development of the organisation with all of its complicated processes for the future. A not insignificant advantage of this project is represented by the significant savings on IT throughout the whole organisation.

Many large teaching hospitals in the Czech Republic take a "business as usual" approach – i.e. the implementation of a standard ERP system. Their starting conditions and "entrepreneurial" environments are easy to compare, the users have similar requirements to their colleagues in IKEM (i.e. historical information about patients, diagnoses, modern treatment methods in the world, etc.). Standard ERP systems, even if directly designed for hospitals cannot have, simply as a matter of principle, architectures able to fully support the functioning and aims and objectives of the organisation, nor to fulfil the demanding nature of the users requirements on it, and thereby aid in increasing the competitive ability of these organisations.

This example clearly demonstrates that what is substantive is not the concrete ERP solution (i.e. the software applications), but rather the implementation of an ERP concept as a process-oriented strategy, whose carriers are the designated responsible managers in an organisation. It is only then that an ERP system or any other way of covering the key enterprise business processes can contribute to any real increases in the performance and value-added of an enterprise.

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