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INFORMATION SYSTEMS MANAGEMENT IN PERSPECTIVE OF BUSINESS BENEFITS

Information Technology is an integral part of every firm, organization and different types of institutions (government, military, health and culture). In every case Information systems support variety range of business and there are totally different aims IT has to face in each situation.

To reach those goals it is necessary to make suitable choice of the best IT systems combination, the choice of level and ways of integration in that model, and than answer many many questions like which part of the combination is worth developing which one should be stop investing, when it is necessary to change background of the technology and when it is not. This is never ending decision-making process shortly called IT strategy.

Nowadays, it is obvious that without well-prepared IT strategy directed to the type, size and branch of business, it is impossible to reach main business goals and use new information technologies effectively. One of the part (tool) of the strategy is: the level of integration and the methods of estimation IT investment return, which I was considering during last conference.

This paper describes possible way of building an effective IT strategy in perspective of long-term business benefits in order to size of the firm, branch and the type of business. Firstly the general scope of this way is given and in the second part the case connected with building an appropriate IT strategy for economical High School is described as an example.

IT investments characteristic

To build an appropriate IT strategy it is important to take into consideration the classification of IT investments, which can be grouped by different criteria.

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There are given two possible ones, which seem to be significant in the process of constructing IT strategy.

Different types of IT Investments

IT investments can be divided into hardware and software as following:

Basic infrastructure like:

Local Area Network/Wide Area Network, Internet access points, speed of data transmission and others. Basic infrastructure has a huge impact on security and efficiency of IT solutions.

Office infrastructure

Office infrastructure means both hardware equipments like personal computers, printers, and office programs (office editors, e-mail exchange standards, workflow software)

Applications' infrastructure

Applications' infrastructure is a very important element of IT investment - application servers, databases, middleware layer and other technical solutions without which business software cannot work properly.

Business Applications

Nowadays no single system satisfies end users at any level of hierarchy in an organization and it is impossible to avoid using at least a few information systems in an enterprise. Which is the best combination of business applications for the firm at the moment and in perspective of long-term benefits? – This is the main question IT strategy has to answer to.

Different types of IT costs

Every type of IT investments given above consists of/can be divided by different types of costs connected with implementation, using and developing information technologies. It is important to be aware of the fact that making a choice of proper IT solution isn't the last important decision but IT strategy must also consider following kinds of costs:

Requirements' analysis

Reliable and professional requirements' analysis is essential to reduce the total cost of IT strategy implementation. Very often external consulting firm makes this analysis - on one hand it is good - it means knowledge of international specialists, on the other side - it makes our IT strategy more risky if it is unpopular branch with specific business processes.

Completing IT solutions

Basing on assumptions defined during the analysis the suitable solution can be designed.

Firstly the complete dedicated business software should be take into consideration (Oracle e-Business Suit, My SAP, IFS and so on). The final combination of information technologies can also consist of customized products if there are specific business needs that must be supported by IT.

The cost of implementation

Following the IT model that has been designed, the next significant type of cost is connected with IT model implementation. It means the total cost connected with purchasing, installation, and running both hardware and software of IT model specification. Very often the cost of implementation is a significant expense but decisions in the area should take into account not only the price and quality of components but also IT model requirements and the way of implementation which is the key factor in becoming competitive at the market.

Operating costs

All standard operating cost like administration of IT infrastructure, training for end users, short-term costs of reducing the effectiveness of employees working with new IT solutions/environment etc. should be included by IT strategy. Making decision in this area it is worth comparing inside operating cost with possible outsourcing services fee.

Support and services costs

Of course, IT solutions should work properly all the time but it is important to be prepared for additional expenses connected with unexpected problems with applications' work. IT strategy should include the emergency procedures and a budget necessary to keep IT infrastructure working all the time.

Development

Well-prepared IT strategy takes into consideration the cost connected with developing IT model. Never ending information science rapid progress makes it necessary to overview IT strategy and to adjust it to the actual technologies and business needs.

A table below contains IT investment characteristic (source: self-elaborated)

Business strategies characteristic

To better understand the process of constructing IT strategy that is given in this paper, it is necessary to explain a meaning of basic definitions connected with this issue, which are used in the next part of this paper.

Different types of business strategies

'Strategy', like many other words in Economy science has got different meanings and definitions depending on macroeconomic situation, the size of enterprise, holding position in the market, business objectives and others. Classification given below contains short description of the most frequently used ones.

Corporate strategy

Corporate strategy is an essential part of management process of every firm. Corporate strategy sets main directions for enterprise's development and includes such elements like: operating sectors, destination position in each market, desirable customer profile, final products' portfolio and designs a corporate budget.

This is the most important strategy and all other strategies in the enterprise should be founded on to the corporate strategy.

Competition strategy

This strategy aims at identification of possible ways to distance competitors. Creating this strategy it is necessary to make an analysis of strengths and weakness of firm's position at the market what can be useful in a competitive struggle. SWOT analysis is very popular in this situation.

IT Investment types:	Type of COST					
	REQUIREMENTS' ANALYSIS	COMPLETING IT SOLUTIONS	IMPLEMENTATION	OPERATING COST	SUPPORT AND SERVICES	DEVELOPMENT
BASIC INFRASTRUCTURE	What is the number and type of end-users? What is the number of transaction in the period of time?	Possible architectures of IT solution faces those requirements including: present infrastructure, Local Area Network, Wide Area Network the number of end point, the configuration of servers	Possible internet and hardware providers the cost, terms and conditions of implementation	Network administration, self-service possibilities, training program, monitoring of network	Support and service conditions, the time of reaction since the problem accrued	How far the solution is open, possibilities of developing it (adding new users, increasing data transmission)
OFFICE INFRASTRUCTURE	Is there any standards of office information exchange (e-mail standard, Workflow standard, the hierarchy of approval) How many documents are created? Is any database of those documents?	Possible standards of software (MS Office, Lotus Notes, Outlook, Workflow application, database, web mail access) and hardware (parameters of end-user station, the number and type of printers)	The time need to run the solution; and others; is it necessary to pay external firm to implement the solution or it can be implemented by self-service?	Training for end users, Implementing new standards, the policy of licenses	Contact points and necessary instruction and procedure	New version cost, when it is necessary to put it; training for users
BUSINESS APPLICATIONS	Business requirements necessary to support the core tasks in that business	The combination of ERP, CRM, SCM, BI systems, and others which are specific for the branch	Possible providers, consulting firms with business knowledge, the time of implementation, the methodology of implementation	Training programme for new users; administration cost; License policy	Support and service cost and conditions	How often new version is offered, how complicated is it to put new versions, what about modification and development necessary for future requirements
APPLICATIONS' INFRASTRUCTURE	The technical parameters necessary for BA model, connection with Basic and office infrastructure	Servers, database, middleware layer, the way of integration	Hardware provider, integrator partner outsourcing possibilities,	Administration cost, keeping qualified staff or outsourcing fee	The time of reaction, procedure of reaction	Technological development connected with changeable business requirements

Leading cost position strategy

This strategy is an example of competition strategy. This strategy determines possible ways to minimize the total operating cost what implicates the lower, competitive prices of final goods being more attractive for potential customers.

Product strategy

One of assumptions defined by corporate strategy is connected with primary products in portfolio. Developing this issue it is necessary to have a complete product strategy describing the range of product, potential customer segment, the possible life cycles of products defined in portfolio and other significant information.

Methods using in constructing business strategies

SWOT Analysis

Strengths Weaknesses Opportunities Threats – it is a very well known analysis used by managers during constructing business strategies. It lets them to estimate the strategic position at the market and possible ways of being more competitive in different operating sectors.

Benchmarking

Benchmarking is a specific kind of method of optimizing strategic business processes by comparing them to the same or similar ones in leading company.

Activity-Based Costing and Activity Base Management

Activity Based Costing and Activity Base Management can be effective tools in estimating the return of IT investment. This calculation is necessary to find which of IT solutions is the most effective one.

ABC makes possible to calculate the cost of each process and business benefits of using information solutions in context to those processes.

There are many other methods which are helpful in setting business strategies but because of limited space it is impossible to give detailed descriptions of all possibilities in this paper.

Methods described above are most significant according to possible way of constructing IT strategy which is given in this paper.

IT strategy development process.

IT strategy and corporate business strategy should be coherent across one organization. What's more the business strategy should implicate concrete directives for IT strategy like: critical sectors of activities, business goals and desired results.

This part of paper describes possible method of constructing IT strategy in an average firm to maximize benefits of using information systems in an efficient way. In the next part of the paper it is showed how the IT strategy could be used to manage information systems in longer terms.

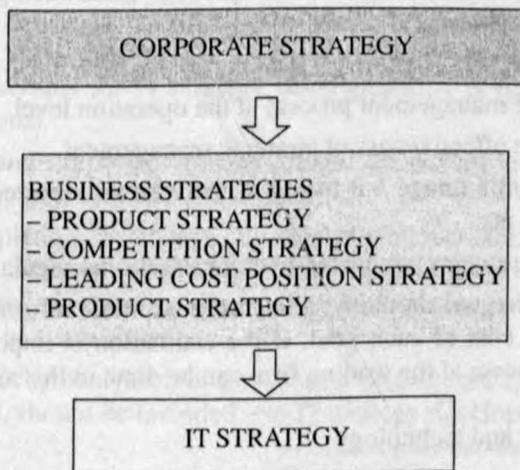


Figure 1. Business strategies' classification
source: self-elaborated

Directions of development of IT strategy

Business directives for IT strategy

The first step in constructing IT strategy is to implicate main areas of activities, which need to be supported by information systems according to corporate strategy's directives. Those directives should be a part of an official documentation called 'Business directives for IT' which becomes a base for the next step in creating IT strategy.

Apart from this it is necessary to recognize the actual level of information technologies that are used across the firm.

High-level requirements

When the document of business directives is done, high-level requirements of using business application and information technologies can be define. Those requirements should directly refer to business processes in the sector which is going to be supported by information technologies.

Strategic business targets

Then requirements should be translated into strategic business targets such as:

- Minimizing the cost of activity process
- Improving the effectiveness of the process (minimizing time needed to complete the process),
- Higher quality,
- Improving the management process at the operation level
- Improving the effectiveness of strategic management
- Improving firm's image – it means all activities connected with marketing, sales process, etc.
- General requirements connected with local/national regulations.

Every strategic goal should be given as measurable information because we must estimate the cost of each goal. If the estimation is impossible benchmarking of similar process at the leading firm can be done in this situation.

Infrastructure and technology

When high-level requirements, actual configuration of information systems and identified strategic goals are clear, it is possible to appoint directions of development for IT sector. It means to design the future configuration of applications and infrastructure which is suitable to the model.

Cost of getting strategic goals

To get strategic goals following cost should be taken into consideration: analytical work, implementation, new hardware equipments and infrastructures, cost of specialists for keeping administrating and development of systems, which are going to be implemented. This calculation makes the estimation of future benefits and strategic goals arrangement possible.

Analysis of strategic goals' profitability.

Strategic goals can be achieved by using different combinations of applications and information technologies. To choose the best one it is necessary to make a profit/cost analysis of each strategic goal in long-term perspective. There are different methods and rates that are helpful in estimating the return of investment like ROI.

Every element given above (the list of strategic goals, estimated value of profits/costs of realization of those targets, necessary infrastructure and the total, long-term costs of the combination) should be grouped in one formal document namely 'Comprehensive analysis of business strategic goals'.

Conditions

Defining directions for IT strategy development it is obligatory to follow primary assumptions:

- IT strategy and corporate strategy should be always linked – especially while strategic goals for IT are defining.
- Before completing IT strategy, the analysis of workability for each plan, according to different types of conditions should be done. Reality of the plan is necessary because non every high level requirement could be possible to realize in every situation.
- IT model security analysis like the security of data, unexpected stop in line of production, should be included into IT strategy development plan.

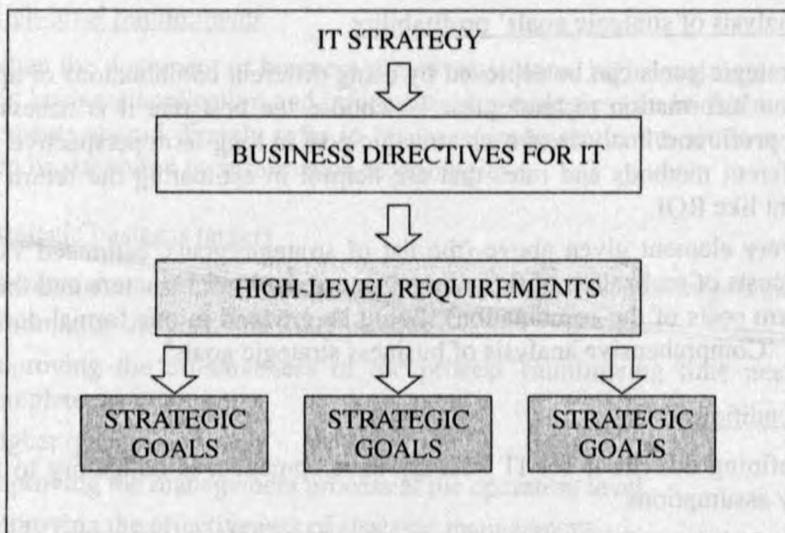


Figure 2. It strategy's development
source: self-elaborated

Creating strategic plan of IT development.

Primary assumptions for strategic plan

On the basis on clear strategic goals and profit analysis of strategic goals, the plan of implementation can be defined. Following elements should be described in the plan:

- Schedule of realization of goals taking into account the materials and resources
- Methods of realization which were made on bases of high-level requirements and actual firm's IT infrastructure
- Directives of trend of technologies, architectures and security requirements.
- Possible ways of Integration of information systems.

Strategic plan is a basic tool of IT strategy and it makes possible to manage the realization of IT strategy.

So again it is necessary the strategic plan should be a formally accepted document called 'Plan of IT strategy development'.

Global IT architecture

When the plan is ready, next step is to draw up an information systems architecture, according to following assumptions:

- Possible combinations of information systems and business architecture
- Standard of data stored by the model
- Methods of integration of information systems and necessary interfaces
- Security
- Standard environment for end users
- Technological documentation for administrators
- Requirements of IT quality standards
- Local (national and regional) specific needs.

The technological architecture should be described in 'Technical and quality standards for IT model' – an official project document.

Operatives objectives

On the base of the plan and the architecture it is possible to assign an operative task to each strategic goal according to following steps:

- Strategic goal verification
- Requirement analysis
- Profit analysis
- Work plan – operative targets should be defined as tasks in the plan of strategic goal's realization.

Operative objectives make it possible to control and manage the whole process of strategic goals realization. Those objectives should be defined clearly by documentation according to methodology accepted earlier in 'Plan of IT strategy development' document.

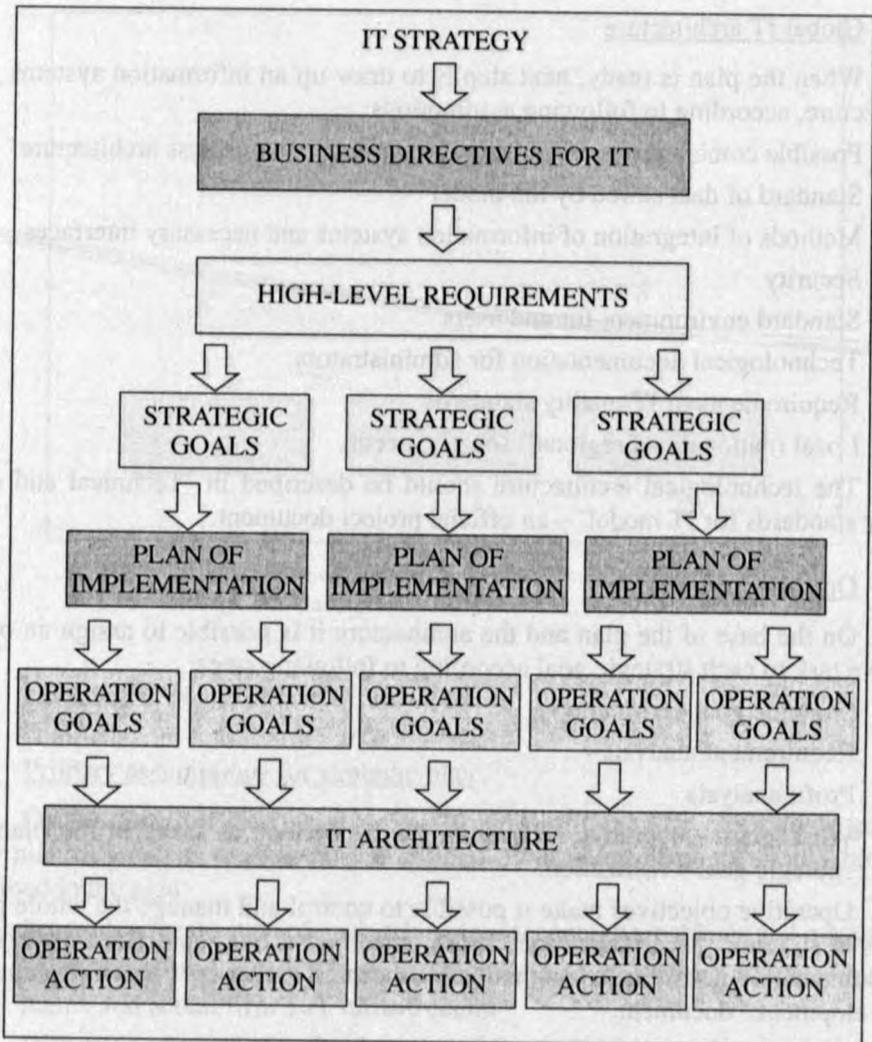


Figure 3 Strategic plan of IT development
source: self-elaborated

Effective Information Systems management strategy

It is not enough to build IT strategy. It is necessary to manage information systems' environment all the time. No IT strategy is good for years. IT strategy is based on many factors which are described in the previous section in this pa-

per. It is obvious that a change of one of that factor implicates a need of IT strategy's modification. The possible changes of the most important factors which have an influence on IT strategy is given below. To make the business more and more competitive and effective the management of information systems' environment must go on as long as the firm wants to exist at the market.

Changes at the level of business strategies

Changes at the business strategies level are mainly connected with:

- Variable operating conditions like new regulations at the local market, new competitors, new contracts of partnership etc.
- Increasing/decreasing firm's operation range
- Changes of cycle of product's life
- Modification of price/cost/competitive strategy and other significant factors.

According to changes at the business strategies level, the following modifications in IT strategy are necessary:

- Review of business directives
- Modification of high-level requirements
- Review the list of strategic goals
- According to new strategic goals it is necessary to change the technical architecture and operating tasks.

Changes at the level of operating goals. Business processes optimizing.

While IT strategy is constructed the analysis of business processes at enterprise should be done. This analysis is called the firm's potential analysis.

Operating activities must follow business processes optimizing what very often means changes at the level of operating goals. It implicates a need of review the most part of IT strategy as follow:

- Analysis of business processes and defining new operating goals
- Modification at the level of strategic goals if necessary
- Review of technical architecture according to new operating assumptions.

Of course, changes at the level of operating objectives influences IT strategies less than changes at the level of corporate strategies but business processes optimizing can be significant in distancing competitors.

Progress of information technologies.

Very often there is a need of IT strategy's modification because of technology's development. Changes at this level mean a possibility to replace old solutions with the new ones what implicates totally different operation goals and activities. It is also necessary to review the strategic goals analysis from future business benefits and possible cost points of view.

Final conclusion

In many institutions the information systems' strategy is connected with previous practice and actual needs. What's more, many decisions in this area base rather on international trends than on assumptions defined by corporate strategy. IT strategy should be determined by specifics needs defined by different business strategies which are totally different in hospital, administration or variety type of business.

The critical success factor of effective IT strategy is a strong, direct connection with the actual business strategies and never ending optimizing process up to variable market conditions.

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