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Smart Data as a Result of ERP System and Human Capital

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Abstract

The purpose of the article research is to discuss about the topic of smart data with the help of an integrated Enterprise Resource Planning (ERP) system that can provide detailed reports for all the internal requirements of a company in the accounting field. These reports acquire the smart attributions necessary for the sustainable development of the activity carried out. Regarding the management objectives, the ERP system offers intelligent solutions about the detailed reporting and analysis. This smart data can be accessed in a real time manner if the human capital of the company is well trained to understand the data transmitted by the ERP system. In order to streamline the process of reporting and analyse the key data, it is recommended that before using and implementing an integrated ERP system, human capital represents the value added on the integrated system. In order to reach a maximum level of performance in the company, it is recommended that both staff and structural capital (ERP) work in close connection. A case study was made, based on the application of a questionnaire that allowed to measure the importance of switching from accounting software to an ERP system developed especially for the needs of the company. It has been applied in the financial-accounting departments within several companies. The respondents represent the employees with higher studies in the economic field. They assisted the transition from an accounting system to an ERP system in the company where they operate and noticed the beneficial differences of an ERP system. If this system influences the staff employed through actual working time, smart data from ERP improves the future perspective of the top management. Based on the obtained results, the efficiency of the working time and the improvement of other performance indicators regarding those future directives of the company were concluded.

Keywords: Smart Data, Accounting systems, Enterprise Resource Planning (ERP); Organizational Performance; Human capital.

JEL Classification: A10, C10, G10, M40, M50

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1. Introduction

In this article we started from the idea that an ERP system is an efficient solution for generating smart data for any company operating in the market. Therewith, we followed up its impact on human capital. Through the subsequent contribution of human capital on the information system and the need for financial-accounting data processing, we want to identify the contributions of the information system and human capital.

This article is structured in seven parts. In its first parts we approached three important topics: ERP system, human capital and smart data, based on the specialised literature. The research methodology is composed of four essential components: the literature review, case study, questionnaire and own analysis.

The literature review aimed at the attributes of an integrated ERP system and what it represents for companies in different fields of activity (production, marketing, service provision). The objectives of this article are based on the smart data that an ERP system can offer on working time. The objectives in human capital terms are to identify the degree of involvement and bringing value added by human capital in related activities following the automation of primary accounting; changes in the number of staff following the implementation of an integrated accounting system and the change in actual working time. The system offers this smart information because it can process large series of data. The techniques for evaluating the results emitted by the integrated ERP system are complex. These are eliminating the risk of omitting a key factor in the decision making by the management. In order to respond to the management needs in a relatively timely manner, human capital had to adapt to new demands.

In the second part of the article we conducted a case study, based on the application of a questionnaire that allowed measuring the importance of the transition from an accounting software to an ERP system developed especially for the needs of the company.

The article includes a research on the companies operating on the Romanian market. Based on the obtained results, we performed a statistical analysis, identifying the influence of the presented subject on the vision of Romanian economists.

2. Construction of references

However, the relationship between human capital and the ERP system is also based on the level of knowledge accumulated and currently existing within the company. At the same time, the intelligent results, the technical resources, the organizational needs and the process of implementing the ERP system are the main factors of its use. The results of the research determine how managers can improve the benefits of using the ERP system by achieving optimal results (Nwankpa, 2015).

Moreover the capability of an ERP system is to fulfil the company needs, increasing the user's effectiveness, including the way that employees and system operate, work, and communicate (Ruivo et al., 2020).

The value of an ERP is defined as the extent to which business objectives and performance are improved through the adopted ERP system (Zhu and Kraemer, 2005). Value could also be measured by satisfaction and productivity of system users (Zhang et al., 2005).

The use of ERP is defined as the extent to which the system carries out the activities of the company's value chain (sales, services and purchases). This dimension has its origin in the degree of the system use in sales, services and procurement (Zhu and Kraemer, 2005).

The combination of creating new knowledge and generating value is fundamental to a company's sustainable competitiveness. If the ERP system is planned and properly implemented, it acts as a value enhancer that empowers three value generators (operational processing efficiencies, information provision and new knowledge creation activities) contributing to strategic development (Eslam Nazemi et al., 2012).

Given that the components of intellectual capital are human capital, structural capital and relational capital, we can speak of the competence of the enterprise, where human capital and structural capital act, and of the performance of the enterprise, where relational capital acts together with the knowledge of human capital (learned capital) (Mavridis, 2012).

The success in implementing a large venture project that can change the course of action of a company is given by the human capital that acquires a set of essential business attributes and IT skills (Skok et al., 2002).

Hawa et al. (2002) pointed out that the improvement of an enterprise relies on the success of software engineering projects, which in turn depends on the human resources. Focusing on the human competences has a direct impact on the outcome of the project.

Innovation is the one that differentiates between market competition and attracting new customers (Ornek et al., 2015). This connection is realized through human-relational capital, both having direct implications on the performance of the company. Innovation is modelled in this way, according to the needs of the customers, shareholders, stakeholders and the feedback received from them (Ornek et al, 2015). As intellectual capital encompasses the most important productive functions in an enterprise, it acts directly on the value of performance, by bringing in new clients (developing relational capital), by maintaining structural capital according to market demands and development, and by acting on human capital which, in our opinion, includes all the other components of intellectual capital. Innovation is associated by Ornek et al. with structural capital, but it should also be associated with human capital. So, we believe that innovation is about implementing an ERP system for accounting needs. Human capital holds the key to innovation both for structural capital and relational capital. Thus, an innovative work behaviour, which results from the actions of human capital, together with the

structural contribution, leads to a positive influence on the performance of the enterprise. (Ornek et al., 2015).

Real-time reporting can be done using technological responses such as business process management and monitoring of business activity (for example, by supporting more extensive accounting reporting with more performance indicators), devices mobile (for example, by using the ability to receive immediate notifications), smart data (for example, by selecting the best visual option to represent data and achieve goals), integrating enterprise applications (for example, by using specific languages and powerful reporting tools, which provide a method of labelling financial information) (Antonio Trigoa et al., 2014).

High quality business reporting is the basis of strong and sustainable organization, financial markets and economies. (Madan Lal Bhasin, 2017). We can achieve high-quality business reporting if we have an integrated system in the company that provides smart data and well-trained employees who use the system functions to the maximum capacity. At the same time, ERP system implementation needs an organizational basis to support its development within the company. Therefore, Hamel and Prahalad (1994, cited in Lengnick-Hall et al., 2004) stated that the basis for ERP system implementation should consist in the culture and organizational processes and human capital. We can say that human capital, regardless of the information system performance degree, is indispensable. We believe that the performance of the results and the smart data generated by an advanced informatics system needs a high user competence (Hertati et al., 2015). Therefore, in order to benefit from an advanced system, there is a clear need for well-trained staff within the company. Human capital investments are necessary for the company to become flexible enough to adapt to new emerging trends (Mičiak, 2019), and this investment has to be made at the same time as the investment in implementing an informatics system to meet all the company needs.

Therefore, smart data and the advanced informatics system implementation lead to the idea that as processes are automated, human capital becomes the strategic asset of a company, and maintaining human capital with superior skills is a means of sustaining competition (McCoy et al., 2019).

3. Problem Statement

Due of the fact that accounting systems offer only accurate data about company situation, the need for an analysis perspective has been felt at the top management level of several companies.

Our research idea was to demonstrate that an ERP system brings value added to a company by the smart data that it can generate, thus providing detailed, structured reports based on the requirements applied by any user.

From the experience on the labour market we have noticed that at this moment smart data are often represented by intelligent systems that can generate accurate, precise and concrete information that a company needs.

Often, these systems are the ERP type, and can be modelled according to the requests and particularities of information of each company. From their own

perspective, smart data is that information that gives the user access to what is necessary / essential, without processing them to achieve the desired result. These systems can process a large volume of data and materialize the results that the company uses to analyse the targeted elements. The data subject had to use an ERP system and to have the necessary knowledge of what accounting means. We also looked for those people who used both: an accounting system and an ERP system to make the difference.

Therefore, our researchers' idea started from the fact that regardless of the financial-accounting process automation degree, human capital is an asset that is indispensable for the company. Its preparation in accordance with the expectations that the company has from the IT system, must be at the highest level.

Raising standards on human capital is the company's expectation for the information system. Developing and training are the first steps that a company takes in order to implement a new computer system.

To conduct the research, we quantitatively measured the responses and analysed their vision on the implementation of an ERP system.

As expected, the ERP implementation and the preparation of human capital in this regard have a significant influence on all factors reported in the questionnaire. The choice of questions was based on the situations faced by company employees when using both accounting software and an ERP system, thus being able to make a materialized difference in the actual working time.

The purpose of the research article is related to the subject of smart data that can be provide / manage by an ERP. This system can provide detailed reports for all the internal requirements in the financial or commercial field. At the same time, we followed up the impact on human capital, not only through the actual working time, but also through the value added it can bring. These reports acquire the intelligent tasks necessary for the sustainable development of the company activity. In terms of management objectives, the ERP system provides intelligent solutions for detailed reporting and analysis.

Regardless of the balance sheets, the ERP system can be developed on a certain area that the company needs (e.g.: some companies want to observe a clearer and higher analytical position on the stocks, while another company needs a detailed analysis on the trade receivables). Other companies had to adapt their internal situation to the permanent needs of external users (e.g.: websites for displaying services / goods offered by the company). Another problem reported was about the time spent on data analysis by the employees. Time is one of the most important factors to bring value added, being the key to performance. The system offers intelligent reports, but it is definitely necessary that the employee understands the results. This investment is essential, for the human capital vs. structural capital, as well as the effective working time vs. global performance relationship. The mentioned problems were quantitatively measured based on a questionnaire of 20 queries. It was related to the vision of the interlocutor, the transition from accounting informatics system to integrated ERP system, and the employees' reaction to the changes that occurred. The intention was to measure the impact of

change on the performance of human capital in the internal economy of the company. The employees' first reaction for the change was not a positive one, because the things should be assimilated in an unexpectedly large volume. Although initially the change was not considered opportune, during this time they enjoyed the efficiency of the work tasks (before they had to process reports according to certain categories, at present they can check the category by obtaining the desired report in real time).

4. Research Questions/Aims of the research

A first question of the study is whether an ERP system is a solution to generate smart data that a company needs. Another question: Is the integrated ERP system an efficient solution in terms of working time savings vs. effectively analysing the generated reports? Following the answers received, it was found that the ERP system brings an improvement and development of the economic activity for a company through human capital. The next question is: "Can the ERP system implementation lead to accounting automation?" However efficient an integrated system is, it requires well-trained employees to add real value for a company, and human capital remains an indispensable asset. One last question is: how developed is the vision / perspective of the Romanian respondents on the analysed subject?

5. Research Methods

Our objective is to show the impact of smart data issued by an ERP system in a strong relationship with the human capital on the socio-economic performance at the company level (human capital relationship, structural capital, relational capital). From our experience on the labour market we have noticed that at this moment smart data is limited to intelligent systems (most of them – ERP systems) that can be modelled according to the need and particularities of the information of each company. These systems can process a large volume of data and materialize results that the company uses for analysing the targeted elements. The socio-economic model analysis is based on the effective working time from the database responsibilities, which was subsequently automated through the ERP system. The analysis method used was quantitative, the questionnaire. The questionnaire was realized on the Survivor platform, being free of charge. Depending on the answers received the results were analysed and interpreted on each question separately. The questionnaire was created in January 2020. Responses were received within 2-3 months.

6. Findings

We used a sample of 35 people, from the financial-accounting department of several commercial companies operating on the Romanian market, in Bucharest. The number is relatively small because at this moment the financial departments on the Romanian market have relatively few employees. This low number of employees in the financial department is also due to the automation of accounting

systems. At the same time, this number is also due to the fact that this questionnaire was not offered to any person. Target persons had to have the necessary knowledge about what accounting means and about using an ERP system. We also looked for those people who used both: an accounting system and an integrated ERP system to make a difference. To carry out the research we measured the answers quantitatively and analysed their vision on the implementation of an integrated ERP system. We analysed its direct influence on working time based on the smart data provided by the system. In order to carry out the actual research, according to the answers received from the questionnaire, the results were analysed and interpreted based on statistical tests. As expected, the implementation of an ERP system has a significant influence on all the factors reported in the questionnaire. Because of the fact that it was addressed to the people directly involved in the use process, the results were relatively close to reality. The choice of questions was based on the situations faced by the employees of the companies when using both an accounting software and an ERP system, thus being able to make the difference materialized during the actual working time.

In order for any reader to have a more detailed idea on the asked questions as well as on the answers received from the Romanian respondents, we highlighted a chart, which included the structure of the questionnaire. The questionnaire was numerical and had unique answers, which the respondents were able to score from 1 to 5. Variant 1 meant "the least", and variant 5 meant "the most" (please see figure 1). This graph presents the exact answers of the respondents on the topic of the questions addressed.

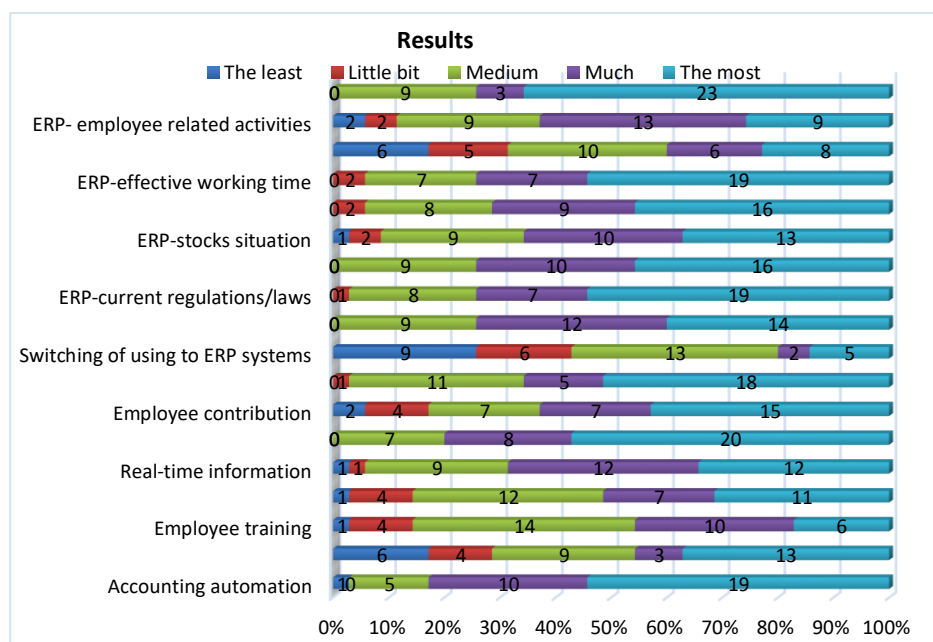


Figure 1. Results of the questionnaire
 Source: own processing, questionnaire results

Nevertheless, we can see the total number of respondents and also the frequency of their answers based on this graph. Taking into account the fact that the received answers were "the most" (more precisely the answers with number 5, which represents the variant "the most") predominated in the questionnaire we decided to highlight on a separate graph their frequency in percentages (please see figure 2). The highest percentage was recorded on the questions related to the ERP system and smart data. Therefore, the subject is quite common and appreciated by Romanian respondents.

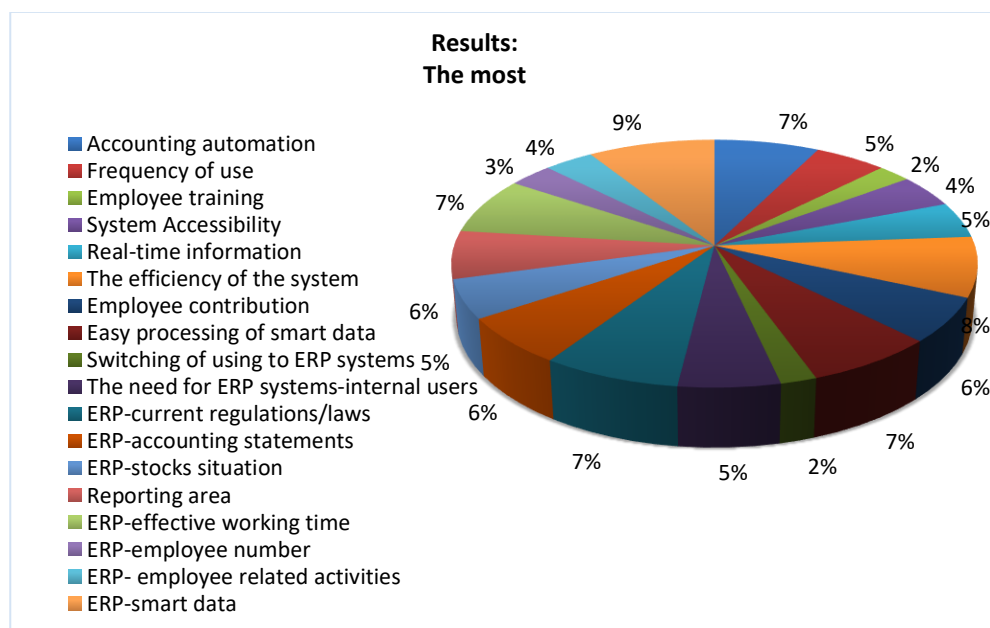


Figure 2. Results: the most

Source: own processing, questionnaire results

In order to accentuate in as much detail as possible the answers received, we also made a statistical analysis based on a regression. The research is based on the questionnaire aimed at a multifactorial model. The questions represented the variable X, and the answers received represented the variable Y. Both figure 1 and figure 2 show exactly what questions were addressed to the respondents.

Table 1. Summary output:

Regression Statistics	
Multiple R	0.9999
R Square	0.9999
Adjusted R Square	0.9230
Standard Error	0.0005
Observations	18

Source: own processing using questionnaire results

Multiple R is the multiple correlation coefficient and has a value close to the extreme of 0.99, indicating a direct and strong connection. R square is the correlation coefficient on the square and has a value of 0.99. The square R is 92% of the variation of y, which is influenced by x. The rest of up to 100% is caused by the residual components (deviation factor - Adjusted correlation coefficient - adjusted R square). The standard error is 0.05%. Of all the questions, 18 could be quantified. The other 2 questions refer to the age of the respondents and to whether they are currently using an integrated ERP system.

Table 2. ANOVA

ANOVA	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	5	17.9999	3.5999	12283794	8.1563
Residual	13	3.8099	2.9307		
Total	18	18			

Source: own processing using questionnaire results

The sum of the variation is both due to the regression value of 5 and the residual amounting to a value of 13, out of a total of 18 (these are the liberty degrees). The sum of the squares of the regression is the value of 17.9999 (D square $y / x = \sum_{i=1}^n (y_i - \bar{y})^2$), and the sum of the squares of the residual value (D square $e = \sum_{i=1}^n (Y_i - \hat{y}_i)^2$) adds up to 3.8099. Ms-The average of the squares or the corrected dispersion sum the values of 3.5999 for regression with degree of liberty k and respectively 2.9306 for the residual value having degree of freedom of n-k-1, the total degree of freedom being of n-1. The dispersion corrected for the regression value is calculated as "S square $y / x = D \text{ square } y / x / K$ " and the corrected dispersion of the residual value as "S square $e + D \text{ square } e / nk-1$ " being equal and square root of the MSE. The total corrected dispersion uses the formula S square $y = D \text{ square } y / n-1$. Significance F is the test F for ANOVA, more precisely the set of null hypotheses: the model is not statistically valid and the alternative hypothesis: the model is statistically valid. Critical region $F \text{ calculation} > F; k; n-1-k$, summing the value of 8.1564 > 0.05, which confirms that the null hypothesis is rejected, and the model is statistically valid. Therefore x is valid as a significant factor. The number 1 means „the least” and 5 means „the most”.

The questions represent the free term, and the answers received from the respondents represent the chosen variable. The test statistic represents the significance tests for the parameters. Lower 95% (left limit) = $b - (t \text{ alpha} * se (b) - \text{standard error})$. Therefore, the alpha parameter is significant, because the probability that H1 can handle (which it claims to be significant) $99\% > 95\%$. Upper 95% (right limit) = $b + (t \text{ alpha} * s.e. (b) - \text{error margin})$ and summing values over 99%. Therefore, the beta parameter is significant.

7. Conclusions

To conclude, we can say that the smart data provided by an ERP system has a significant impact and influence for a company and its employees. From the statistical results, we have shown that the answers are significantly influenced by the issues raised. The implementation of an ERP system in the Romanian market proved to be welcomed by the top management, but it was accepted with more difficulty by the directly productive employees due to the novelty of the software. The analysis was based only on working time, without taking into account the costs generated by the system and the implementation itself. Human capital is indispensable and an interesting study result is that respondents did not feel sufficiently prepared for efficient and rapid use of the system, a need that staff felt, which shows the company's desire to reduce training costs. Therefore, the respondents consider that they have a very high impact on the tasks contribution in the integrated system, even if it meets internal and external requirements. Therewith, the results show that, by implementing an advanced IT system, the company can benefit from value added, due to the reduction of working time from operational activities and increase in the time that human capital has to analyse and improve the work of structural capital. Informatics can be constantly improved based on the findings, discoveries, and ideas for improvement proposed by the human factor. The study was conducted in small companies, based on the answers received from the employees of the financial departments. The results of the study showed the improvement of working time for certain areas of activity. In the case of accounting automation, the need for prepared, trained and innovative employees is a must have. The system has determined the existence of smart data at the level of the analysed companies, which have responded to the internal and external needs of the companies.

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