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Using Internship Management System to Improve the Relationship between Internship Seekers, Employers and Educational Institutions

Hyrmet Mydyti
SEE University, North Macedonia
Arbana Kadriu
SEE University, North Macedonia

Abstract

This paper aims to research demands and practices on internships. The internship management system (IMS) is a fundamental fragment of communication between students, educational institutions and businesses (S-B-A) and is an influential tool to improve the digitization of processes related to internships. The Internship Management System (IMS) will ease many processes between the counterparts. Internships will ease the process of discovering talents fitting the internal culture of the companies and increasing the companies' productivity. Moreover, the internships will assist educational institutions being market-oriented by making students before their graduation to be better informed with the requests of the market and being aware of their skills and abilities. In this paper, we have given different perspectives and approaches on practices of internships, design patterns and frameworks on reinforcing the communication between the three above-mentioned pillars (S-B-A). Questionnaire surveys have been used as a methodology for conducting this research. Businesses have been the subject of the study and the obtained information provides a better observation of the study.

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Introduction

Nowadays, it has become highly important to attend an internship because it ultimately increases the chances to find a job after graduation and to easily fit in the market. Educational institutions have goals and interests to create opportunities for their students to easily penetrate the market. Educational institutions through internships will ease the process of informing students with requests of the market and making them aware of their skills and abilities. Companies/businesses offer practical skills and experience opportunities for students. Companies/businesses through internships will ease the process of discovering talents fitting the internal culture of the company/business and increasing the entity's productivity. The educational institutions and the companies/businesses have a common aim to offer internships for students as an opportunity in increasing the chances to compete for jobs.

The issue of a system offering linkages between these three pillars (S-B-A) has resulted to be highly important for this research. Because of the absence of an internship management system (IMS), the linkage of the three pillars (S-B-A) is difficult and it is time-consuming. IMS is a tool to alleviate the process in exploring and seeking professional learning experience, especially for the students, to enhance the process of bringing new energies, as well as in developing and in discovering talents that fit the internal culture of the company/business. The outcome benefits include a reduction in time and effort.

This paper also describes the research methodology in understanding the needs of the market and best-suited implementations of design patterns and frameworks of IMSs. This IMS is a bridge between internship seekers, employers, and professors.

The rest of this paper is organized as follows. Section 1 introduces the study, its problem statement, research objectives and research questions. Section 2 has been divided into three sections based on the topic of the related work as a) the internship as a facilitator, b) design patterns and c) web technologies and frameworks. Section 3 provides a detailed research methodology, research design, sampling and instruments, analysis, and findings and survey results. Section 4 provides the conclusion of the study.

Problem Statement

Actual communication is time-consuming and improper since the way of communication is not a centralized system, business-oriented and student-oriented. In the context and the region where we live, we do not offer a good communication environment for pillars (S-B-A) due to the lack of an IMS.

The lack of an IMS has many disadvantages; as a result, the businesses/companies use different sources to find an intern. Educational institutions do not have any system to ease the processes of internship application and attendance. Thus, the purpose of this study is to overcome some of the obstacles because of the lack of a centralized management system in the context of internships.

Research Objectives

The main goal of this paper is to study the expectation of businesses, students, and universities towards an IMS. The objectives of the paper are as follows:

- To identify important factors towards the expectation of a web-based IMS.
- To study different perspectives on an IMS.
- To determine the reliability of the system by selecting the best trends and technologies.
- To strengthen linkages between S-B-A.

Research Questions

This study poses the following main research questions:

- What challenges are faced by the three parties concerned, i.e. students, institutions and employers? What are the challenges that we consider as solvable or difficult to overcome, and how can we strategize effective solutions?
- How to analyse and design the systems that can improve the management of the internship? Which trends and technologies can influence an IMS?

Related Work

There is extensive literature regarding the set-up of very complex and structured applications with design patterns. This paper selected research papers that are related to an internship as a facilitator and various design patterns, frameworks and web technologies in the implementation of IMSs.

Internship as Facilitator and Bridge

A program to enhance the collaboration between industry and university is presented and solutions in solving problems are given. The process in checking the progress and status of each student is considered difficult, the short internships for the students are considered a problem and in finding the proper real field problems by the University is considered a problem. Internship & Capstone Integrated program allows students to experience real problems in advance before graduation. Students, by attending ICIP, are provided with the chance to complete research in various fields and the chance to learn how to create a business case to fund their project. The beneficiary of the project is an industry by obtaining solutions to their problems and being provided with a better understanding by students and educational institutions. The next beneficiary of the project is educational institutions by building a relationship with Industry and gain insights from industry on education system (Shin et al., 2013). Moreover, another perspective on Capstone Projects is given (Steele & Cleland, 2015).

The strong interrelationship between industry and education and research in universities is demonstrated. The involvement of industry in curriculum design, the attendance of short courses in university by providing applied research opportunities, and the intertwining of the academic education with the industry practices are the key elements towards the establishment and the strengthening of linkages between university and industry. It is moreover highlighted that the engagement of the students in industry, during the studies, directly affects the students' achievements. It recommends more opportunities for interaction between students and industry and academic staff and it recommends the development of ongoing relationships. It evinces, by taking into account the industry's views, the achievement of potential benefits associated with strengthening the industry linkages. In this context, this study provided an opportunity to gain input from ICT professionals across a broad range of organizations. It is considered an opportunity to strengthen linkages by the accreditation of courses, which provides an opportunity for industry associations and professional bodies in the provision of valuable input into the curriculum. The next role leading to strengthening the linkages is by offering curriculum and content advice, guest lectures, and support in obtaining student projects and sites for internships (McGill et al., 2015).

Design Patterns

Design patterns are a trend in software development. In this section, attractive papers have been included:

How design patterns can be used for data structures implementation is mainly analysed and the advantages of design patterns are presented. The behavioural, structural and creational aspects of patterns are presented. With the new perspective on design pattern, it can provide separation between concepts, re-usability, storage, independence is highlighted, and others. In case of designing complex object-oriented systems, it illustrates how the implementation is being relied on composite objects along with class-based inheritance. Besides, the behavioural patterns are classified, one of many patterns, for better communication and interaction, dynamic interfaces, object composition, and object dependency. Models of data structures that apply the behavioural design patterns include Iterator, Template Method, Visitor, Strategy, Comparator, and State. Structural patterns classify for the better composition of classes and objects into larger structures. Models of data structures that apply the structural design patterns include Flyweight, Bridge, Adapter, Decorator, and Composite. Creational patterns classify for better instantiation, abstract behaviour, and hide instantiation and composition details. Models of data structures that apply the creational design patterns include Abstract, Factory, Singleton, and Builder (Niculescu, 2012). Moreover, the study is extended by classifying patterns, giving challenges, addressing issues, trends, and a new approach and directions on design patterns are given (Eskca et al., 2014; Hussain et al., 2017; Manev & Maneva, 2014; Mouratidou et al., 2007; Pavlič et al., 2016; Rouhi & Zamani, 2016).

A very substantial comparison of design patterns and evaluation, in the context of usage, categories, and key elements of design patters is. They consider that implementation of design patterns in web application offers reusability, consistency and flexibility, and much more as speed, scalability, and security. The comparison of categories of design patterns is grouped as creational, offering flexibility, structural, offering inheritance and behavioural patterns, offering communication between objects. This study elaborated well the circumstances of the selection of appropriate design patterns. Best practices of design patterns are also a gainful topic, more precisely best practices of Creational Design Pattern, Behavioural Design Pattern, and Structural Design Pattern. Besides, by comparing the best approach of design patterns, between MVC, Factory and abstract, MVC is considered as the most popular approach in web-based application development for its reusability, flexibility, easiness, and manageability (Hameed et al., 2014).

Frameworks, Web Technologies in implementation of IMS

How the developing mode of Web application based on MVC pattern overcomes (or overcame), the traditional development model is discussed. The current development status of IMS is analysed by describing details of the user requirements and functional structure and the user-centred interaction design issues in the application. With the system proposed and implemented, it incorporates the practice management process and the practice teaching system; the algorithm is described where it considers performance optimization and convenience of using to the whole process. As for the tools and techniques, in this system, Java as a programming language and SQL as Database has been used (Xue, 2015).

A web-based internship information system is designed by using the Design Science Research Method(s) (DSRM), to collect data. PHP, Bootstrap, CSS, HTML, JavaScript, MySQL database, and Apache web server are technologies used to

develop this system. The results of the research assure that the system can be used as support for the internship program. As for our research interest, internships as a program show the enhancement of the relationship between school and workplaces, and internship information system results as a facilitator guidance process between students, teachers, and coordinators (Yannuar et al., 2018).

A web-based dynamic platform is elaborated that digitized many processes for the students, lecturers, and industry-based supervisors to find and attend an internship (work experience). Supervisors will assign immediately the students to begin their industrial training and ease their monitoring in real-time. The web-based platform enhances the manual tasks of activities such as registration, dissemination of information, filling the logbook for students' day-to-day activities and supervision/assessment by lecturers and industry-based supervisors. PHP, CSS, HTML, JavaScript, MySQL database and Apache web server are technologies used to develop this system (Adetiba et al., 2012).

In creating a web-based e-Portfolio is resulted, which facilitates students in documenting the results of their work and aids supervisors in monitoring the process during the internship. The research instrument used in this research is a questionnaire and showed that e-portfolio features can be used according to the users' needs. E-portfolio is recommended to be used to overcome the issues and its features are useful in providing an effective means of consulting (Juhana et al., 2018).

Methodology

Empirical methodologies have been used to conduct this research. Questionnaire surveys were conducted to benefit from a highly diverse sample of respondents: businesses/companies from three different countries – Kosovo, North Macedonia and Albania – are the subject of this study. The data of this study was obtained by distributing the self-completed questionnaires to respondents, through social and professional networks. Probability and simple random sampling techniques were implemented for the selection of samples for each simple random. In our research, simple random sampling has been used as a sampling technique where every business, regardless of its size, has the chance of being selected in the sample. Table 1 below shows the calculation of this selection.

Table 1
The calculation for Sample Selection (Simple random)

	Business Size			
	Micro-sized	**Small-sized**	**Medium-sized**	**Large-sized**
Number of the businesses	61	17	10	12
The proportion of the sample	$\frac{61}{100} \sim 61\%$	$\frac{17}{100} \sim 17\%$	$\frac{10}{100} \sim 10\%$	$\frac{12}{100} \sim 12\%$

Source: Authors' work

The table above shows that about 61.00% of respondents belong to a micro-sized business, 17.00% of respondents are small-sized businesses, 10.00% of respondents are medium-sized businesses and 12.00% are large-sized businesses.

Results

Survey Results Summary

Our results revealed that the businesses who employ interns come from various industries. Businesses often employ interns and have adequate feedback on internship processes, as well as report on various challenges, such as supervision and/or lack of interns, intern retribution, and others. Digital mediums are used as a source to find interns, and a web-based internship portal is welcomed by the businesses. However, an in-person interview is the preferred method of interviewing an intern. There is an equal business need for full-time and half time interns, and the businesses' need for employment of interns for both summer and winter seasons. Interns are showing interest in attending an internship, and the current situation of the internship process is mostly in an average/fair satisfaction level. Preferences for intern education are diverse, as well as diverse valuable technical skills, which are very important besides the theoretical knowledge. Finally, finally, yet importantly, the language competences are highly important.

Role of the web portal

Most of the respondents responded in favour of the need for an IMS (87%). The rest of the respondents answered by saying there was not such a need (10.00%) and a small portion chose maybe (3.00%) in terms of the need for an IMS.

We used the survey data to analyse the relationship between the size of businesses and the need for a web-portal. We performed analysis and tests as linear regression with Stata, statistical software for data science. We conducted this analysis between these two variables based on 100 observations.

We conducted a linear regression analysis to predict the need for a web-portal variable based on the size of the business variable. Based on linear regression analysis, the regression equation can be written as:

$$N = 1.001 + 0.0924\ B \quad (2)$$

For every unit increase in the Business Size (B), the need for internship web portal (N) increases by 0.0924 units while keeping all other factors constant.

The **Prob> F** value (0.0268) is less than 0.05 indicating a relationship between the set 'business size' and the 'need for web-portal' variables. The value Prob > F-value is the p-value for the goodness-of-fit test, which tests the null hypothesis that all of the model coefficients are 0.

R squared is 0.0490, which shows that the 'business size' variable included in the model can explain 49% of the variation in the dependent variable. Based on the R-squared value, the overall strength between the business size and the need for an IMS is measured.

The **P-value** (0.027) is less than the significance level (0.05), which indicates that our results are statistically significant. The coefficient has a statistically significant impact on the need for an IMS variable.

We are 95% confident that the 'business size' variable has some effect on the need for an internship web portal variable.

Statistic, t, is 2.25 for the coefficient of business size, highly significant. We can say that the 'business size' variable has a statistically significant effect on the need for an internship web portal.

Table 2
Distribution of enterprises according to the need for web portal

Business Size	Need for Web portal	Need for Web portal
	Yes	No/Maybe
Micro-sized enterprise	90.16 %	9.84 %
Small-sized enterprise	100.00 %	0.00 %
Medium-sized enterprise	50.00 %	50.00 %
Large-sized enterprise	83.30 %	16.70 %
Total	**87.00 %**	**13.00 %**

Source: Authors' work (2019)

Table 2 presents the distribution of enterprises according to the need for web portal. All small-sized enterprises responded in favour of the need for an IMS (100%). Most of the small-sized enterprises (90.16%) and large-sized enterprises (83.3%) responded in favour of the need for an IMS. Finally, half of the medium-sized enterprises (50%) responded in favour of the need for an IMS.

Businesses, in general, are expressing interest in having an IMS. Given the dense concentration of a need for an internship of a web-portal by businesses, it proves that an IMS can provide solutions to many questions raised in this survey. Businesses answered the question regarding their expectations towards a web-based IMS.

Conclusion

In this paper, we have discussed the role of the IMS. A web-based platform is being proposed and recommended by implementing the principles of an MVC pattern-based framework for Web application software systems. PHP, CSS, Bootstrap, HTML, JavaScript, JQuery, Ajax, MySQL database and Apache web server are technologies mostly used to develop such system. The main characteristics that the system is offering are loose coupling, simplicity in code development code, maintainability, and extensibility. The management system is expected to be able to reduce manual processes and be a beneficial tool for all parties for a better communication environment. Students will be one of the key beneficiaries of the IMS besides the educational institutions (public and private) and businesses/companies. The results of the empirical study also support these statements.

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About the authors

Hyrmet Mydyti holds a 5-year degree in Electrical Engineering - Telecommunications and Computer Sciences from the Public University of Prishtina, a Master's degree in Software and Application Development from the SEE University and she is currently attending PhD studies at the SEE University in Computer Sciences. She has many years of work experience as a Digitalization Manager, a Database Manager, a Director of the Energy Supply Division, an IT Expert and as a Roaming Engineer. The author can be contacted at **hm28315@seeu.edu.mk.**

Arbana Kadriu holds a PhD degree in Computer Sciences from Ss. Cyril and Methodius University in Skopje from 2008, with a focus on natural language processing and information retrieval. She is an associate professor at the Faculty of Contemporary Sciences and Technologies at SEE University in Macedonia. She has also background in the internet of things, artificial intelligence, machine learning, programming paradigms, software engineering and e-learning. Also, she is mentoring several master thesis that involves web information retrieval and e-learning. She is author of more than 30 research papers. The author can be contacted at **a.kadriu@seeu.edu.mk.**