Exploring the Learning Profile of Information System Workers to Provide Effective Professional Development

Kordaki Maria[1], Thanasis Daradoumis[1,2], and Fragidakis Dimitrios[1]

[1] Department of Cultural Technology and Communication, University of the Aegean
81100 Mytilene, Greece
[2] Department of Computer Science, Multimedia and Telecommunications,
Open University of Catalonia, Barcelona, Spain
{m.kordaki,daradoumis}@aegean.gr, D.Fragidakis@nsk.gr

Abstract. This paper presents a research work that explores a variety of issues which, on the one hand, are related to the way the employees of a computerized workplace behave, work and learn and, on the other hand, try to identify the employees' knowledge, competencies, preferences, interests, deficiencies in knowledge, skills and abilities, training needs as well as socialization and health aspects. All these concerns lead to the construction of a rich learning profile of Information System employees which is a key issue for determining an adequate and timely training for the different types of employees and their needs. The methodology followed integrates a variety of profile assessment techniques, such as observation, questionnaires, interviews, focus groups, and documentation. This paper focuses more on the questionnaire technique where the main employee profile indicators are determined, analyzed and basic conclusions are drawn.

Keywords: learning profile, work-integrated learning, assessment techniques.

1 Introduction

This research aims at building a robust learning profile of employees who work with an Information System (IS) in a public organization. This learning profile will constitute then the base for developing a methodology and model that will allow the implementation of an adaptive and intuitive learning system which will be based on collaborative learning strategies and which will be used to provide training to the IS learners-employees, addressing both their particular goals, needs, preferences and interests and the increasing demands of the organization itself.

Literature research [1,2,3] shows that the development of a flexible and complete user learning profile is necessary so that to be able to provide him/her effective personalized training, monitoring, scaffolding and evaluation. Learners may also learn better and more effectively through an exploratory learning methodology and through collaboration in small groups, exchanging their personal experiences, helping each other, and learning/obtaining new knowledge together through experimentation, exploration, discovery, problem solving and critical thinking.

M.D. Lytras et al. (Eds.): WSKS 2011, CCIS 278, pp. 338–343, 2012.

As such, we initially need to extract knowledge about seven main indicators that concern the learner-employee profile. First, the learner-employee learning style; second, the aspects of the Information System (IS) that he/she would prefer to experience and learn about; third, aspects that include the workers' technical knowledge about the IS; fourth, the IS functionalities that the worker is using or would like to use; fifth, the workers' social past and current habits and how these habits have been changed due to the evolution of the IS in their work place; sixth, health issues associated with the use of the IS; and finally, information about the tasks that IS workers carry out in their work place. The first two indicators have been extensively explored and analyzed in the work of [4]. This paper focuses on the analysis of the last five indicators. The ultimate aim of the current study is to explore and build a solid and complete workers' learning profile in an IS-based working environment and then use it to provide them a better professional development, thus aiming at developing a live and more effective learning organization.

To explore and build the worker learning profile, we conducted a survey which took place in the central department of the Legal Council of the Hellenic State (hereafter, LCHS). Employees belong to several departmental sections and are all users of the IS. To identify the afore-mentioned aspects of the employees' learning profile regarding IS issues, we designed seven specific questionnaires, both with open and closed-type questions, the later following a five-point Likert scale. All questionnaires were given to the employees and those that were answered back were then evaluated and commented subsequently. The following sections describe the methodology (Section 2) and results obtained (Section 3). These results constitute the input data to build a complete learner profile module, which forms an important component of our adaptive, collaborative learning/training model. The final Section outlines the work done and makes reference to on-going and future work.

2 Research Objectives and Methodology

The research objectives that are set by this work coincide with the five specific analysis indicators and are explored and evaluated taking into consideration qualitative and quantitative characteristics. They are the following:

R1 Determine the user knowledge and skills with regard to the IS she/he is using.

R2 Identify specific functionalities/applications that a user would prefer the IS to have as well as the user behavior as regards e-environments and e-services.

R3 Find out the user socialization habits and how these have been evolved through his/her familiarization and use of the IS.

R4 Determine the main healthy issues that concern the user who works in a computerized environment.

R5 Identify and analyze the main tasks that an IS user is carrying out in his/her workplace.

3 Presentation-Annotation of the Aggregate Results of the Survey

In each questionnaire we have followed a five-point Likert scale. The five specific indicators regarding the users' profile are represented by the letters A to E. An indicator may be sub-divided into more specific variables or sub-factors (such as A1 and A2). Each indicator is measured by specific criteria/questions A.1.1., B.1.1.,…,E.1.1., where the first letter is the indicator, the first number is a sub-factor and the second number is a question associated with this subfactor.

3.1 Indicator A: The Workers' Knowledge and Technical Skills about the IS

This indicator is divided into two sub-factors (A1 and A2) which examine two important aspects of the IS workers: their basic background knowledge and skills about computers, as well as their knowledge and skills about some specific issues of an IS. These aspects are useful to identify for each individual user his/her area of interest which is more familiar with or not.

A1: User's Basic Background Knowledge about Computers: Interpreting the results which were obtained for the sub-factor A1 (8 questions were defined for this sub-factor) we came up to the following conclusions: The users of the IS know how to use the following applications quite well: (a) Microsoft office, (85%) (b) Workflow Management Systems (WMS), (74%),(c) E-mail Systems, (68%), (d) Real Time Web Meetings (Skype & Windows Messanger), (50%), (e) Social Networks (Facebook), (50%). They are not familiar (under 30%) with aspects like: DBase Management Systems, (b) Creation of web pages, and (c) Using Blogs. Here, it is significant to note that most users (75%) had enough previous experience in GUI environments and Web applications, but 80% of them had not any experience in WMS.

A2: User's Knowledge about Some Specific Issues of the IS: In this sub-factor, we examine whether the user knows about some specific issues that concern an IS, such as the development phases of an IS, its specification, the user ability about the languages and the Data Bases which are used, their capability to encounter errors, the use of manuals and help Desk. It is important to note that the most of the participants (more than 74%) answered 'NO' to the questions A2.1 – A2.11 that means that they have not any knowledge about these issues. It is also important to note that the rest of the users (26%) have more experience in these issues, but analyzing their answers to the open questions that accompanied each of the 14 initial questions indicated that they also need to learn more about aspects such as antivirus, Java, Oracle, and how to correct system errors. It is also detected that most of them (80%) expressed that they have not been involved or they did not know the development phases of an IS.

3.2 Indicator B: The IS Functionalities That Workers Are Using or Would Like to Use

This indicator examines two important aspects (sub-factors) that an IS worker prefers the IS to provide: the first one concerns the technical environment of the IS where the worker is carrying out his/her tasks, whereby the second one explores the networking

environment of the IS, in particular those internet applications that facilitate the connection between employees, their training needs as well as the interconnection between branch offices.

B1: The Technical Environment of the IS Where the Employee Is Working: This sub-factor examines the functionalities of the IS and the user needs in accordance to the requirements of the LCHS. The results of the questionnaire showed that the employees have strong enough preferences toward specific functionalities that the IS should provide, namely: (a) a functional, user-friendly GUI, (95%), (b) a multiuser-multitasking environment, (90%), (c) a video file as guidance to understand the environment, (79%), (d) a voice file as guidance to understand the environment, (77%) and (e) a presentation with pictures to understand the environment, (63%).

As a result, the IS should have functionalities that provide information, assistance and services to the users of the system.

B2: The Networking Environment of the IS: This sub-factor shows interesting results. In particular, as it is shown from the participants answers, not all users have e-mail facilities (B.2.1) and not all users have access via Mini-Syzefxis network (B.2.7). The answers to the rest questions show that users do not have any access to facilities, such as: (a) Synchronous Learning Environment, (B.2.2), (b) Asynchronous Learning Environment, (B.2.3), (c) Web-conference, (B.2.4), (d) Application Sharing System, (B.2.5), and (e) Collaborative Learning System, (B.2.6). According the above, we detect that these users like GUI applications, as well as video, voice or presentation files in a multiuser-multitasking environment. However, despite the fact that, they do not have any access at all the aforementioned services, their answers indicated that they are willing to have all the above possibilities so that they be able to connect with other employees and collaborate with them.

3.3 Indicator C: The Workers' Social Past and Current Habits and How These Habits Have Been Changed due to the Evolution of the IS in Their Work Place

This indicator examines the workers' socialization habits, and how they have been changed due to the evolution of the specific IS in their work place. Thus, it is divided into two categories (C1 and C2). The results obtained according to the questionnaire (using the values “Agree” & “Strongly Agree”) are as follows:

C1: Past Habits of the IS Users of the LCHS
C1.1: I used to be informed through the mass media (84%)
C1.2: I used to communicate by post and telegraph (26%)
C1.3: I used to be informed about my personal interests from the mass media (58%)
C1.4: I used to express my thoughts and concerns by phone63%
C1.5: I used to perform my financial transactions through the relevant organizations (74%)

C2: Present Habits of the IS Users of the LCHS
C.2.1: I read news from the Internet (news, technology development, etc.) (79%)
C.2.2: I use e-mail services (58%)
C.2.3: I buy consumer goods from the internet (11%)

C.2.4: I find information about my personal interests by using the Internet (63%)
C.2.5: I search information for consumer products via Internet (68%)
C.2.6: I express my thoughts and concerns in blogs, forums, etc. (11%)
C.2.7: I pay my financial transactions (banking, etc.) via Internet (16%)
C.2.8: I keep up with technological developments through appropriate sites (32%)

Based on the above, we can say, that the current e-socialization of the users is high enough. We can also see the evolution of their habits by comparing the above results.

3.4 Indicator D: Health Issues Associated with the Use of the IS

This indicator examines how Healthy the Work Environment (HWE) is, how the users' health is being affected by their working environment. The analysis of the data shows the percentages of the negative answers that concern the following aspects:

D1.1: How does the IS affect the health of the user (68%)
D1.2: What is the impact that the IS has on your health (63%)
D1.3: I am informed by my work about the notion of HWE (100%)
D1.4: I am informed about the necessary exercises to do to avoid "RSI" (89%)
D1.5: I am informed about the specific exercises that are necessary to do for the spinal column (89%)
D1.6: I recycle the printed paper that I do not need (58%)

Based on the above, it should be suggested to the LCHS to inform their users about HWE issues, so that they feel more confident and productive in their environment.

3.5 Indicator E: Main Tasks that IS Workers Carry out in Their Work Place

This indicator examines the main tasks that the IS workers of LCHS have to carry out in a daily basis. We have identified 8 main tasks and we asked how often the users execute these tasks, using a 4 Likert scale. Then we associated a number of close-type questions with each task, using a 5 Likert scale, in order to extract more specific information regarding each task. Below, we present the results obtained for each task and their associated questions; here the codes in parentheses represent the tasks and their associated questions, whereas the percentages concern the positive answers.

1. I carry out data entry and data processing (E.A: 95%): (a) The data entry requires many clicks (E.A1: 89%), (b) The data process is functional, effective and reliable (E.A2: 90%), (c) The access in the system is fast (E.A3: 94%), (d) There are unnecessary clicks at the registration process (E.A4: 73%), and (e) The system's response is immediate (E.A5: 94%)
2. I use the capabilities of IS to search for folders / documents files (E.B: 100%): (a) These capabilities cover completely the needs of my office (E.B1: 84%), (b) The data results in forms/reports are presented structured and clearly (E.B2: 90%).
3. I use office applications (E.C: 90%): (a) The computing resources of my PC (CPU) are sufficient for the applications of my office (E.C1: 79%), and (b) There is a direct or indirect notice in case of system failure (E.C2: 68%).

4. I use the IS WEB application (Document Management System) in LCHS (E.D: 58%): (a) There are procedures which control the functioning of the infrastructure and services offered by the IS (E.D1: 63%).
5. I exchange messages between users (E.E: 21%): (a) The exchange of e-mails helps the resolution of problems in my office (E.E1: 53%), and (b) The process of a case becomes easier through exchanging e-mails (E.E2: 68%).
6. I send electronic requests (Tickets) to the IS administrator (E.ST: 10%): (a) I use the phone to report a system error in my office (E.ST1: 79%), (b) I send e-mails (Tickets) to Administrators in order to declare a system fault (E.ST2: 16%).
7. I use the Calendar for due tasks – Reminders (E.Z: 10%): (a) I use the electronic way of the IS to keep future reminders or due tasks. (E.Z1: 10%), and (b) I use the traditional way (handwritten) to keep future reminders or due tasks (E.Z2: 68%).
8. I use other applications/services offered by the IS of LCHS (E.H: 10%).

Based on the above, we can say that, in general, the users carry out their tasks with the IS smoothly.

4 Summary and Future Work

In this paper we presented a methodology that analyses a variety of issues that concern the Information System (IS) workers' learning profile. The analysis of these issues shows interesting results and draws important conclusions that can be used to determine the behavior, performance and training needs of IS workers. The ultimate aim of this work is to build a complete analysis plan for determining the learning profile of IS workers. This in turn will be used to identify who needs training as well as to determine employees' readiness for training. It is very important for any organization to focus equal attention on the strengths and weaknesses of its workers' performances, give employees positive reinforcement when they perform well, make its employees aware that their work performance is being monitored continuously, increase management's support, involvement and resource allocation; all in all, take care that employees can receive adequate and timely help and training.

References

1. Dolog, P., Schäfer, M.: A Framework for Browsing, Manipulating and Maintaining Interoperable Learner Profiles. In: Ardissono, L., Brna, P., Mitrović, A. (eds.) UM 2005. LNCS (LNAI), vol. 3538, pp. 397–401. Springer, Heidelberg (2005)
2. Eraut, M., Hirsh, W.: The Significance of Workplace Learning for Individuals, Groups and Organisations. SKOPE, Oxford & Cardiff Universities (2007)
3. Ley, T., Ulbrich, A., Scheir, P., Lindstaedt, S.N., Kump, B., Albert, D.: Modelling Competencies for supporting Work-integrated Learning in Knowledge Work. Journal of Knowledge Management 12(6), 31–47 (2008)
4. Kordaki, M., Daradoumis, T., Fragidakis, D., Grigoriadou, M.: Collaborative and Adaptive Design Pattern for the 'Students Team Achievement Divisions' Method: An initial implementation within Information Technology Work Place. In: Intelligent Adaptation and Personalization Techniques in Computer-Supported Collaborative Learning. Series "Studies in Computational Intelligence", Springer, Heidelberg (to appear)