THE ANALYSIS ON HUMAN RESOURCES BY MEANS OF BI TYPE SOLUTIONS

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Abstract: Considering the demands imposed by the knowledge society, each organization strives to become an intelligent organization and, by the means of new and innovative Business Intelligence (BI) strategy, to gain a market competition advantage. The new BI era integrates information into the decision process through the means of decision services, relates business processes to business rules that may be changed at any time, and integrates BI benefits to capabilities provided by teamwork, cooperation, and business process management. In this article, I will present a BI solution, implemented through QlikView Application, thanks to which it is possible to analyze the employee expenses.

Introduction

The demand for dynamic multidimensional systems used to support the intelligent and predictive decision making processes, has determined the development of the systems of BI type. These systems become more and more complex, being able of a multidimensional analysis of data and display real abilities of statistics and predictive analysis in order to serve much more to the decision- assisted systems.

Business intelligence represents the assembly of the activities of researching, collecting, treating and transmitting useful information to the economic agents, with a view to get competitive advantages, by its exploitation in a defensive or/and offensive way. The BI applications of assisted decisions facilitate a great number of activities, including the multidimensional analysis, data mining, the predictable capacity, the business analysis, the inquiry, reporting and graphics designing facilities, the geo-space analysis, the knowledge management etc.

More and more companies begin to use the BI systems. That is why, these systems become more and more excellence. Under such circumstances, a company can never hold competitive advantage performing the same activities that another company performs as well.

The BI concept represents an architecture and a collection of applications and integrated operative databases, as well as of systems based on decision assistance that provide to the business community easy access to the data on the respective business. The BI concept represents a series of marketing techniques and analyses which can be fulfilled with the help of special software. By means of this system, the experts analyze the internal data of a company. The BI concept focuses on the interdepartmental

activities of a company, the analysis of material and informational flows as well as the improvement strategies of the activities inside of the company.

Regarding the usable management tools, the BI solution fall into two categories:

1. Dynamic Reporting Solutions. Better known as OLAP solutions (OnLine Analytical Processes), the solutions of dynamic reporting enable the non-IT users to access interactively, coherently and synthetically complex structures of data collected from more computer systems. More often, this type of solutions are based on storing and processing power of a server in order to run the report generation, it is usually a "thin" customer or even a web browser on the customer-machine. The last years have come with a diversification of the approaching modalities on dynamic reporting.

2. Data Mining Solutions. Because of the large amount of data and especially of the data complexity as well as the complexity of the relations between them, the man's possibility, even armed with the most efficient reporting and visualizing tools, to discover bonds between different events integrated in the data which are registered within the respective system, becomes even less. Here comes the data mining solution that discovers and verify automatically or semi-automatically the bonds between interrelated events.

Because of the large amount of data and of huge processing needs, both the dynamic reporting solutions and the data mining require a powerful informational infrastructure designed to enable storage, interconnected, processing and huge correlation capacities (we can talk here not only about the hardware but also about the software capacities, including here the specific parameters for every organization).

The central warehouse that shelters the totality of the collected data from the computer systems represents the central part of the system. It is best known under the name of Data Warehouse. In order to collect data in the data warehouse from more computer structures, that can be later correlated, even if they come from other systems, it is usually necessary a computer layer to collect, clean, filter and transform the ultimate data of the operational systems. Usually, this task is fulfilled by the ETL services (Extract, Transformation, Load) of BI systems.

BI integrated systems offer data extraction, data analysis removes irrelevant information, the risk management and offers support for managing decisions at high speed and with almost perfect relevance. Business is run through IT systems within BI and do not depend on the computer department.

The implementation of BI solutions with the Qlikview application

For exemplifying, I consider a firm which deals with the human resources analysis within a company. In order to implement the BI solutions designed for the human resources analysis we used the QlikView application that enables the connection to any data source (ERP, CRM, Microsoft Excel, logos).

QlikView represents a new generation of BI software, analysis and reporting that delivers in a quarter of the time, at half price, doubly the value of the traditional systems based on the OLAP technology.

The extensive facilities on personalization and visualization of information, combined with advanced capabilities in collaboration and implementation work, make the QlikView application easily adaptable inside the organizations (companies or public institutions) that intensively use electronic stored data. The QlikView applications are developed rapidly, they are easily administered by the IT department within a company,

and they offer to the final users an unlimited freedom of queries, at any level of database.

With just a few clicks the users can create and surf intuitively through the most advanced types of analysis. All the objects of an analysis are dynamically inter-connected – a single click on a certain feature of an object this can be adapted as criterion for other objects of an analysis. What is more, detailed information is given. There can be created all kinds of reports that can be distributed only through physical and verbal means (e.g. mail or web sites).

A very important element in building calculation pages is represented by the features that are chosen as representative. Thus I have used: time, department names, salary earners' positions, the budget groups, etc. These can be selected and modified on each page and they can be combined by defining groups.

A part of the designed reports for accomplishing an analysis on human resources within a company are presented in the following:

1. Analysis on the net salary: where the departments and the positions within a company are represented, under the form of a chart/table (see figure 3). For every position, for a three month period of time, the following positions are accounted: the number of the employees having the same position, the total sum of the gross and net salaries, the average net salary on every employee during a three month period of time and the average monthly, the value of the bonus category granted to the employees on every position as well as the percentage value of the bonus from the standard salary. It is obvious that this graphic can be modified, just by several clicks on the mouse, in order to get the same situation for every employee partially and in this way, the salary differences from month to month, can be noticed for a certain employee and also for two employees who are on the same position.

Nume Departament	FUNCTIE	Numar angai...	Tarifar incadrare	Brut	Net	Medie NET pe angajat	Medie LUNARA NET pe angajat	Bonus	Procent bonus din tarifar
		1148	4,065,882	5,686,242	4,149,766	5,392	1,816	690,570	16.98%
Service	Mecanic Auto	271	680,942	1,095,200	804,309	2,968	989	35,496	5.21%
Vanzari	Agent Vanzari	147	388,604	595,532	442,414	3,010	1,003	51,508	13.25%
Retea Magazine	Vanzator Gestionar	103	250,950	323,052	241,644	2,346	782	19,864	7.92%
Operatiuni Logistice	Sofer De Distributie	75	233,810	399,448	289,904	3,865	1,288	76,340	32.65%
Operatiuni Logistice	Distribuitor	56	213,051	336,866	243,587	4,350	1,450	58,828	27.61%
IT	Operator Calculator	42	213,440	272,420	196,174	4,671	1,557	17,025	7.98%
Operatiuni Logistice	Manipulant	36	67,490	92,099	69,579	1,933	644	17,075	25.30%
Operatiuni Logistice	Gestionar	35	108,800	156,349	113,379	3,239	1,080	35,548	32.67%
Mentenanta	Lacatus mecanic	32	126,580	177,880	129,592	4,050	1,350	8,534	6.74%
Operatiuni Logistice	Facturist	26	92,554	128,900	93,822	3,609	1,203	33,169	35.84%
Mentenanta	Maistru	23	86,365	120,766	87,782	3,817	1,272	7,650	8.86%
Vanzari	Lucrator Comercial	22	68,418	94,967	69,513	3,160	1,053	30,639	44.78%
Mentenanta	Electrician	21	80,200	118,429	85,829	4,087	1,362	15,537	19.37%
Administrativ	Ingrijitor Curatenie	18	34,080	33,804	26,563	1,476	492	951	2.79%
Mentenanta	Lacatus Mecanic	10	41,175	60,532	43,742	4,374	1,458	7,385	17.94%
Achizitii & Contracte	Agent Achizitii	9	36,960	41,931	30,185	3,354	1,118	4,319	11.69%
Operatiuni Logistice	Mecanic Auto	9	105,906	147,402	104,868	11,652	3,884	41,238	38.94%
Mentenanta	Instalator	8	26,135	42,020	30,628	3,829	1,276	2,090	8.00%
Operatiuni Logistice	Dispecer	8	34,425	54,463	39,080	4,885	1,628	14,258	41.42%
Parc auto transp	Sofer	7	70,960	90,413	64,409	9,201	3,067	21,757	30.66%
Retea Magazine	Operator Calculator	6	17,010	18,279	13,630	2,272	757	1,229	7.23%
Achizitii & Contracte	Gestionar	6	22,300	23,478	17,332	2,889	963	1,155	5.18%
Vanzari	Manager Zona	6	36,000	55,220	39,333	6,556	2,185	19,170	53.25%
Mentenanta	Inginer Mecanic	6	43,990	50,051	35,755	5,959	1,986	4,086	9.29%
Mentenanta	Inginer	5	19,190	25,128	18,391	3,678	1,226	2,355	12.27%
Operatiuni Logistice	Customer Service Spe...	5	23,040	25,764	18,837	3,767	1,256	3,387	14.70%
Achizitii & Contracte	Manipulant	4	9,754	9,949	7,547	1,887	629	200	2.05%
Mentenanta	Zugrav	4	11,750	14,767	11,036	2,759	920	1,465	12.47%
Mentenanta	Strungar	4	12,580	15,973	11,829	2,957	986	977	7.77%

Figure no. 1 Analysis of net salary

2. Evolution of costs contains the graphic with monthly values on net salary, gross salary, standard salary and on the total cost for a three-month period of time. This graphic enables the manager to notice the monthly differences between the expenses

with the employees and it offers computer support for controlling the salary increases within a firm with a decentralized decision and with many employees.
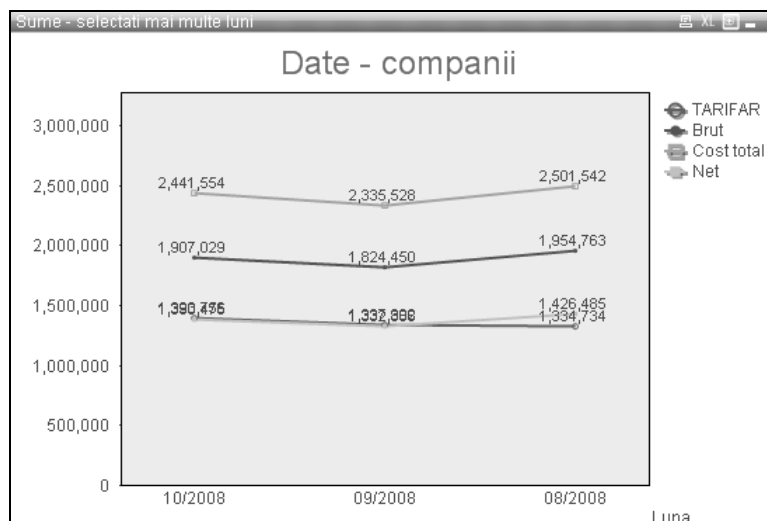

Figure no. 2 Costs Evolution

3. Records of leave days contain information referring to the average number of days regarding the sick leave and the rest leave carried out by the employees of every company for a three month period of time.

Nume Departament	Numar angajati	Concedii medicale / nr angajat	Concedii odihna / nr angajat	Medie lunara BRUT	Numar tichete de masa / nr angajat
	1,148	**2.5932**	**6.6019**	**1,895,414.0000**	**48.9564**
Marketing National	1	0.0000	11.0000	5,293.6667	55.0000
S.i.p.p.	1	0.0000	25.0000	1,755.3333	41.0000
Administrare vanzari	2	0.0000	3.0000	2,825.0000	33.0000
Audit Intern & Cig	2	0.0000	6.5000	4,061.3333	59.5000
Juridic	2	0.0000	14.5000	6,160.3333	31.0000
Coordonator Achizitii Retail	3	0.0000	8.6667	10,023.6667	56.6667
Gestionare Numerar	3	0.0000	7.0000	2,682.3333	39.0000
Administrare Retea Magazine	4	0.0000	16.2500	2,404.0000	13.2500
Marketing	4	0.0000	3.7500	28,894.3333	58.7500
Buget & Raportare Manageri...	5	0.0000	9.4000	27,525.6667	55.2000
Secretariat	5	0.0000	9.0000	8,454.0000	56.4000
Parc auto transp	7	0.0000	7.4286	30,137.6667	48.7143
IT	53	0.1698	7.1321	117,354.0000	54.0000
Achizitii & Contracte	32	0.2813	6.7813	76,296.6667	49.3750
Resurse Umane	12	1.0000	6.3333	24,157.3333	48.1667
Mentenanta	119	1.0252	8.3109	222,069.0000	52.9916
Retea Magazine	120	1.2500	8.2583	124,755.3333	49.1833
Operatiuni Logistice	273	1.7839	6.3297	485,261.6667	50.2198
Administrativ	35	2.1714	6.7714	31,244.3333	50.9429
Service	271	3.5387	5.8044	365,066.6667	45.3985
Contabilitate & Controlling	12	5.2500	5.6667	40,131.3333	52.9167
Vanzari	181	6.0221	5.3315	269,848.6667	47.8840

Figure no. 3 The records of leave days

Just by several clicks on the mouse, this graphic can be modified in order to get information referring to the sick leaves, the rest leaves and the number of the meal tickets for each salary earner, or for each function of department, or for other period of time(one month or inconsecutive months)

4. Bonus analysis contains for each department of the company the sums in the incentive category (bonus) given to the employees every month (see figure 4). The chart can be used for statistics on the bonuses given by a company to its employees in a month or over a certain period of time. At the same time, the sums in the incentive category given by the company to its employees can be compared, for the whole company or for each department. By placing the mouse on a certain department in the chart (a certain color) detailed information on department, month and the incentives given to employees are shown.
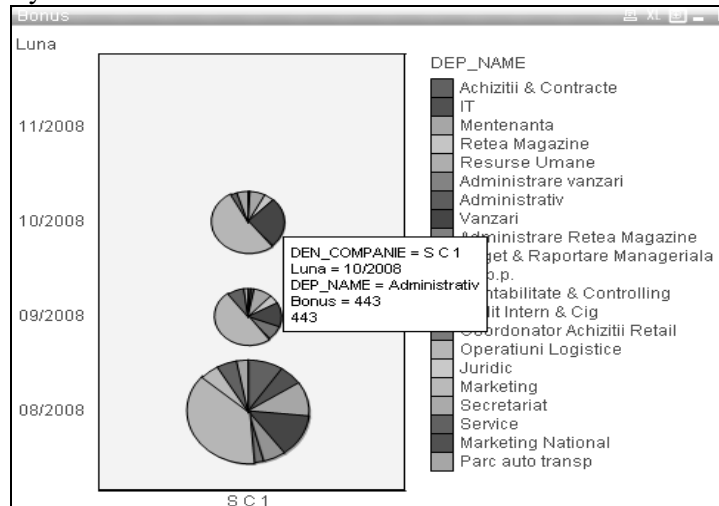

Figure no. 4 Bonus analysis

5. The analysis of extra work hours done by the company per month (see figure 5). The average of total expenses, the average number of extra hours, and the value of the extra hours per employee are calculated for the company. The last column shows the ratio of the value of the extra work hours to the total expenses of the department.

The features of this report can be modified and thus the total expenses per department, per salary earner or per budget group can be carried out.

Nume departament	Functie	Numar angajati	Cheltuieli totale	Medie cheltuieli	Ore suplimentare	Medie ore suplimentare	Valoare ore suplimentare	Ore suplimentare in cheltuielile tot...
		1,172	7,327,176	9,584	61,268	8	711,072	9.70%
Contabilitate & C...	Contabil	4	44,359	11,090	0	0	0	0.00%
T	Administrator Sistem	4	25,638	6,409	0	0	0	0.00%
Operatiuni Logisti...	Ingrijitor curatenie	4	7,110	1,778	0	0	0	0.00%
Resurse Umane	Administrator Salarizare	4	24,108	6,027	0	0	0	0.00%
Resurse Umane	Inspector Resurse Umane	4	18,262	4,565	0	0	0	0.00%
Achizitii & Contra...	Gestionar	6	30,258	5,043	0	0	0	0.00%
Operatiuni Logisti...	Customer Service Specialist	6	32,839	5,473	0	0	0	0.00%
Vanzari	Manager Zona	6	72,075	12,012	0	0	0	0.00%
Retea Magazine	Operator Calculator	7	23,562	3,366	0	0	0	0.00%
Achizitii & Contra...	Agent Achizitii	9	53,985	5,998	0	0	0	0.00%
Administrativ	Ingrijitor Curatenie	18	44,034	2,446	0	0	0	0.00%
Vanzari	Lucrator Comercial	22	121,888	5,540	0	0	0	0.00%
Operatiuni Logisti...	Casier	4	24,588	6,147	5	1	65	0.26%
Operatiuni Logisti...	Mecanic Auto	9	189,805	21,089	12	1	182	0.10%
Operatiuni Logisti...	Dispecer	8	69,969	8,746	13	2	207	0.30%
Achizitii & Contra...	Magazioner	3	84,401	28,134	16	5	209	0.25%
Operatiuni Logisti...	Ajutor gestionar	2	12,458	6,229	18	9	213	1.71%
Operatiuni Logisti...	Facturist	27	165,098	6,115	14	1	226	0.14%
Operatiuni Logisti...	Sofer	1	6,153	6,153	16	16	261	4.24%
Operatiuni Logisti...	Manipulant	42	120,001	2,857	65	2	476	0.40%
Operatiuni Logisti...	Gestionar	37	202,477	5,472	44	1	504	0.25%

Figure no. 5 The analysis of extra hours

Conclusions

We must admit that these technologies are at the beginning of a long journey, in a world where the key to success lies on the ability to make better decisions and in a much shorter period of time than the competition. However, the life of a company depends more and more on such decisions, fact that makes impossible to deny the benefit that the BI can bring.

The cost of implementing the BI systems is rendered by a visible save of time that is accomplished by the company's management for the period when it gets the information and by the earnings of money that come from the quality of decisions.

The implementation of a BI solution in human resource administration influences the business process, both from financial and operational point of view, and offers the informational support for financial analysis, predictions and decision making in according the salary rights to the personnel.

Even though in Romania the interest for this kind of solutions does not raise to the level of the developed markets, it seems that the situation has changed lately. At the world level there have occurred changes in the basic philosophy of the BI software solutions.

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