Information Aspect of Human Resources Management Business Process Improvement

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Abstract: Human resources (capital) management (HRM) inside large systems is very complex and demanding, to achieve successful accomplishment high quality information support is necessary. There are many cases where human resources management process is not conducted in a satisfactory way. Key decisions usually come late, very often because of impossibility to consider a problem in its entirety. The cause of it usually lies in weakness and understatement of the human resources management itself and in this connection data management is not given adequate consideration. Data originating from inside and outside sources within IS are not integrated in a way which will provide an optimal use. In this connection, this paper examines possibilities to improve the entire human resources management process through the integration of respective data. Data warehousing (DW) possibilities and position within the integral business intelligence (BI) concept are noted as a first step towards its realization. In Chapter 1 and 2 necessity to improve and promote permanently the quality of human resources management process is considered; the main features of the process are given as well. Chapter 3 deals with Business Process Improvement (BPI) as a systematic approach with a view to achieve significant business process change; its connection with data aspect of IS is given too. According to the research of this paper, HRM BPI is achieved by the data integration within existing information system. DW model intended for HRM has been elaborated as a solution which will improve the process itself. The position and the role of DW within entire BI organization concept has been established as well. Chapter 5 explains the benefits achieved by this research.

Key words: business intelligence, business process improvement, data warehousing, human resources management, information management

1. INTRODUCTION

Human resources management is the basis to obtain comparative advantages and integral efficiency since human potentials are the most important resources nowadays. Successful functioning and realization of aims defined in the chosen strategy, within functionally oriented and hierarchically structured organizational system it is necessary to upgrade human resources management processes. This can be obtained by improvement of the already existing and development of new processes and procedures which will result in the integration of the information system data. According to CIO view [4], business process improvement is first of top 10 business priorities in 2005. Information system which usually supports human resources management is not completely satisfying, since the data within it are not integrated on the data model level and because of inherited modularity they are disunited. The aforesaid disunity is manifested through inadequate (insufficient) connection between information subsystems within IS HRM. Possibility to make complex and user defined data analyses on the basis of time dimension which is indispensable in the decision making process are insufficient too. Obtained desired improved process should render possible the integration with other functional areas and processes within an organization. They can also be improved through other different approaches (neither necessarily through data integration, nor by elimination of it). Integration within organization system will be conducted on the basis of chosen and accepted strategy, in conformity with defined priorities, disposed human potentials, organizational procedures and chosen technology. Functional logics should be defined in order to satisfy conceptual unity of the improved process which is the first element of the IS unity. Improved process must be open and connecting point must be provided for.

2. HUMAN RESOURCES MANAGEMENT

2.1. HRM GOALS

People, human resources, human resources management are the key words which are dominant preoccupation of modern managers and organizations. Human resources management is oriented towards successful fulfillment of the organization goals and objectives. Its specific goals must be compatible with business goals and objectives. Therefore associated goals can be divided into three basic groups: business and economic, social, goals of flexibility and permanent change as well. Immediate business goal is to ensure: appropriate number of employees with adequate qualification in good time and place. Their potentials achieve organization goals and to increase organization competitiveness and success must be turned to the best account. HRM social goals are identified through fulfillment of needs, expectations and interests of the employees, improvement of their socioeconomic status, use and development of individual possibilities, insuring permanent full employment and the improvement of working life quality. Key assumptions needed for development and existence of the organizations refer to continuous and prompt adjustments to the outside changes. People are the resource of flexibility and adaptability. In this connection, HRM goals and objectives involve the creation and maintenance of flexible and adaptable potential of all employees, resistance to changes should be reduced. Changes should be viewed as a way of life and complete human potential should be sensitive to quantitative, qualitative and structural changes.

2.2. HUMAN RESOURCES MANAGEMENT PROCESS

Human potentials include knowledge, skills, abilities, creative possibilities, motivation and loyalty at disposal to an organization. That is intellectual and mental energy which an organization can engage to achieve goals and business development. HRM include a lot of interconnected processes, activities, and tasks by means of which adequate number and structure of employees, their knowledge, skills, interests, motivation necessary to realize actual, developmental and strategic goals will be insured. HRM include the following basic processes:

- Strategic HRM
- Necessary number and structure of employees
- Analyses and shaping of jobs and posts
- Recruitment, installation and disposition of personnel
- Tracking and assessment of efficiency
- Motivation and awarding
- Education and development of employees
- Creation of adequate organization climate and culture
- Social and health protection
- Employment
- Different services to employees

Each of the above mentioned processes includes various and specific activities, professional tasks and duties. As for management and organization managers, these processes and duties correspond to the key questions connected to the business and development problems, as follows:

- Vision of future business and staff planned to be engaged in business development
- Work and business demands at present and in future
- Staff needed for present and future business needs
- HRM strategy which will result in such personnel
- Recruitment of best experts and talents
- Keeping those who are the best and the most qualified, sacking those who are not competent

- Further development of employees' potentials
- Differentiation and awarding of the best employees
- Provide for necessary knowledge and skills of all employees
- Provide for permanent development of employees' proficiency and potentials

For all above mentioned processes, activities and accomplishments, it will be necessary to provide information system support with numerous entities and connections so that big quantities of differently organized data can be stored and processed. Since the data are originating from different resources they should be integrated-consistence in content, titles and formats should be ensured. Data must contain the time dimension as well, during the process data should be snapshot during regular periods of time.

3. BUSINESS PROCESS IMPROVEMENT

More than ever, business process improvement/reengineering (BPI/BPR) is gaining recognition as a critical success factor in sustaining the growth and profitability of businesses [12]. BPI is a systematic approach to help any organization make significant changes in the way it does business [10]. It's about the redesign of business processes and the associated systems and organizational structures to achieve an improvement in business performance. The organization may be a for-profit business, a non-profit organization, a government agency, or any other ongoing concern. BPI works by:

- Defining what the organization's strategic goals and purposes are
- Determining what the organization's customers (or stakeholders) are
- Aligning the business processes to meet the customer's requirements.

The goal of BPI is a radical change in the performance of an organization, rather than a series of incremental changes. This radical model was popularized by Michael Hammer and James Champy in [5]. They stated that the process was not meant to impose trivial changes, (e. g. 10 or 20 percent improvements or cost reductions), but was meant to be revolutionary. Reengineering has earned bad reputation due to the fact that such projects have often resulted in massive layoffs. In spite of the hype surrounding its introduction, reengineering has not lived up to its expectations [10]. The main reasons seem to be that:

- reengineering assumes that the factor that limits organization's performance is the ineffectiveness of its processes (which may or may not be true) and offers no means of validating that assumption
- reengineering assumes the need to start the process of performance improvement with a "clean slate", i.e. totally disregard the status quo
- reengineering does not provide an effective way to focus improvement efforts on the organization's constraint.

Other organizations did not make radical changes in their business processes, did not make significant gains, and wrote the process off as a failure. Yet others have found that BPI is a valuable tool in a process of gradual change to a business. An organization could be viewed as a network of people sharing information through cross-functional processes to achieve predictable and desirable results (profits and growth). The goal is to use this fundamental notion to design and build systems that would leverage the organization's ability to manage information more effectively and efficiency. There's a big opportunity and impact this knowledge has when applied to the organization as a whole within a Business Process Improvement Methodology [11].

3.1. PRINCIPLES OF BPI

Most BPI methods and techniques grew out of the Total Quality Management School of thinking [11]. This is evidenced by the tools and techniques these methodologies utilize. Many have their roots in organizational behavior and focus more on the "Touchy Feely" and "Political Correctness" aspects of change than on the fundamental need of the organization to adopt pragmatic and systematic methods for improving and sustaining itself. In [10] eight principles of Business Process Improvement are given:

- **Base activities around outcomes, not routines:** BPI is organized around outcomes, not the specific tasks required to reach the outcome. Organizations using BPI seek to eliminate the emphasis on routine that may not work well in an ever-changing political, business or legal climate.
- Focus on the customer: Many organizations fail to do this. Routine sets in. Resources within the organization start to be allocated based on political needs rather than business or policy needs. Meanwhile, customer needs may have changed to the point that the organization may no longer effectively serve the customer and faces economic pressure or political pressure.
- **Process first, not automation first:** Although BPI may use automated planning tools such as enterprise resource planning, automation or information processing is not meant to be a substitute for BPI. An automated but inefficient system does not adequately meet customer requirements.
- **Benchmark regularly:** An organization using BPI must continually and frequently determine if the costs of performing a business process outweigh the benefits. Therefore this organization must establish **benchmarks**, or a set of standards, against which the process must be measured. The benchmarks themselves must be quantifiable, attainable, and realistic.
- Establish who owns a business process: Specific people, the *process owners*, must be placed in charge of a business process, be responsible for the performance and changes in the process, and be responsible for the success or failure of a process. Without personal responsibility, the process may fail.
- **Build control points into a process:** There should be frequent points where the process owners and customers/stakeholders decide if the process is meeting current benchmarks and what they should do with the process. This may include halting the process if it fails to meet realistic benchmarks.
- **Standardize similar processes:** Many organizations rely on an ad hoc approach to business processes. They make them up as they go along and change them without deliberate planning. A standardized system of preparing processes saves time, effort, staff hours, and money.
- Make changes now: The change process should be done repeatedly, not merely once. Waiting for a perfect solution would mean no solution.

3.2. DATA AND INFORMATION PROCESSING IN BPI IMPLEMENTATION

Effective BPI relies on working in partnership with the people who own and use the process. This approach is adopted because it is the owners and users of the process who have detailed knowledge about the process – how it works and how it can be improved. Carrying out BPI is a project, so all principles of project management apply. The first step in BPI is to define the organization's mission, existing structure and processes (*AS-IS*). Then the BPI process owners should determine what outcomes would add value to the organization's mission and objectives (*TO-BE*). Once the outcomes are determined, the organization's work force needs to be reshaped to meet the new missions and objectives, and a series of benchmarks, including cost metrics, should be put into place. It is during these latter steps that much of the resistance to BPI becomes apparent. Although information processing is not meant to be the whole of BPI, it is a significant part of BPI. Successful BPI programs follow guidelines similar to these:

- Do not think of existing procedures when designing new processes
- Put information processing power into the real work that produces the information rather than peripheral processes
- Move towards organization-wide data definitions
- Capture information once, at the source, without duplicating data.

Most resistance to BPI comes from within an organization. Managers do not wish to change existing structures; they reached their positions within the current system. The labor force may resist BPI because of fears of layoffs; however, an organization using BPI on a regular basis, argue many proponents, will already have the proper work force to meet existing business challenges.

Some organizations have implemented BPI on a smaller scale and report success. To do so, they learned the following lessons [10]:

- Start with a small process that can be completed in a short time frame
- Set clear timelines
- Do not spread resources thinly and focus on the short term payoff
- Management and primary stakeholders must be involved, or else even a limited implementation will fail.

4. HUMAN RESOURCES INFORMATION MANAGEMENT PROCESS

Strategy should enable the company realize broader enterprise goals, one of which is to improve process automation by converting some manual processes to automated processes [6].

An analysis of the Hackett Group [7] data shows that three strategies are used to deliver IT solutions. Technology-only solutions are easier to implement but fail to consider all the effects technology has on the business process. Strategies include the following:

- A point solution approach Technology is deployed to solve a portion of a business process issue. Variables related to human factors (internal and external human and technological interactions), the impact of the point solution on the entire business process, and how the enterprise measures the process improvements and accesses key data to facilitate decision making are not considered.
- A multipoint or process solutions deployment Technology is used to address the key areas of processes, people and business process information (measuring process improvement and gaining access to data). Each of these interactions is addressed independently. Interaction among the variables is not considered.
- A multi-variant approach Solutions delivery simultaneously addresses four key areas: technology, processes, people and business process information. It addresses each area independently and also addresses how each area affects others.

4.1. DW PLACE AND ROLE FOR BPI THROUGH INFORMATION SYSTEMS INTEGRATION

The rub in selecting the best tools and techniques for BPI approach is in the lack of the proper evaluation and selection criteria upon which to base decisions needed. Knowledge workers (the people who actually perform operational-level work) hold the key to discovering ways to improve cross-functional business processes. However, first they must be briefed on the value gaps that management needs to close. It is only in this context that process mapping has any value in BPI initiatives. BPI methods must provide comprehensive techniques for facilitating knowledge workers in context to the value gaps defined in order to identify and define the improvement opportunities. Furthermore, the techniques used should be facilitator independent as to form and outcomes achieved [12]. Among other things DW is needed because of insufficient data connection of transaction system information subsystems. This is manifested in the existence of a number of independently developed and nonintegrated application systems with data bases in different parts of an organization. Such nonintegrated systems are the result of uncontrolled decentralization and redundancy. Even if there is an integrated transaction information system, its data model doesn't satisfy newly risen analytic needs, especially when the quantity of data is extremely big. Improvement of existing transaction system by eliminating weaknesses of data model and application system usually provokes notable costs. It includes big organizational effort and intervention into program code; exchange of the existing procedures and the execution of the new ones, additional burden for the system users because of system testing and development etc.

Even when all necessary upgrades have been successfully performed, such information system supports only processes on operational level; it remains inadaptable for management and decision making support. In the aforesaid case, where data and, consequently, information subsystems processes are not integrated, DW can assume an integration role, since DW makes a new model of higher level. In this way the existing data of transaction system will be cleansed and used in a new way, with a new quality. They will be described in detail and enriched with content from outside data bases with a view to analysis and decision making HRM processes. Data modeled in a new way are

integrated, so they become a lever which will advance complex HRM processes; in focus are people, care about their professional development, and their use within organization.

4.2. DW REQUIREMENTS AND LOGICAL MODEL

Requirements of Data Warehouse, as given in [8], are:

- To make an organization 's information easily accessible
- To present the organization's information consistently
- To be adaptive and resilient to change
- To be secure bastion that protects our information assets
- To serve as the foundation for improved decision making
- The Business Community must accept the Data Warehouse if it is to be deemed successful.

To accelerate decision making process on the basis of existing transaction systems, logic DW model will be created. DW creation within this work is viewed as a way to achieve HRM BPI by information system data integration, within functionally oriented hierarchic system. HRM processes are supported by star-like data structure-fact tables with associated dimensions on the logic model level. Survey by which an employee is tracked in a specific period of time explains the role/position for which the employee is being prepared within department/section/division, and/or project, the name of institution and type of training he attended, knowledge level he obtained, costs originating from the training, employee's commitments towards organization etc. Big systems HRM process must be permanently served with data concerning mentioned and similar events within organization to avoid that an employee in whom notable sum of money has been invested is not disposed in the optimal way. Business phenomenon described by all dimensions i.e. model parameters total costs per employee is calculated for a specific period of time. Combined with parameter Performance, ratio between work contribution and respective costs will be defined as well. Tracking of such and similar phenomena and successful management have far reaching consequences for the success of an organization. It is directly connected with future investments into employees' training, better efficiency, satisfaction and motivation of employees and their wish to stay in the system. Depending on the number of phenomena which should be tracked, integrated DW model can contain more star-like structures; see Picture 1 for previously described structure.



Picture 1: Data Warehouse Logical Model Creation for HRM Process Improvement

4.3. BI INITIATIVES FOR FURTHER BPI THROUGH IS DEVELEPOMENT

Data integration technologies come in a variety of forms. Each has different characteristics, uses and design patterns that it commonly supports. Sorting through the available options is not a simplistic task because there is overlap in functionality. Vendor marketing and buyer misconceptions may add further confusion, often leading organizations to select inappropriate tools and limiting the success in their deployment. Data integration technologies commonly found in large enterprises include among others, the following [2]:

- Extraction, transformation and loading (ETL) tools Support the acquisition and integration of data from multiple source databases, and the ability to change the syntax and semantics of that data, and then deliver it to one or more target databases. ETL tools typically support the movement of data for batch-oriented data integration processes, often in the context of building an integrated data structure such as a data warehouse or data marts.
- **Integration brokers** Commonly applied to problems of near-real-time application-level integration, integration brokers are increasingly considered for solving data integration problems as well. These technologies typically incorporate adapter technology to connect to a variety of application and database types, and the ability to conditionally route transactions according to business rules and transport transactions from source to target with low latency. Integration brokers often form the core of an enterprise's application integration architecture.

DW creation makes a part of infrastructure needed for development of the integral BI concept of HRM process. Further improvement of HRM process, by development of support information system, increases gradually the importance and the force of information system for HRM processes in everyday business. That is a complex procedure which ultimately results in the creation of new HRM sub-processes and produced data will be used for further increase of business effectiveness and efficiency. Further investment into knowledge, employees and equipment will lead to the creation of integral DW on the basis of overall transaction information systems. In this way integral DW will become a part of the basis for the development of functional, organizational and business levels of BI systems. A BI framework enables enterprises to align their various BI initiatives and helps them to determine the right ROI [1]. Enterprises need a BI framework to align their BI initiatives to achieve an optimal result.

The framework suggests that enterprises align their BI initiatives on four levels [1]. Each of the layers affects the others, and maximum benefit is only achieved if enterprises understand how the layers work together. Just to be complete, the framework also addresses a transactional layer; however, as this is not part of BI, it will not be discussed in detail. Layers have a meaningful return only if viewed in combination with the other layers. It is of little use to have an infrastructure if there is no BI functionality that uses it. And it is of no use to apply BI in a way that doesn't fit the organizational culture. It is crucial for BI to have an infrastructure layer in which the data is collected, integrated and generically made accessible [1]. Optimally, this is done by a data warehouse fed by an extraction, transformation and loading (ETL) tool, but ETL tools are still only used in a minority of cases.

A data warehouse is not the only possible component of the infrastructure layer. To enable a more real-time approach to corporate performance - a process called "business activity monitoring" (BAM) - enterprise applications integration processes become involved, on top of transactional systems. To deploy BAM, there may be a need for an operational data store (ODS), possibly linked to the enterprise's workflow structures. These structures become increasingly connected. In many cases, the ODS can function as a source for the data warehouse, so it is not necessary to go back to the source systems. In its turn, the data warehouse provides relatively stable analytic context to real-time indicators in BAM, providing a frame of reference. The ROI of the infrastructure is in efficiency and flexibility. The infrastructure generically enables other applications, provides economies of scale for support costs and systems management, and ensures better-quality operations. Aiming at a tangible business result - currently a popular approach - usually leads to creating sets of data marts, not a generic infrastructure.

5. CONCLUSION

Thanks to the presented HRM BPI solution model, which includes development and implementation of data integration process through DW creation, initial HRM process is improved. On the other hand, presented solution model render possible development of the integral DW concept on the organizational system level, through the integration of outside and inside data and other important processes. Such a warehouse can be implemented into integral BI concept and further developed. With such an approach to HRM BPI, through creation and usage of DW, intermediary connection between information subsystems of the integral IS HRM is obtained: 1. Connection through dataformerly unconnected data are aggregated and enriched by new dimensions and attributes. 2. Connection through management-the users, on the basis of their position within organization and newly obtained qualitative data level within DW, are given new roles and new authorizations for data handling and data management.

By means of the aforesaid connections, processes leading to an important process data integration (such as HRM) improve it at the same time. Advantages obtained through this research are reflected through the following facts: 1. In complex organizations, functionally oriented and hierarchically structured, improvement of all processes can be hardly achieved by data integration of all business functions. 2. On the other hand, integral HRM process, because of its importance and complexity, should be improved in the acceptable period of time (delay in decision making should be reduced as much as possible). This can be achieved through the DW creation as a part of BI infrastructure. 3. Thus improved HRM process, by means of data model, remains open for further integration with other processes and organization systems, in conformity with defined strategy. Such approach results in human resources management which is improved through its information system data integration by DW creation for the integral HRM support. Proposed business driven and data structured solution model for business process improvement can be used and applied in other functional areas and processes, with necessary modifications depending on the particular case.

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