



IMPROVING GRADUATES' EMPLOYABILITY IN IT FIELD. THE CASE OF ACCOUNTING AND INFORMATION SYSTEMS STUDY PROGRAM

Luminița HURBEAN*, Vasile Daniel PĂVĂLOAIA**, Doina FOTACHE***

Abstract: *The studies published in 2015 analyzing the need for human resource in Iasi IT market (the most representative market for the North-East of Romania) conclude that the demand for specialists exceeds by far the number of graduates from faculties which train IT specialists. Nationwide, within the FEBA², the employment rate for the students that complete the Economic Informatics undergraduate program and different master programs that specialize students in BIS³ is approximately 95%. We strongly believe that the students graduating the program AIS⁴ could get a higher employability in the IT area and appropriate improvement measures would beneficially contribute to a higher rate of employability, but also to the diversification of their professional horizon and their adjustment to the IT field requirements for professional accountants nowadays. The research also attempts to determine the profile of AIS graduates and their compatibility with IT related positions in the labour market and graduates' employability in terms of knowledge, skills and attributes relevant to the employers' needs.*

Keywords: *Accounting and Information Systems study program, IT market, Accounting profession*

JEL classification: *M15, M41, C15*

* Luminița HURBEAN, Conf. Dr., Facultatea de Economie și Administrarea Afacerilor, Universitatea de Vest din Timișoara, Romania, luminita.hurbean@e-uvvt.ro

** Vasile Daniel PĂVĂLOAIA, Conf. Dr., Facultatea de Economie și Administrarea Afacerilor, Universitatea "Al. I. Cuza" Iași, Romania, danpav@uaic.ro

*** Doina FOTACHE, Prof. Dr., Facultatea de Economie și Administrarea Afacerilor, Universitatea "Al. I. Cuza" Iași, Romania, doina.fotache@feaa.uaic.ro

² Faculty of Economics and Business Administration

³ Business Information Systems

⁴ Accounting and Information Systems

1. INTRODUCTION AND RESEARCH PURPOSE

Although there's reticence, the cloud and software-as-a-service (SaaS), along with several other technology trends — like social, mobile, and big data/analytics— are changing the ERP dominated enterprise software landscape (Piazolo,2013); (Wortmann,2014). As information technology advances, organizations react and create new jobs to account for new responsibilities. Important evolutions relevant to the business landscape and their impact to organizations and their information systems are for short described next.

Cloud adoption is number one key trend shaping tomorrow's enterprise software landscape (Zhong,2014). Unlike traditional ERP system, Cloud ERP provides much more flexibility and ease of use without increasing the costs and providing features that accommodate every type of business (Grubisic,2014). Cloud Computing and ERP together equal innovation and it will mark the enterprise information system.

The increased availability of services to the mobile devices is why mobility and the demand for real-time information became another important enterprise software trend. As some research indicated, mobility integration turned out to be a major distress for organizations (Dospinescu,2008), but major projects are still performed. It is expected that in the near future tens of millions of users will use ERP, CRM, SCM or BI applications on a mobile device. Mobile devices will replace traditional PCs in hosting of business applications.

Using a classical information system today, the percentage of exploited data is under 25%. To reach the potential insights contained in the ocean of data, integrating ERP with big data analytics is another important evolution in enterprise systems. Business analytics is extremely relevant nowadays, so organizations are interested in data analytics professionals, who are now refining their skills to adapt to the influx of data flowing in and out of the company (Ekman,2015). The integration between ERP and big data should enable organizations to have a better and wider - in scope - best practices (Glowalla,2014).

Last, but not least, the use of emergent social software platforms represents a key trend. Enterprise 2.0 is a concept which promotes the integration of the social and collaborative tools of Web 2.0 (Web applications that facilitate interactive information sharing, interoperability, user-centred design and collaboration on the

World Wide Web) into the enterprise environment (Usman,2014). Profound changes in existing positions and new jobs are also expected in this respect.

These arguments corroborate that software solutions that run businesses - especially ERP systems - are undergoing profound changes. New business trends require new responsibilities, which change the attributions of current positions and also create new jobs and require new expertise. Professor Mantz Yorke defined employability as 'a set of achievements – skills, understandings and personal attributes – that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy' (Yorke,2006). However, in the new technological context, employability is more than having a graduate job, it entails a big amount of versatility, the capacity of the graduate to function in a job and be able to move between jobs, thus remaining employable.

Universities and the specific study programmes - mostly within the Faculties of Informatics and Business - are expected to be aware of the presented trends. The shift to what many experts call "the post-PC age" is happening as we speak, graduates with a renewed set of skills and knowledge are expected in organizations to utilize their abilities to help business growth and enhance operations (Fotache M., et al, 2015). Because we believe that it is the university's mission to produce graduates prepared to achieve high personal and professional standards.

Trying to summarize the skills and knowledge that employers expect from graduates, we reach to the following list:

- To be 'IT' literate.
- To understand the businesses processes, and integrate accounting to finance, manufacturing or distribution.
- To be technically aware with a good understanding of databases.
- To understand IT project management.
- To have communication skills that allow them to communicate non-technical information to technical people.
- To have the initiative and commitment to continue their professional development and help others to impart their knowledge.

For employers in the IT industry, disciplinary knowledge and understanding are extremely relevant, the generic academic qualifications are not enough. In this context, graduates of programmes that are not 100% IT oriented have new

opportunities in the labour market, if they are in the possession of relevant achievements. We consider this may be the case of the Accounting and Information Systems bachelor programme, which is one of the most successful programmes if we consider the number of enrolled students - we have a previous analysis of the potential of this study programme (Fotache and Pavaloaia, 2015). Although the enrolled students are mainly attracted by the accountant or auditor career perspective, we consider that this programme might also produce IT employable graduates. We identified the need of qualified workforce in the local IT market, as we have investigated this market and become aware of its continuous increasing trend in the last few years. (Fotache D., Hurbean L., 2015) In the last 5 years we witnessed important investments in the Iași's IT market on one hand and the companies' struggle in finding adequate qualified employees, on the other hand. While the growing trend is expected to continue, we realize that it may represent an opportunity for graduates of programmes that are not entirely IT oriented. Our research will present their attraction for this professional trajectory and then how should the AIS bachelor programme respond to it.

We have analyzed the declared mission and specific goals of AIS study programme, as well as the curriculum and the course descriptions in the Faculty of Economics and Business Administration at "Alexandru Ioan Cuza" University. First of all, we certify there is a suitable teaching and learning environment with adequate facilities. The content and structure of the curriculum, staff, and facilities enable the incoming students to achieve the intended learning outcomes. We need to remark here that most outcomes target the accountant and the auditor professions. The program curriculum reveals professional modules (knowledge-based learning line) and projects (experience-based learning line). The curriculum components devote considerable attention to both general competencies (fundamental knowledge) and professional competencies (practice-oriented). The literature being used throughout the course is relevant and meets the level that should be expected of a professional bachelor's course. Also, the solid, firm and well-structured knowledge foundation is applied in real or simulated professional situations, but even more is expected - the theoretical knowledge should increasingly be aligned with actual professional practice and priority in the learning process should be given to issues that come up in real-world situations.

We should also mention that in recent years, a substantial number of students (more than 50%) enrolled for a Master's programme before or when simultaneously entering the job market. Their perception is very relevant in our opinion, as they are still in a study program (master level) and also in touch with the labour market; therefore they were involved in the following empirical research.

2. RESEARCH METHODOLOGY, DATA COLLECTION AND HYPOTHESIS

The research methodology applied takes into account the experimental method and probative thinking. The specifics of the experimental method assume the application following methods in the analysis and interpretation of the research results: the concordance, the difference, the consistency and the difference method, residues method and the method of concurrent variations. In the questionnaire-based analysis we have also considered, the quantitative method with positivist-explanatory orientation. The investigation carried out by the questionnaire has considered three investigation directions which form our researched hypotheses. , namely:

H1: At least a quarter of the students that graduate the AIS programme work in the IT area;

H2: Less than half the students that graduate AIS programme work in the Accounting area;

H3: The students that graduated AIS programme mainly use IT during their daily tasks, even if they don't work in the IT field.

Our research was conducted based on a questionnaire developed with Google tools and available in Google drive, distributed to 285 potential respondents. The criterion for creating the sample was to include only the AIS graduates that are currently enrolled in different master programs at FEBA. Thus, the target population are the FEBA's students that graduated the AIS programme and are currently enrolled in different master programs. In the light of the above information, the size of the population is 285 individuals. We have delivered the questionnaire in various manners: in person, via e-mail and through FEBA's Portal. This action leads us to obtaining a total of 120 valid responses. Therefore, the sample size is 120. Given the sample size, compared to the population size, and also by taking into account the fact that all students in the population had the same probability to be included in the sample, we consider the sample representative.

The questions delivered throughout the questionnaire are structured in two categories: general and specific questions. The last category has a logical and theoretical based correlation between the questions allowing us to match and pair the results. For instance, in some cases, throughout the questions we have linked the grades obtained by AIS students with the degree of promotions and benefits received as employees. This way we were able to state whether the students with high ranking prove the same standards in the real world environment. Another example of logic and correlated questions would be the case of questions for ERP tasks where it was investigated if the AIS graduates daily tasks performed at work are compatible with the requirements of the jobs within the ERP industry. The obtained answers were analysed using SPSS descriptive statistics using frequency analysis, descriptive indicators of central tendency, quartiles, dispersion indicators and by performing a robustness test.

3. FINDINGS AND RESULTS

Given the qualitative and quantitative nature of the data, we used descriptive statistics for both types of data. In order to follow and accomplish our goal which was to construct the profiles for AIS students that work in the IT&Accounting fields, we have used univariate descriptive statistics by analysing the central tendencies and the dominant behaviour of the respondents.

In the now-a-days competitiveness of the business environment, one will be surprised if not stunned to find out that in Romania, in the small and even medium sized firms, the IT tools are scarcely used only in certain moments (for preparing different financial reports and the trial balance sheet). Even though the general perception is that all employers working in the Business sector make extensive use of the IT tools in achieving their daily goals, we did not find a study, for the analysed region that would displays these figures. Therefore, our study investigates the percentage of AIS graduate students working in Accounting that fully use IT tools (generalized accounting software, ERP systems or other IT tools developed in-house) within their daily activities. Consequently, for the purpose of increasing the robustness of our conclusion that AIS students fully use IT on their daily tasks, we have performed a Chi-square test to verify if there is a significant association between the field of work and the use of IT tools.

The first investigated hypothesis

Assuming and then proving that some of the AIS graduates are working in IT area, our research displays their profile and characteristics. Thus, the results reveal that AIS graduates working in the IT environment have a 25.83% share on the entire sample and 47.69% share on the sample of students that are or have worked. Thus, our first hypothesis was confirmed. These students have said they followed and graduated some specialized courses organized by their employers. These students have many advantages, like for example a better remuneration.

Table 1 includes a series of statistics which highlight the characteristics of AIS graduates that are employed in the IT environment. For the purpose of outlining their academic profile in Table 2 it was carried out a description of the statistical indicators applied on the situation of the most relevant IT discipline's grades obtained by the students over the undergraduate period.

Table 1: Descriptive indicators of the characteristics of graduates working in IT field

	N		Mean	Median	Std. Dev.	Mode
	Valid	Missing				
Please specify your age:	31	0	23.97	23.00	3.230	
If you work in the field, specify the number of months since the last employment:	27	4	13.89	6.00	29.939	
Did you earn any promotions at work:	31	0				no
If you have been promoted at work, enter the number of promotions:	31	0	.26	.00	.631	
Have you benefited from wage increases to current job?	31	0				no
How many wage increases did you have at your current job?	31	0	.97	.00	2.243	

a. Multiple modes exist. The smallest value is shown

Table 2: Descriptive indicators of grades for AIS graduates working in the IT field

Grade	N		Median	Mode	Percentiles		
	Valid	Missing			25	50	75
[Enterprise Resource Planning]	28	3	2.00	2.00	2.00	2.00	2.00
[Information Systems analysis and design]	30	1	2.00	2.00	2.00	2.00	2.00
[End user computing]	24	7	2.50	3.00	2.00	2.50	3.00
[Business information technologies]	20	11	2.00	2.00	2.00	2.00	2.00
[Information system's security]	27	4	2.00	2.00	2.00	2.00	3.00

Based on the descriptive statistics analysis elaborated in Tables 1 and 2, we were able to build the profile of AIS graduates working in IT field, as follows:

- Their average age is 24 years
- 50% of them have at most 6 months since the last employment while the rest of 50% have at least 6 months since their last employment
- Most of them did not obtained any promotions or wage benefits at the current place of work
- Their academic performance are above the AIS graduates mean within the sample, while for some of the disciplines, 75% of graduates obtained at least grade 8 on a 1 to 10 scale.

The results obtained (using the concurrent variation method) confirm the hypothesis originally set, according to which, many AIS graduates that are enrolled in the 1st year of studies at FEBA master programs are working in the field of IT. The rest of the respondents indicated that in varying proportions, but in all cases more than 50%, could hold positions in the field of IT.

The second investigated hypothesis

The research through the second hypothesis looks at the AIS graduates employed in Accounting. The share of students that are working in Accounting is 43% and thus our hypothesis was confirmed. From the remaining difference (57%), it was proved that 25,83% work in the IT domain meaning that 31% are working in other areas than those for which they were prepared during their undergraduate studies. At this point, we should suggest that they might get employed in IT positions, where we see the job market is more generously sized compared to the accounting positions market. And we also consider that the university may also play a role with by amending the programme's curricula with courses such as Databases or Programming, or by upgrading the number of hours to some existing disciplines, such as Enterprise Resource Planning. Going back to the graduates that are employed in the field of Accounting, Table 3 highlights through the descriptive statistics their characteristics, while Table 4 analyzes their academic state.

Table 3: Descriptive indicators for characteristics of graduates working in Accounting

	N		Mean	Median	Mode	Std. Dev.
	Valid	Missing				
Please specify your age:	43	0	25.72	23.00	23	6.100
If you work in the field, specify the number of months since the last employment:	42	1	18.26	6.50	6	31.751
Did you earn any promotions at work:	43	0			2	
If you have been promoted at work, enter the number of promotions:	43	0	.40	.00	0	.728
Have you benefited from wage increases to current job?	43	0			2	
How many wage increases did you have at your current job?	43	0	.98	.00	0	1.626

Table 4: Descriptive indicators of grades for AIS graduates working in Accounting

Grade	N		Median	Mode	Percentiles		
	Valid	Missing			25	50	75
[Enterprise Resource Planning]	37	6	2.00	2.00	2.00	2.00	2.00
[Information Systems analysis and design]	34	9	2.00	2.00	2.00	2.00	3.00
[End user computing]	30	13	2.00	2.00	1.75	2.00	2.00
[Business information technologies]	6	37	2.00	2.00	1.75	2.00	3.00
[Information system's security]	5	38	1.00	1.00	1.00	1.00	2.00

As a result, based on the analysis performed in Tables 3 and 4, it may be outlined the profile of the AIS graduate working in Accounting:

- Average age is 26 years;
- 50% of them have at most 6.5 months since the last employment while the rest of 50% have at least 6.5 months since their last employment;
- majority did not obtained any promotions or wage benefits at the current place of work;
- most of them obtained grades of 8 and 9 (on a 1 to 10 scale).

The third investigated hypothesis

The last hypothesis assumes that many AIS graduates are working in Accounting and their activities are fully computerized.

In the beginning, the study detected whether respondents are employed (Table 5) and if so, how many of them are working in the field of Accounting (Table 6).

The current analysis aims to showing that in most cases, the employees, regardless the area in which they operate, use IT tools to solve their daily tasks at the workplace. Therefore, using the difference method as a research method, our study highlights that:

- 54.2% of AIS graduate students are employed (see Table 5);
- Among them 66.2 % work or have been worked in Accounting (Table 6);
- 87.7% of the AIS graduates that are employed in Accounting use specific software or IT tools in relation with their tasks at their workplace (Table 7).

Table 5: *Distribution of respondents by the employee status*

Are you currently employed?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	65	54.2	54.2	54.2
	No	55	45.8	45.8	100.0
	Total	120	100.0	100.0	

Table 6: *Distribution of respondents by the area they are employed*

Did you work or have worked in Accounting?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	43	66.2	66.2	66.2
	No	22	33.8	33.8	100.0
	Total	65	100.0	100.0	

Table 7: *Respondents distribution by the status of using software or IT tools at their workplace*

Do you use software or IT tools in your daily tasks?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	57	87.7	87.7	87.7
	No	8	12.3	12.3	100.0
	Total	65	100.0	100.0	

The survey results, using the concordance method, showed that 57 respondents, representing 87.7% of graduates working in the field of Accounting

are fully using within their activities accounting software or IT tools. Therefore, the third research hypothesis was confirmed.

Table 8. *The results of chi-square tests*

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3,345	1	,067		
Likelihood Ratio	3,148	1	,076		
Linear-by-Linear Association	3,294	1	,070		
N of Valid Cases	65				

In order for us to observe if there is a significant association between the use of software or IT tools and the field of work, we have performed a Chi-square test (Table 8). The results show a significant association between the two, at a significance level of 10%. Also, displays that more than 7% of the employed students are using (accounting) software or IT tools, and that more than 60% of the employed students work in Accounting and use specific software or IT tools during their daily tasks (Table 9).

Table 9. *The bivariate frequency table between the two variables*

Did you work or have worked in Accounting? * Do you use (accounting) software or IT tools in your daily tasks? Crosstabulation

		Do you use software or IT tools in your daily tasks?		Total
		Yes	No	
Did you work or have worked in Accounting?	Yes	Count 40	3	43
		% of Total 61,5%	4,6%	66,2%
No	Count 17	5	22	
	% of Total 26,2%	7,7%	33,8%	
Total	Count 57	8	65	
	% of Total 87,7%	12,3%	100,0%	

A more in-depth analysis confirmed that AIS graduates employed in IT field have less technical jobs, therefore we consider that most of them are more likely employable in the ERP industry, which is known for the fact that require less technical skills. Within the questionnaire, we have addressed some questions that have investigated the daily tasks and match them with the jobs requirements

of some of the job titles from the ERP industry. This way we have discovered that 32 of the respondents (out of 57), respectively 56.1% are daily using an ERP product and, based on their job requirements, could perform the tasks required by jobs like: ERP manager or team leader, ERP consultant, CRM/SCM manager or Project manager.

4. CONCLUSIONS AND FUTURE RESEARCH PATHS

Our research is based on our or other colleague's previous papers which investigated some aspects of the Iasi's IT market and the specific of the AIS programme study (Fotache, D., Hurbean, L., 2015; Fotache, M., et al, 2015; Fotache, D., Pavaloaia, V.D., 2015) and was developed on a sample from the country's N-E region. We consider the results may be extended for other regions, especially for graduates of prestigious Romanian universities due to the similarities in the educational curricula. Within our study, all the research hypotheses have been confirmed, namely: At least a quarter of the students that graduate the AIS programme work in the IT area (1); Less than half the students that graduate AIS programme work in the Accounting area (2); The students that graduated AIS programme make a full use of IT during their daily tasks (3). The research also points out that the graduates of AIS programme are willing to engage into a lifelong learning process and some of them are already employed on the IT market. Their profile reveals that they have an average age of 24 years, 50% of them have at most 6 months since the last employment, the majority did not get promotions or salary increases, their academic performance are above the average of the sample and for half of the subjects studied, 75% of the AIS graduates employed in the IT industry have grades of at least 8 (on a 10-1 scale).

We appreciate that the AIS study programme is a competency-based one, brings a strong knowledge foundation and intends to offer a realistic learning environment. However, the firm and well-structured knowledge foundation can be even more applied in real or simulated professional situations - the theoretical knowledge should increasingly be aligned with actual professional practice and priority in the learning process should be given to issues that come up in real-world situations.

In the last three semesters of the study programme features from professional environment are offered, which helps the transition to a real professional practice.

Some disciplines' assessment include projects which involve group work and thus enable students to develop generic communicative and collaborative skills. Therefore, based on this project-oriented approach and also on the fact that students have at their disposal dedicated Information Systems lab, a well-designed electronic learning environment and a substantial library of both hard copy and digital sources relevant to the IT domain, we consider that this programme might also produce IT employable graduates.

Adjustments may be implemented based on a curriculum redesign, so the learning outcomes to expand to guide the students to the IT industry. A number of improvements should be acted out and one easy measure is to offer students more elective courses.

A new vision may be created with the ambition for the AIS programme to become a recognized player in the IT industry field. Such an ambition should be translated to innovations in the curriculum and the courses syllabi. A new framework should put greater emphasis on competence-based learning outcomes, where competency is understood as the ability to coherently apply knowledge, skills, and attitude in professional practice.

The current research (as well as any other articles consulted) did not perform either a study on the rate of IT disciplines/Accounting discipline or an investigation on the number of hours allocated for each IT discipline delivered to the AIS undergraduate program. For instance, the ERP course has allocated one hour/week of practical training. On certain occasions, different generations of graduates reported that this situation is not conducive for their training as they need more practical hours. Also, the fact that students don't select the elective course on Databases, delivered in the 2nd year of study, truncate their professional preparation for this domain. The remarks of the employers on this issue should "give food for thought" to the tutors of the AIS undergraduate program. These latter matters are intended to be studied in a different article and we believe they represent the study limitation but, on an optimistic note, lead a way for further research aims.

We conclude by suggesting that, by upgrading the AIS curricula or by pursuing additional specialization courses, the AIS graduate students could easily address other specific areas of current technology offer (Mobile technologies, Business Intelligence/Business Analytics, Big Data, Cloud Computing, Social

networks, Software as a Service) completing the necessary knowledge to become a good and reliable professional, consistent with the requirements of employers of this decade.

BIBLIOGRAPHY

1. Dospinescu O., et al (2008), “Mobile enterprise resource planning: New technology horizons”, *Communications of the IBIMA*, no. (1) 11, 2008, pp. 91-97.
2. Ekman P. (2015), “The enterprise system revisited: how well does it capture the company’s business network?”, *Journal of Business & Industrial Marketing*, Vol. 30 Is. 2, pp. 208 – 217.
3. Fotache M., Dumitriu, F., Greavu-Serban V. (2015), “An Information Systems Master Programme in Romania. Some Commonalities and Specificities”, *Informatica Economică*, vol. 19, no. 3, 2015, pp. 5-17.
4. Fotache, D., Pavaloaia, V.D. (2015), “Enterprise Resource Planning’s Revolution for the “facelift” of Accounting Profession”, *Audit financiar*, Year XIII no.130 - 10/2015, pp.106-116.
5. Fotache D., Hurbean L. (2015), *Teamwork culture in Iasi IT companies*, Proceedings of the IE 2015 International Conference, București, May 2015
6. Glowalla P., Sunyaev A. (2014), “ERP system fit – an explorative task and data quality perspective”, *Journal of Enterprise Information Management*, Vol. 27 Is. 5, pp. 668 – 686.
7. Grubisic I. (2014), “ERP in clouds or still below”, *Journal of Systems and Information Technology*, Vol. 16, Is. 1, 2014, pp. 62 – 76.
8. Piazzolo F., Felderer M. (editors) (2013), *Novel Methods and Technologies for Enterprise Information Systems*, ERP Future 2013 Conference, Vienna: Springer Verlag.
9. Usman A., et al (2014), “Use of ERP systems: a social shaping perspective”, *MCIS 2014 Proceedings*, available at <http://aisel.aisnet.org/mcis2014/29/> [Accessed 09/08/2015].
10. Wortmann J.C., Peters K. (2014), “Future of ERP: Challenges and Opportunities in the SaaS-era”, *IFIP WG 5.7 International Conference*, Springer, available at http://link.springer.com/chapter/10.1007/978-3-662-44733-8_48 [Accessed 01/09/2015].
11. Yorke M. (2006), “Employability in higher education: what it is – what it is not”, available at http://www.employability.ed.ac.uk/documents/Staff/HEA-Employability_in_HE%28Is,IsNot%29.pdf [Accessed 21/09/2015].
12. Zhong F., Rohde M., M (2014), “Cloud Computing and ERP: A Framework of Promises and Challenges”, *Proceedings of the 25th Australasian Conference on Information Systems*, 2014, Auckland, New Zealand, available at <http://aut.researchgateway.ac.nz/handle/10292/8108> [Accessed 06/09/2015].