



## EMSYS - Human Resources and Payroll Management Integrated Information System

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This paper presents an overview of a new integrated information system for the management of large organizations as universities, dealing with payroll and human resources management (EMSYS HR & Payroll). It is designed for specialized units or complex profile organizations, including group architecture. In particular here is presented the implementation in University Politehnica of Bucharest. Updated legislation and economic-financial practices specific to the economic/academic environments are implemented. The system offers users multiple tools to design, configure and monitor payroll and human resources processes to insure state-of-art management. Architecture and design offer a strong, flexible and easy configurable system at user's level, adapting permanently to organization's dynamic, business environment and legislation. EMSYS HR & Payroll is implemented for most difficult organizational and management models for Human Resources management. The main objectives are: it insures the development of human potential in order to optimize the professional performances, by using the most appropriate methods and labor means; set up of long and middle term strategic objectives, aiming to plan and organize human resources, attracting, obtaining and withholding workforce in organization, creating proper labor conditions, realizing job-employee accordance. Some functions implemented in the system allow setting up tactical-operational objectives, for daily activities. It provides functions to reward employees: job evaluation, performances evaluation, bonuses, appropriate benefits package, optimizing costs with human resources.

The functions implemented in this system ensure strong tools to design and configure requests specific to organization, flexible coding/recoding system such as any definition can be changed in any moment without perturbing the program. Strong tools protect personal data, creating a confidential environment between the factors involved in human resources and payroll management. All information related to employees or applicants are dynamically recorded. Specific functions address training planning and monitoring, career's management and top of career. The archives of employee's information, payroll elements in net or gross amount, in any currency, at any exchange are well designed. There are functions related to payment rates: each employee can be paid in any day with another salary, hour/employee reimbursement based on a cost center; hour/employee reimbursement on order, any hour/employee can be differently paid on diverse criteria/ algorithms, automatic highlight of payroll elements, associated taxes and holdings on cost centers, orders, employees. Tools are provided for the configuration by the user of the changes imposed by the human resources and payroll model of the company. Reporting activities can be realized in any currency, at any exchange; design and configure

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Taxes/Contributions. Special tools are provided to design human resources and payroll documents, to generate final deliverables for payments approval, to generate statistic reports regarding unity/employee. Exchange of data with other systems is considered by strong Export/Import. Advanced integration with other information systems is given for: EMSYS Financial and Banking Systems.

## 1. Technical Architecture

The technical architecture of hardware/software system was such created to be safe while functioning by: insuring tolerance to incidents, auto-recovery instruments for the database, treating processes in transactional regime (“all or nothing”), treating users’ errors and events once with data introduction. The application is such structured on four levels: database server, web server, application server and “thin” client (browser).

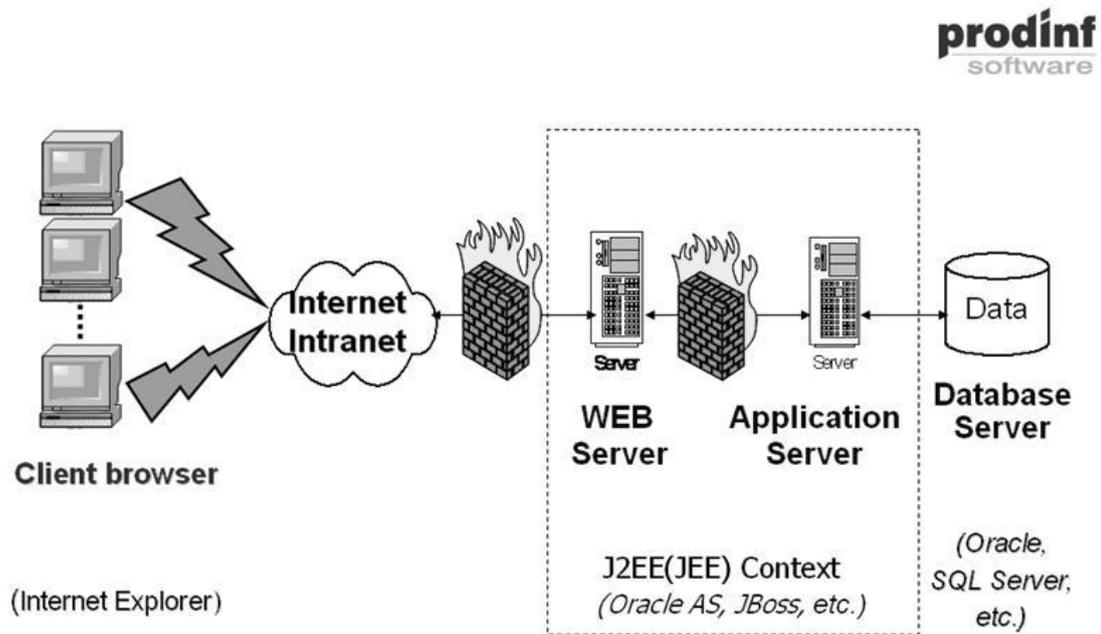


Figure 1: The technical architecture of software integrated system

In case the connection between the client and the application server is interrupted and then restored, the transaction can be continued from the situation it was interrupted.

Data security is insured at many levels: network, communications, database and by own application tools. The system works in real-time: no additional manufacturing of data are done. Once the information is validated by the user, this one is transmitted by internal mechanisms in all components of the system where it has impact.

The access to information can be configured at different levels: module (acquisitions, inventory, reports), function (processing purchase requests, offers, contracts, purchase orders, receiving documents, suppliers invoices, inventory issues, cassations, material transfers), applicant, expert budget-administrator, accountant, procurement responsible. The access to data can be integral (visualizing and/or updating) or restricted (only visualizing). Reports can be extracted on different shapes: PDF, EXCEL, on screen or in text files. Mechanisms for monitoring user actions and history reporting of the realized transactions are also implemented.

## 2. Conceptual Model and Functional Architecture

The complex activity with a strong specific character within the University Politehnica of Bucharest imposed the design, modeling and implementation of an Information System for the management of

the human resources and the calculation of salaries. This system should be in agreement with legislation, the collective labor agreement and other regulations, internal rules, as well as accepted practices. The system integrates the staff aspects in the planning system of the financial, material and human resources.

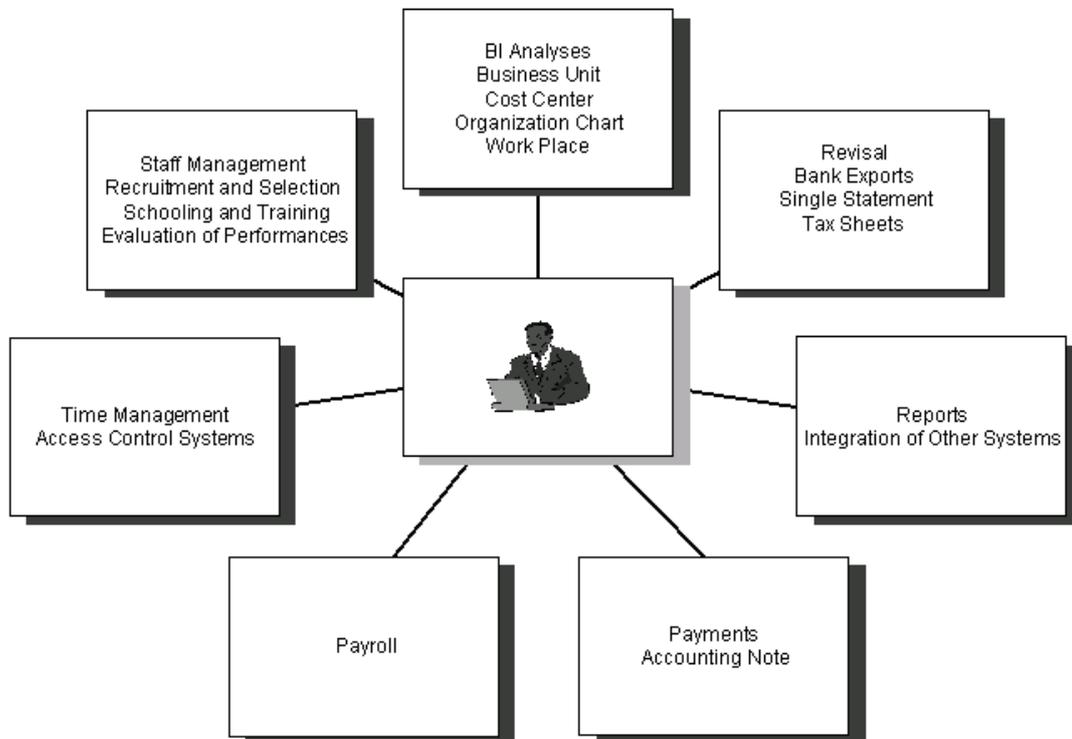


Figure 2: The Functional Architecture of EMSYS HR & Payroll

The functionalities regarding the Human Resources and Payroll ensure efficient employees management. This is necessary because many times the cost generated by the employees represents the greatest cost of the organization.

A good management of the human resources means capabilities of employment, motivation and maintenance of special employees, it means a correct and on time information circulation. According to activity analysis of the existent information system, there has been identified and evaluated the current practices to comply with the actual and perspective information system needs. The suggested solutions to improve them have been identified by requests and restrictions to realize an effective information system.

The purpose of this analysis and mapping, the requests on the Information System for the human resources management and payroll calculation have been finalized by creating a balance between the necessary of information and the effort of data collection.

The efficiency elements have set a certain report between the requests for the Information System regarding the human resources management and the effort to obtain information. Therefore, the tolerant quality of such a system is given by the specific objectives/requests and the users' access rights. The possibilities of the Information System for the human resources management and payroll calculation are provided by the quality and quantity of data that are inserted in such a system. To obtain detailed analysis, we need corresponding detailed data from the entry phase that assume a greater effort compared with the benefit brought by the data aggregation. Therefore, we need to find a balance between the management requests and the data supply in order to have maximum information with minimum effort. There is a series of requests, at subunits level, that derive from the specific

objectives, but one of the major requests of implementing the Information System for the human resources management and payroll calculation is connected with the financial and economic activities of the University.

The first to approach this system was at the Human Resources Services level followed by the Financial Service, the latter one representing, by extension, a major objective for the costs, funds and financing sources management.

Due to the Romanian legislative and economic environment, that is in a continuous change, considering as well university autonomy, the payroll calculation manner and the reporting have gone through internal changes, but also through external relations changes with other systems. The improvement of an informational system must take into account the performances of an Information System, that must be flexible from the point of view of the architectural request of the institution organization but, in the same time, it must restrict the information circulation in agreement with University access and confidentiality policy. Taking into account the future possible changes, the information system has a higher degree of integration under the following aspects:

- internal integration, by assuring the system's functional modules mapped on the internal organizational structures;
- external integration, by assuring the connections with other systems.

The information system has to be configurable, with maximum flexibility, namely to be adapted with minimum effort at the new legislation requests and to university management system. Following the management necessity at different levels to have a wider area to cover the existent informational system with an information system to offer necessary information to base decisions on different organizational hierarchies, it means that the information system has to take into account the way and place to collect information, the way of its aggregation/synthesis, to assist decision-making system under different management styles present on its different levels.

Therefore, the information system needs to supply information in real time and situations by order, giving the possibility to build new reports in order to describe the actual status and the evolution in time of the human resources, of costs, of distribution degree of funds, corresponding to the financing sources etc., needs to ensure information confidentiality in terms of sharing the available data.

## **2.1 The management of human resources**

The main processes that the management of the human resources covers are: staff management, the evaluation and professional development, the career pursuit, the evaluation of the performances and the rewards management.

The first stage of the system's definition is the creation of the organizational structures and of the staff politics from the University. Modeling the organizational structures implied the definition of graphics variants, with the possibility to make sceneries concerning the organizational structures simulated by control of the budgets regarding the human resources and the costs with human resources. One can see in the graphic the faculties, departments, research centers and functional areas of the University. For an easy approach of the graphic by responsible and for identifying each employee on organizational structure it had been implemented a graphic representation in the graphic tree structure. The realized modeling had as objective to determine the costs on each faculty, specialization, study level, discipline, up to equivalent student level where the costs with human resources have the greatest influence; it is on this modeling that the quality services provided by the University to the students depend on. In this way the system allows the necessary information for planning the didactic personnel having as target the quality growth of the academic activities. Among other major activities in University one can notice other interesting activities: research, production, social, administrative, economic, cultural, sports activities. All these activities are supported by human resources and it was a challenge to establish the costs and to measure the efficiency by the further effects generated by these activities. For this purpose there have been modeled the financing sources, modeling that responds to the budgetary report as state institution but also to the Universities and faculties management for taking the best decisions regarding the activities development.

A personnel unique base with information regarding the candidates and the employees according to the interest level has been made. The information is relatively grouped at interest level, as: data

regarding person identification, domicile information, professional experience, social status, family data, known foreign languages, military status and professional activity history.

The component for the personnel evaluation and profession improvement approaches the evaluation criteria management according to the position inside the organization, evaluation sheets, and session's evaluation hierarchy according to the chart and data confidentiality regarding the evaluations.

Each employee is tested by many evaluators inside an evaluation session and the results are centralized on each employee. The evaluation and training process is correlated with the carrier plans for each employee, helping them in their career. The evaluations' result represents a criterion of giving the reward packages, money or of any other nature.

## **2.2 Time Management**

There have been implemented a worked and un-worked time management system at employee level that correlates the worked hours and the payroll rights for employees who work in many departments in the same month and on different work programs, in cost centers or different financing sources with salaries or increments according to the importance of the occupied job.

## **2.3 Payroll**

As far as it concerns the functionalities for Payroll, these ones allow the adapting to legal and collective labor contract changes from the budgetary payroll domain without development and implementation efforts, based on functionalities configurations and on keeping history. An employee can be paid each day with a different salary; it can be settled the hour/employee on a cost center/financing source, on order, each hour/employee can be differently paid according to different criteria/algorithms, by automatically highlighting the payroll elements, associates taxes and deductions on cost centers/financing sources, orders, employee. Payroll costs on cost centers, financing sources, budgetary items are automatically generated in accounting by realizing the transformations of the organizational structures in analysis dimensions for financial management: cost centers, financing sources, budgetary items, funds, business unit. This thing allows the correlation with the budgets system of the Universities and with the performances management system.

## **2.4 Integration in the informatics system regarding the economic-financial resources management**

A uniform information system for all its structures, based on harmonizing the present legislation, facilitates the internal control and simplifies the external audit, creates corresponding conditions to increase the quality of the management act. An integrated information application that offers a set of instruments to assure the necessary information to base the decisions on competence levels, will meet the needs of a uniform system that should correspond to the organization's actual structures and represent a management and communication instrument inside the system and with the external environment adapted to the objectives of each organizational structure. The instruments for the activity management on faculties, departments, compartments, activities, at the level of the entire organization will be supplied by the system with: Ledgers, Budgetary reports, Indicators, ABC Analysis, Management based on status information, Management based on balance, Management based on statistic data regarding the personnel and the afferent expenses, payroll funds, Management based on economic-financial reports, Management based on rules and knowledge, Cost analysis on interest centers (for instance costs with base salaries, increments, management allocations, etc.).

## **2.5 Funds management for the human resources expenses based on financing sources**

Inserting data only one time and from all points of view assures in real time the information necessary for the good management of the funds, the profitability and the effective cost of the structures that generate costs with the personnel until activity, financing source, faculty, department, research contract, etc.

The information in the system represents a basis for the expenses forecast and budgets background, but also for management and funds pursuit allocated on legal destinations, in real time for all organizational structures.

### 3. Conclusions

Once with the implementation of EMSYS HR & Payroll, University POLITEHNICA of Bucharest has: an integrated management system for the activity management of a university, in order to assure the information aggregation in a unique, integrated platform; a new management model for the university resources planning; the approach to a European model of management, organization and university management; integrated computerized processes from the school domain and internal management, logistics assurance by proper infrastructure of the management processes operationally adapted at the targeted units (faculties, departments), namely the assurance of the decisional support for the academic and financial management.

The development and implementation of a new management system, where the separate functions are integrated approached will bring economy of resources. Functioning in Internet brings to costs reduction with the assistance services, by providing assistance on the Internet, in terms of highly security conditions; Opening new work stations can be achieved with no cost, being possible only by the simple connection of the users to an Internet address.

*Full solution in real time* (not to be confused with interconnected modules) – once the information is brought in the system and validates by user it is available in all modules of the system. It can be viewed in reports on the existent functions or processed by user by generating reports, patterns through the system's own instruments, including processing by SQL92, communication growth degree at level organization, and real time operational controls.

The university is encouraged to apply standards for information processing to assure the activities and decisions efficiency. It provides proofs for certifying the quality of the professional practices in the decision domain assistance.

Development of the social dialogue between producers (university's personnel) and information users (students). There is also realized an information transparency to the social partners (for instance, companies that request information on students in order to be employed, they have the advantage of obtaining real time information).

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