# Accepting Information Technology Changes in Universities - A Research Framework

Doina Danaiata(✉), Ana-Maria Negovan, and Luminita Hurbean

West University of Timisoara, V. Parvan 17, 69121 Timisoara, Romania
{doina.danaiata, luminita.hurbean}@e-uvt.ro,
ana_negovan@yahoo.com

**Abstract.** Contemporary academic environment demands for continuous improvement of managerial and educational performances in higher education institutions. In this context, choosing and implementing solutions which provide access to better services, aligning technological resources with university's mission and increasing data/information value is imperative. Romanian universities are faced with the need to implement Integrated Information Systems (IIS) which can ensure an improved way of doing their day to day activities and also provide informational support for managers. However, every implementation of integrated systems is challenging and puts to the test the skills of both managers and implementers. The critical success factors (CSF) have been studied extensively and we based our research on a vast body of literature. Based on the discovered characteristics we decided to combine the CSFs with the Technology Acceptance Model in order to define a specific model to evaluate and compare IIS implementation success in perspectives of managers and end-users.

**Keywords:** Change management · Integrated Information System (IIS)
End user perspective · Management perspective · Critical success factors

## 1 Introduction

Universities must adapt to competitive requirements of the environment where they operate. The favourable evolution of an academic institution essentially depends on the ability to update and integrate, customize and extent their information systems in flexible and rapid way, providing instantaneous, interactive and consistent access to information for all users.

Academic environment is undergoing rapid and remarkable changes due to the nature of the challenges it faces: information overload, competitiveness, uncertainty and possibility of organizational decline. According to [1, 2], the academic environment undergoes several major transformations:

1. Higher education becomes increasingly globalized.
2. Higher education system is developing the characteristics of a quasi-market.
3. Higher education is becoming a mass enterprise through the world.
4. Public funding has not kept up the expansion in student numbers.
5. Increasing state concern with quality.


G. C. Silaghi et al. (Eds.): IE 2016, LNBIP 273, pp. 55–69, 2018.
https://doi.org/10.1007/978-3-319-73459-0_4

6. Higher education curriculum is becoming more vocationally oriented.
7. Important changes have been done in the relations of industry and public universities.

Information systems allow universities to gather relevant information that is used for an improved management of educational curriculum and other related activities. Self- knowledge at institutional level is the starting point for ensuring educational programs of increased quality. Without an IIS that collects, processes, and delivers important information about all activities from a university, managers won't have an overview about what needs their attention and the results of their innovative practices.

According to the European Association for Quality Assurance in Higher Education (ENQA) an Integrated Information System (IIS) available in a university must provide information, at least, about the following:

- Student lifecycle and graduation rate;
- Employment level for graduates;
- Satisfaction level of students in relation with educational programs;
- Effectiveness of professors;
- Students profile;
- Available educational resources and associated costs;
- University performance indicators.

## 2 Integrated Information Systems in Universities - Theoretical Framework

A success factor for organizations in a dynamic and competitive environment is an IT strategy that supports business strategies and processes [3]. The way in which an organization uses IT strategy to achieve business performance contributes to creation of value and it represents a well know domain of study [3–7].

Aligning IT strategy with business strategy is crucial considering information technology has become a fundamental part of an organization used as a competitive asset [6]. In a 2001 article [8], Michael Porter affirmed that Internet influences operational effectiveness and strategic positioning in different ways. Internet based applications provide a new way of reaching out to the customers. IIS using Internet based interface facilitates access to the system by both university employees and stakeholders.

In developing a sustainable IT strategy, managers must consider that this will be a part of business strategy, reflecting how information technology supports processes and activities in reaching proposed objectives.

IIS provide required information for an effective organizational management [9]. IIS involve three main resources: technology, information and people. They are considered as a subset of internal control procedures in a business which covers all practical needs for people, documents, technologies [5, 10]. IIS can be a useful tool for collecting, analysing, evaluating, storing and disseminating information in decision making process [11].

A successful IIS must support an organization when an action plan has been defined and must provide required data for generating reports about critical performance aspects. Also, feedback will be available in order to determine what action to take depending on various aspects [12, 13].

IIS plays an important role in modern organizations, universities as well. At a global level more and more organizations choose to implement them [7, 14].

Information systems (IS) are an important part of an organization [29]. Without IS everyday tasks cannot be performed in an organization. For higher education institutions, IIS represents a key element for smooth running activities, decreasing considerably the workload and the time needed for accessing academic and economic information. In their paper the authors [28, 29] present a systematic way in which software applications spread information in an organization depending the right of access to information for each user type. In Fig. 1, we have adapted theoretical findings to higher education institutions specifics.

Information systems must respect a set of conditions in order to be considered as Integrated Information Systems [7, 16, 30–32], as follows:

- The information system must use a unique database which can be accessed by all users.
- The information system must gather under his umbrella all the activities performed in an organization.
- The information system must be protected by a complex security system.

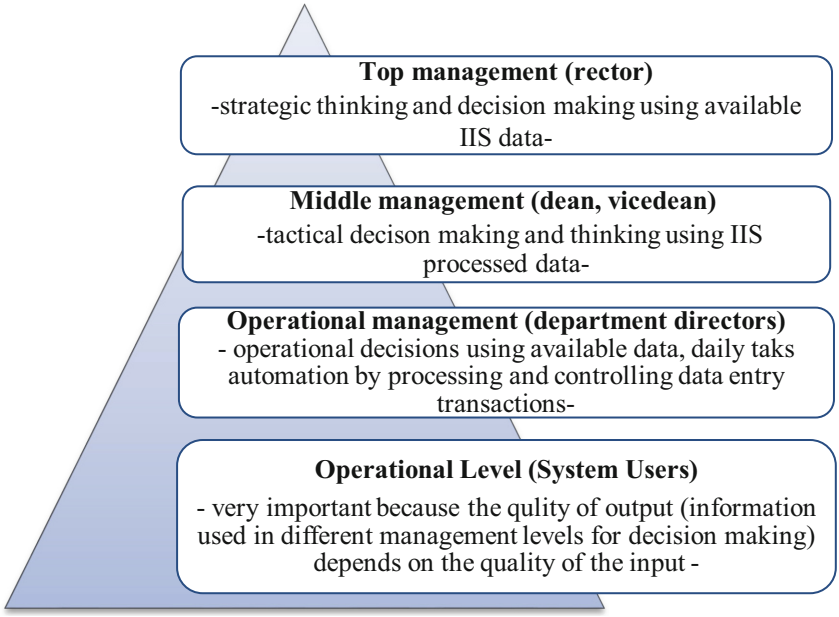


**Fig. 1.** Information importance depending on user's access.

### 2.1 Integrated Information Systems (IIS) Concept

In our literature review we have found many definitions for IIS (see Table 1). These were very different depending on the vision of the authors these were directed in different directions. Although, it is unanimously accepted that technology is essential in creating an information system. When defining IIS, the author must emphasize the functional areas for which IS was created: accounting, production, sales, supply chain, personnel and other.

**Table 1.** Definitions of IIS.

| Source | Year | Concept |
|---|---|---|
| [33] | 2014 | IIS represents a set of software modules that interconnect functional areas of an organization under a unique platform which will capture the informational flow. The dynamic of IT has allowed the development of IIS and barriers of time and space have been broken. Integration of software platform with other applications is possible, making the information available anywhere and anytime |
| [34] | 2014 | IIS are implemented in order to grow the level of competitiveness of an organization. The systems will grow with the organization itself, by covering all functional areas and collecting all relevant information |
| [7] | 2010 | IIS are client/server based systems which are developed to process transactions and facilitate the integration of all processes, from planning until production but also to enhance business relations with all partners |
| [35] | 2007 | IIS includes planning and managing all the resources of an organization in an efficient, productive and profitable way, by using configurable software packages |
| [30] | 2007 | IIS is an information system that integrates all the processes of an organization with the scope of creating value and decreasing costs by providing correct and timely information to appropriate audience in order to support decision making process for managing resources in a proactive and productive manner |
| [16] | 2006 | IIS are software packages that allow organizations to integrate business processes and all relevant information. IIS supports efficient resource management and provides a complete view over an organization by providing real time and accurate information |
| [36] | 2005 | IIS is an IT solution will provide a software package that covers all business processes and all areas of an organization or of a group of organizations |
| [37] | 2004 | IIS is a tool used for organization management which comprises of an integrated software package |
| [38] | 2002 | IIS is an approach to deliver a software that will support an organization by combing different computerized systems of functional areas and running them using a centralized database |
| [31] | 2001 | IIS comprises a set of software applications that support all key activities of an organization.<br>IIS - particulars:<br>Ease of access to data through the organization;<br>Way to determine and decrease costs.<br>Information support for improving process and resource management in an organization |

### 2.2 IIS for Higher Education Institutions

Considering information requirements found in European quality standards for higher education and trends for higher education institutions [39–41], but also the advantages and particularities of IIS, we can state that implementing an IIS in higher education institutions represents a way in which these organizations can align with quality requirements and to adapt to the dynamic environment in which these operate. Using IIS will increase the quality of information delivered to all stakeholders.

Using a unique database [31, 38] at university level will allow to obtain consistent and accurate data, by eliminating issues related to the use of standalone information systems like data redundancy and inconsistency. Depending on the modules that are implemented in higher education institutions and the functional area these cover, managers can access information at a click. Information which is crucial in decision making process. Moreover, IIS easily respond to reporting requirement defined at national level which have the scope of collecting unitary data about higher education institutions and system.

University's dynamic environment determine managers to keep up with stakeholder's requirements: from study programs to attracting possible students and retaining them. The degree in which a university can attract students could be improved by using information technology enhancements. IIS is a valuable asset for all universities and helps them adapt to ongoing changes.

IIS for universities must include general modules used for each domain of activity, but also specific modules used for higher education, like:

- Module for defining organization structure of a university: faculties and departments;
- Module for managing study programs;
- Module for student data management;
- Module for managing student related activities: taxes, diplomas, accommodation and others;
- Module/Interface which allow students to access information about their academic and/or economic situation.

## 3 Research Framework

The research aims to distinct samples: top and middle management and end-users. This allows a complete overview of IIS implementation. In general, top and middle managers have a complete image of what are the advantages of implementing of IIS and what they target.

The first aspect that this research aims to determine or evaluate is how top managers from Romanian universities have managed IIS implementation considering the following:

- Strategies, specifically IT Strategies, for information systems implementation;
- Relations between university strategies and adoption of an IIS;
- Change management at university level in the context of IIS adoption.

The second aspect that is targeted in our research is organizational change through the end-user perspective. The research model aims to collect information about IIS adoption in universities considering the perception of end-users over IT change, as follows:

- Change management for users: information, education and training programs and other measures undertaken to ease the transfer from the old legacy system to IIS.
- Top and middle management involvement in IIS implementation and supporting employees in transition period.

Both models were built considering the review and analysis of critical success factors (CSFs) for IIS implementation (see Table 2). Nevertheless, we consider that a smooth flow for IIS implementation must be supported by manager's involvement in all stages and at all levels, by implementation team efforts and delivered know-how, and not the last, by effective and efficient communication that targets end users in order to reduce and avoid resistance to change.

**Table 2.** List of critical success factors in IIS implementation

| Critical success factors in IIS implementation | Authors |
|---|---|
| Management of implementation project | [15–17] |
| Implementation team- composition and competence and how team work is done | [15–17] |
| Business Process Redesign and a minimum IIS customization | [15–19] |
| Effective communication and knowledge transfer | [15, 17–20] |
| Develop and test the new IIS, but also resolve related issues | [15, 17, 21] |
| End-user training | [18, 19, 21] |
| Change management programs | [15–17] |
| Support and involvement of top management | [15–20] |

### 3.1 IIS for Higher Education Institutions

The research model (Fig. 2) which aims to determine which factors impact the success of an IIS implementation from a managerial perspective was created from scratch considering CSFs for IIS implementation, as found in our literature review. On the other side, we have considered the main directions which determine an organizational behaviour in response to competitive environment and related trends, and their influences on strategic directions. From our point of view one of the most important factors are change management initiatives, because it is acknowledged in literature that people are inherently resistant to change, and avoiding or resisting change is human nature. [22]

User resistance to change reveals that inefficient communication is present between change initiators and employees. The latter try to maintain their status quo with undesirable behaviours toward change which are a response to management-imposed changes in job and work methods. [23]

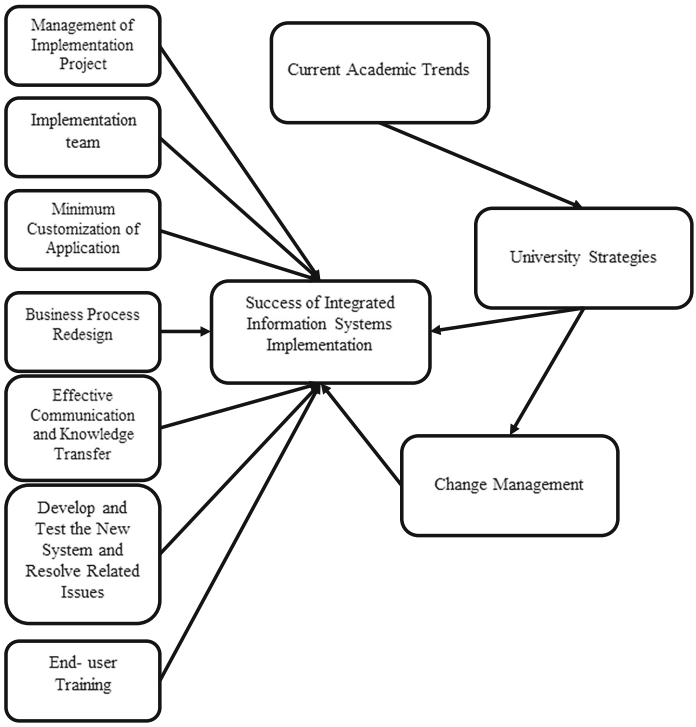


**Fig. 2.** Information importance depending on user's access.

The research hypotheses are:

*H1: The trends of academic environment influence the strategies of a university.*
*H2: The strategies adopted by a university strongly influence IIS successful implementations.*
*H3: The strategies adopted by a university strongly influence change management activities.*
*H4: Change management is a key successful factor in IIS implementations.*
*H5: A successful IIS implementation is influenced by several factors.*

*H5.a: A correctly managed IIS implementation is crucial for obtaining a successful outcome.*

*H5.b: Implementation team can have a significant impact on IIS implementation project.*

*H5.c: Business Process Redesign (Reengineering) and a minimum customization of ISS can strongly influence IIS implementation.*

*H5.d: Effective communication and knowledge transfer have a significant impact on implementation success.*

*H5.e: Development and test of new IIS and resolving correctly and on time related issues have a significant impact over successful outcome.*
*H5.f: End user training can significantly increase the success rate of IIS implementations.*

*H6: The success of an IIS implementation depends on demographic factors, like age, gender, level of studies, professional and educational profile, and experience.*

The research form is available on Google Forms (https://goo.gl/8yXEPb) and it is an ongoing study. Until now, answers were collected from several universities in Romania. Answers were collected from managers in 6 universities (see Table 3).

**Table 3.** Manager's Responses by Universities

| University | Response rate (% from total responses) |
|---|---|
| A.I. Cuza University Iasi | 53.33% |
| Academy of Economic Studies Bucharest | 3.33% |
| Babes Bolyai University Cluj | 13.33% |
| University from Craiova | 10.00% |
| Lucian Blaga University Sibiu | 3.33% |
| West University Timisoara | 16.67% |

Preliminary findings about the stage of information system implementation in Romanian higher education institutions are presented in the Table 4. Over 95% of respondents' state that information systems are used in universities in order to collect relevant information. All universities from our study use IIS (over 50%), but also other software that responds to different specific requirements (almost 40%).

**Table 4.** Information Systems used in Universities

| Type of IS used | Responses (% from total) |
|---|---|
| Stand-alone information system | 39.29% |
| Integrated Information System | 57.14% |
| Manual solution with IT support | 3.57% |

Correlating the types of information systems used in universities and the stage of their implementation (Table 5) we have found the following:

– 40% of our respondents said that the implementation of an Integrated Information System was successfully completed over a year ago and they are using the system. While only 3.5% said the system is not used anymore and 14% said that they are in the implementation of IIS is in progress.

– Almost 30% of the respondents said that they are using stand-alone application in their universities and these were implemented over a year ago, while just 10% said that they are in the process of implementing an information system.
– Only 3.5% said that they are using systems that require manual tasks in order to collect, analyse and deliver correct information.

**Table 5.** Situation of IS Implementation in Romanian Universities

| | Stage of IS implementation | | | | |
|---|---|---|---|---|---|
| Type of information systems | In progress | Was done over 1 to 3 years ago | Was done over 3 to 5 years ago | Was done over 5 years ago | Was done but the system is not used anymore |
| Stand-alone information system | 10.71% | 7.14% | 3.57% | 17.86% | 0.00% |
| Integrated Information System | 14.29% | 21.43% | 7.14% | 10.71% | 3.57% |
| Manual solution with IT support | 3.57% | 0.00% | 0.00% | 0.00% | 0.00% |

### 3.2 Research Model for End User Perspective on IIS Implementation

The term acceptance is used by authors with different backgrounds and approaches. In fact, in the literature, acceptance does not have a unique definition. TAM [24] describes acceptance as users' decision about how and when they will use technology. [25] When faced with such a major change in an organization you find out that there are several constraints related to the ability to take action in several situations, to the organization and the business environment, to different habits.

New technologies are complex and uncertainty elements exist in decision making for successful implementation, because people create their own attitude and intentions toward using of new technologies. [26].

The model first proposed by Davis [24] was successfully used in different research domains. It was modified to better suit research needs by introducing several other variables which could have an impact on ease of use, usefulness and behavioural intentions.

For the research which aims to quantify managerial perspectives we will use TAM 2 which was published in the article by Venkatesh and Davis [27]. The constructors present in the original model are presented in Table 6, as described by Venkatesh and Davis (2000).

**Table 6.** Constructors' description

| Constructor | Details |
|---|---|
| Experience | How the user's experience in his domain influences the way he perceives the new system |
| Availability | The degree in which the possible users feel like the decision for adopting the new system is not mandatory |
| Subjective norms | The person's perception that most people who are important to him think he should or should not perform the behaviour in question |
| Image | The degree in which the use of an innovation is perceived as a way to increase a person's status |
| Job relevance | The person's perception on relevance level of the new system for their job and related activities |
| Output quality | The degree in which the new system will support the end user in their daily activities |
| Result tangibility | The way in which final result obtained using the system are perceived |
| Perceived utility | The degree to which a person believes that using a particular system would enhance his or her job performance |
| Perceived ease of use | The degree to which a person believes that using a particular system would enhance his or her job performance |
| Behavioural intention | The degree in which a person has created or not an action plan towards a future behaviour |
| Behaviour in use | Positive or negative attitude of a person related to a certain intention |

Using TAM 2 as a starting point we have added the critical success factors for IIS implementation (see Fig. 3).

The research hypotheses developed based on the research model are the following:

*H1: The involvement of university's management has a strong impact on an end user perception on using an IIS.*

*H1.a: Top management support for end users in understanding the usefulness of IIS implementation is crucial.*

*H1.b: Top management implication strongly influences behavioural intentions of end users.*

*H1.c: Top management implication strongly influences behaviour in use of end users.*

*H1.d: Change management activities impact the perception of end users towards IIS usefulness.*

*H1.e: Change management activities impact the behavioural intentions of end users towards IIS.*

*H1.f: Change management activities impact the behaviour in use of end users towards IIS.*

*H2: Critical success factors for IIS implementations have a strong influence on perceived usefulness and utility, but also over behavioural intentions and behaviour in use.*

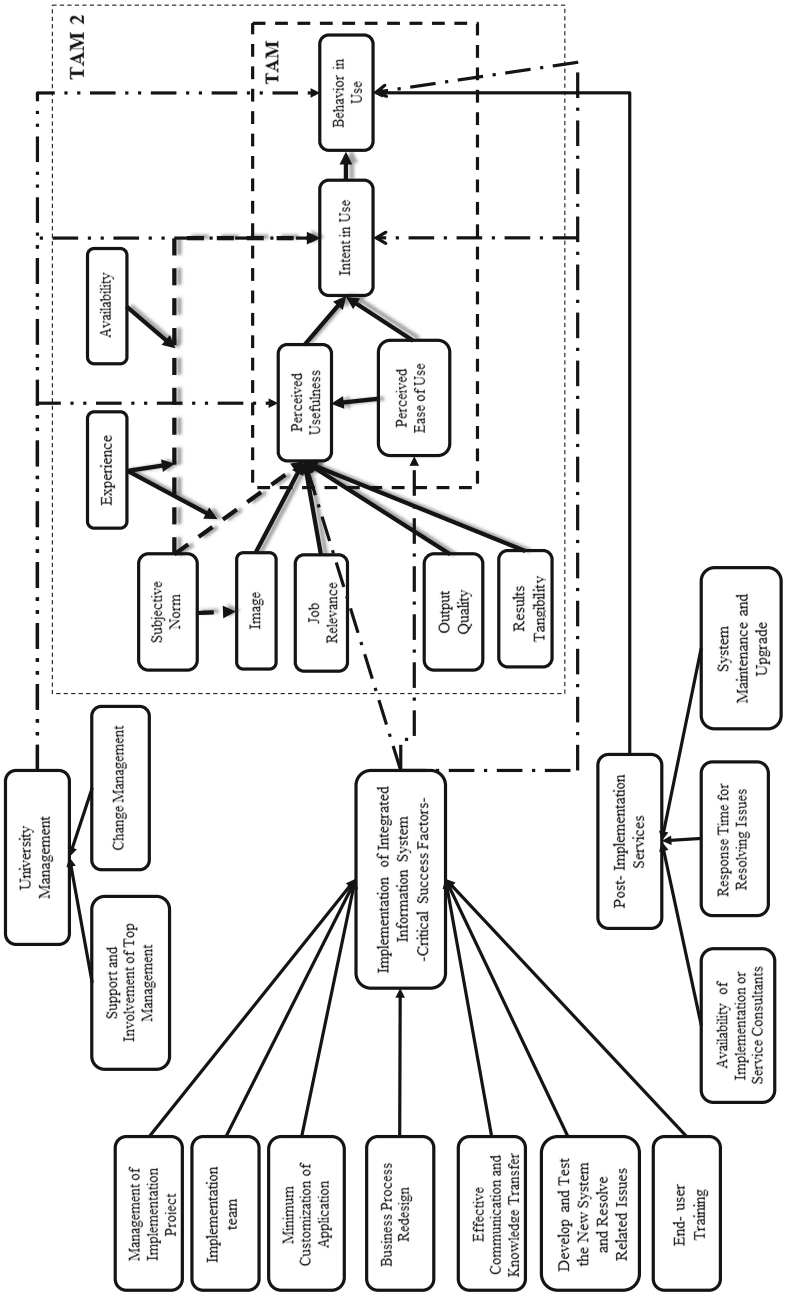


**Fig. 3.** Research framework for university's' end-user perspective- and adaptation of TAM2 including Critical Success Factors for Integrated Information System Implementation.

*H3: The management of the implementation project has a strong influence over perceived usefulness and utility, but also over behavioural intentions and behaviour in use.*
*H4: The implementation teams, their composition and competences, and how they work together as a team influence the end user's perception on usefulness and utility, but also his/her behavioural intentions and behaviour in use.*
*H5: Business Process Redesign (Reengineering) and a minimum customization influence the end user's perception on usefulness and utility, but also his/her behavioural intentions and behaviour in use.*
*H6: Effective communication and knowledge transfer have a strong impact on end user's perception on usefulness and utility, but also his behavioural intentions and behaviour in use.*
*H7: Development and test of new IIS and resolving correctly and on time related issues influence the end user's perception on usefulness and utility, but also his/her behavioural intentions and behaviour in use.*
*H8: Training programs and how these are done influence the end user's perception on usefulness and utility, but also his/her behavioural intentions and behaviour in use.*
*H9: Subjective norms have a strong impact on the end user's perception of image, usefulness and behavioural intentions.*
*H10: Image is a key factor that influences the end user's perception on IIS usefulness.*
*H11: Job relevance is a key factor that influences the end user's perception on IIS usefulness.*
*H12: Output quality is a key factor that influences the end user's perception on IIS usefulness.*
*H13: Results tangibility is a key factor that influences the end user's perception on IIS usefulness.*
*H14: Experience is a key factor that influences the end user's perception on IIS usefulness and behavioural intentions.*
*H15: Availability is a key factor that influences the end user's behavioural intentions.*
*H16: Perceived ease of use has a strong impact on end user's perception over IIS usefulness and behavioural intentions.*
*H17: Perceived usefulness has a strong impact on end user's behavioural intentions.*
*H18: Behavioural intentions have a strong impact on behaviour in use.*
*H19: Post implementation services (availability of IIS consultant, response time for resolving different situations, maintenance and upgrade of IIS) have a strong impact on behaviour in use of IIS end user's.*
*H20: Does the success of an IIS implementation depend on demographic factors, like age, gender, level of studies, professional and educational profile, experience or others?*

Answers from end-users are collected using a questionnaire created in Google Forms (https://goo.gl/Je081u). We have tested some of our hypothesis in previous

research papers, the research framework presented here being an improved and more comprehensive one.

Our research was done in several Romanian universities and the response rate in presented in Table 7. The two universities with the highest response rate are from Timisoara and Iasi, which have Integrated Information Systems already implemented.

**Table 7.** End-user's Responses by University

| University | Response rate (% from total responses) |
|---|---|
| West University Timisoara | 26.19% |
| A.I. Cuza University Iasi | 57.14% |
| Babes Bolyai University Cluj | 9.52% |
| Politechnic Institute Cluj-Napoca | 2.38% |
| University from Craiova | 2.38% |
| Academy of Economic Studies Bucharest | 2.38% |

The findings related to IS implementation stage (Table 8) showed that 40% have implemented the system over 5 years ago, while the same situation we encounter for implementations completed over 1 year ago up to 5 years, only 5% being completed in the last year and 15% are in progress implementations. More important is that we have skilled and experienced end-users. This will relate to improved quality of data entry and of information output.

**Table 8.** Years of end-user experience versus IS implementation stage

| | Years of experience and system usage | | | | | |
|---|---|---|---|---|---|---|
| Period since IS implementation | Up to 6 months | 6 months up to 1 year | 1 to 2 years | 2 to 3 years | 3 to 5 years | Over 5 years |
| Within last year | 0.00% | 0.00% | 0.00% | 4.76% | 0.00% | 0.00% |
| 1 to 3 years ago | 2.38% | 0.00% | 2.38% | 2.38% | 2.38% | 2.38% |
| 3 to 5 years ago | 0.00% | 0.00% | 0.00% | 0.00% | 14.29% | 9.52% |
| Over 5 years ago | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 42.86% |

## 4 Conclusions

Although ERP implementation in universities is often described as difficult, costly and risky and sometimes has been considered failed or ineffective, its adoption in this sector has continued. We witnessed a large research effort of understanding the phenomenon of ERP (IIS) adoption and evaluation in universities. The study findings confirm the unique nature of IIS adoption in universities and summarise influences on ERP implementation, having in mind the two major perspectives: top management and end-users.

From our previous researches we found that the most important factors in IIS implementations are users and their perception of the change process [7]. This is why the current research took two directions; the first one aims to determine how top

managers from Romanian universities perceived the IIS implementation and the second one focuses on end user's acceptance of the new information system.

Using TAM 2 and the set of CSFs for IIS implementation, we have developed two particular/customized research models for the two mentioned categories. This paper presents also a set of hypothesis for both approaches that we aim to validate in the following steps of the present research.

## References

1. Knight, P.T., Trowler, P.R.: Departmental Leadership in Higher Education. The Society for Research in Higher Education and Open University Press, Buckingham (2001)
2. Xianming, X.: Academic management and administration system reform in higher education institutions. Front. Educ. China **1**, 70–78 (2006)
3. Henderson, J., Venkatraman, N.: Strategic alignment: leveraging information technology for transforming organizations. IBM Syst. J. **32**, 472–484 (1993)
4. Luftman, J.N., Lewis, P.R., Oldach, S.H.: Transforming the enterprise: the alignment of business and information technology strategies. IBM Syst. J. **32**(1), 198–221 (1993)
5. Kerimoglu, O., Basoglu, N., Daim, T.: Organizational adoption of information technologies: case of ERP systems. J. High Technol. Manag. Res. **19**, 21–35 (2008)
6. Al Majali, D., Dahlin, Z.: Diagnosing the gap in IT - business strategic alignment: a qualitative analysis among public shareholding firms in Jordan. Int. J. Electron. Bus. Manag. **8**(4), 263–271 (2010)
7. Fotache, D., Hurbean, L., Dospinescu, O., Pavaloaia, V.D.: Procese organizaţionale şi integrare informaţională - Enterprise Resource Planning. Editura Universităţii "Alexandru Ioan Cuza", Iaşi (2010)
8. Porter, M.: Strategy and the Internet. Harvard Bus. Rev. **79**(3), 62–78 (2001)
9. O'Brien, J.: Management Information Systems. Irwin McGraw-Hill, Boston (1999)
10. O'Connor, N., Martinsons, M.: Management of information systems: insights from accounting research. Inf. Manag. **43**, 1014–1024 (2006)
11. Lecuit, L., Elder, J., Hurtado, C., Rantrua, F., Siblini, K., Tovo, M.: Demystifying MIS-Guidelines for Management Information Systems in Social Funds. Technical paper no. 443. World Bank, Washington D.C. (1999)
12. Wagner, C.: Enterprise strategy management systems: current and next generation. J. Strateg. Inf. Syst. **13**, 105–128 (2004)
13. Nasir, S.: The development, change, and transformation of management information systems. Bus. Market. J. **25**, 442–457 (2005)
14. Grabski, S.V., Leech, S.A., Schmidt, P.J.: A review of ERP research: a future agenda for accounting information systems. J. Inf. Syst. **25**(1), 37–78 (2011)
15. Nah, F., Lau, J., Kuang, J.: Critical factors for successful implementation of enterprise systems. Bus. Process Manag. J. **7**(3), 285–296 (2001)
16. Nah, F., Delgado, S.: Critical success factors for enterprise resource planning implementation and upgrade. J. Comput. Inf. Syst. **46**(5), 99–113 (2006)
17. Francoise, O., Bourgault, M., Pellerin, R.: ERP implementation through critical success factors' management. Bus. Process Manag. J. **15**(3), 371–394 (2009)
18. Muscatello, J.R., Chen, I.J.: Enterprise resource planning implementations: theory and practice. Int. J. Enterp. Inf. Syst. **4**(1), 63–77 (2008)
19. Stratman, J.K., Roth, A.V.: Enterprise resource planning competence constructs: two-stage multi-item scale development and validation. Decis. Sci. **33**(4), 601–628 (2002)

20. Maditinos, D., Chatzoudes, D., Tsairidis, C.: Factors affecting ERP system implementation effectiveness. J. Enterp. Inf. Manag. **25**(1), 60–78 (2012)
21. Gargeya, V.B., Brady, C.: Success and failure factors of adopting SAP in ERP system implementation. Bus. Process Manag. J. **11**(5), 501–516 (2005)
22. Bovey, W., Hede, A.: Resistance to organizational change: the role of cognitive and affective processes. Leadersh. Org. Dev. J. **22**(8), 372–382 (2001)
23. Piderit, S.: Rethinking resistance and recognizing ambivalence: a multidimensional view of attitudes toward an organizational change. Acad. Manag. Rev. **25**(4), 783–794 (2000)
24. Davis, F.D.: Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q. **13**, 319–339 (1989)
25. Negovan, A.M., Danaiata, D., Hurbean, L.: Using technology acceptance model for managing IT changes in universities. In: Proceedings of the 7th International Conference Management of Technological Changes, Alexandropoulos, Greece (2011)
26. Davis, F.D., Bagozzi, R.P., Warshaw, P.R.: User acceptance of computer technology: a comparison of two theoretical models. Manag. Sci. **35**(8), 982–1003 (1989)
27. Venkatesh, V., Davis, F.D.: A theoretical extension of the technology acceptance model: four longitudinal field studies. Manag. Sci. **46**(2), 186–204 (2000)
28. Chaffey, D., Bocij, P., Greasley, A., Hickie, S.: Business Information System, Technology, Development & Managemnt for the E-Business, 3rd edn. Pearson Prentice Hall, Harlow (2006)
29. Laudon, K.C., Laudon, J.P.: Management Information Systems: Managing the Digital Firm, 10th edn. Pearson Prentice Hall, Upper Saddle River (2007)
30. McGaughey, R.E., Gunasekaran, A.: Enterprise Resource Planning (ERP): Past, Present and Future, pp. 23–35. IGI Global, Hershey (2007)
31. Aladwani, A.M.: Change management strategies for successful ERP implementation. Bus. Process Manag. J. **7**(3), 266–275 (2001)
32. Marnewick, C., Labuschagne, L.: A conceptual model for enterprise resource planning (ERP). Inf. Manag. Comput. Secur. **13**(2), 144–155 (2005)
33. Beheshti, H.M., Blaylock, B.K., Henderson, D.A., Lollar, J.G.: Selection and critical success factors in successful ERP implementation. Compet. Rev. **24**(4), 357–375 (2014)
34. Al-Ghofaili, A.A., Al-Mashari, M.A.: ERP system adoption traditional ERP systems vs. cloud-based ERP systems. In: Fourth International Conference on Innovative Computing Technology (INTECH), pp. 135–139 (2014)
35. Laukkanen, S., Sarpola, S., Hallikainen, P.: ERP system adoption - does the size matter? In: Presented at International Conference on System Sciences, Hawaii (2005)
36. McAdam, R., Galloway, A.: Enterprise resource planning and organisational innovation: a management perspective. Ind. Manag. Data Syst. **105**(3), 280–290 (2005)
37. Shehab, E.M., Sharp, M.W., Supramaniam, L., Spedding, T.A.: Enterprise resource planning: an integrative review. Bus. Process Manag. J. **10**(4), 359–386 (2004)
38. Payne, W.: The time for ERP? Work Study **51**(2), 91–93 (2002)
39. Projects co-financed by European Social Fund for POSDRU 2007–2013, Quality and Leadership for Higher Education in Romania, Vision- Higher Education in Romania in 2015, 20 June 2011
40. Projects co-financed by European Social Fund for POSDRU 2007–2013, Quality and Leadership for Higher Education in Romania, Green Book: To Quality and Leadership in Romania's Higher Education in 2015 (2011). Andreescu, L., Curaj, A., Zulean, M.
41. Projects co-financed by European Social Fund for POSDRU 2007–2013, Quality and Leadership for Higher Education in Romania, White Book for Quality and Leadership in Romania's Higher Education in 2015, ISBN 978-973-0-11850-6