USER INTERFACE AGILE DEVELOPMENT AND EVALUATION OF THE IKNOW STUDENT SERVICES SYSTEM

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ABSTRACT

This paper describes the agile user interface design and development of the iKnow student services system. The evaluation of the system was thoroughly performed by using a detailed questionnaire given to multiple users. The results of the evaluation are presented.

I. INTRODUCTION

Electronic student services systems are complex information systems. They encompass multitude of functionalities provided to numerous users with different access privileges. Also, the users have different levels of familiarity to the system and the underlying processes. The user interface and its performance is essential for the system's adoption as much as the systems reliability and scope of functionalities.[5],[6] Agile development of a user interface is necessary because of multiple reasons.

- because of changing requirements [4]
- because of user satisfaction
    - constructive remarks by experienced users
    - habits gained by using legacy applications
    - trial period experiences
    - upgrade of technologies during development

II. USER REQUIREMENTS

Users demanded several features important for them:

- grouping of functionalities on fewer forms
    - easy access
    - decreased need for navigation (Fig.1))
- Screen size and resolution (conflicting) [2], [3]
- Impossible to make an error [1]
- Automation of processes
- Simplicity

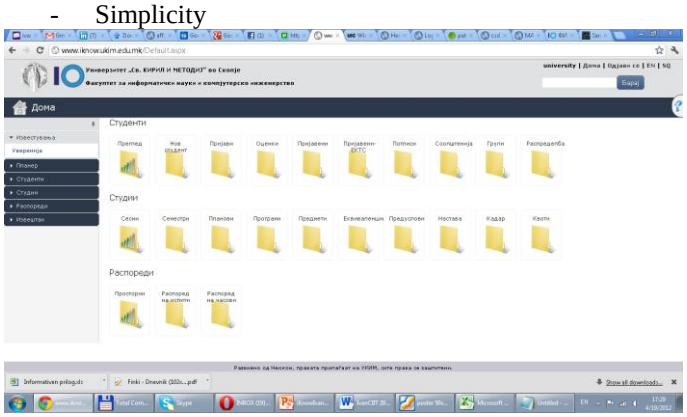

Figure 1: Homepage – navigation through standard top and side menus or folder like structure in the middle of the screen

Users tend to avoid leaving the current page that they are working on, due to time-consuming navigation. Therefore the forms were heavily enriched with popups that could present additional information or provide means for inserting/updating data [7]. Standard web page popups were avoided as deprecated, and instead, hidden forms existing on the same web page were used (Fig. 3). Although effective in terms of work efficiency and user satisfaction, such forms tend to exponentially grow in complexity and size. The side-effects of such policies are complex forms prone to higher number of errors and extreme difficulty to test and validate. Server side preparation of such forms presents a serious load on both the application and database server. Additionally, the size of the content itself is a burden to the internet link generating significant traffic. Since the demands are conflicting, a balance had to be reached for effective, but still lightweight forms that could be easily navigable. The advantages of AJAX and caching were heavily used to achieve the desired goals. Fig. 2 shows a form in which students choose the courses they will enrol during the semester. Multiple calculations are performed in real time concerning the allowed courses that the student should take, the courses the student must repeat, the ECTS credit limitations in the semester, the financial implications of the selections, etc.

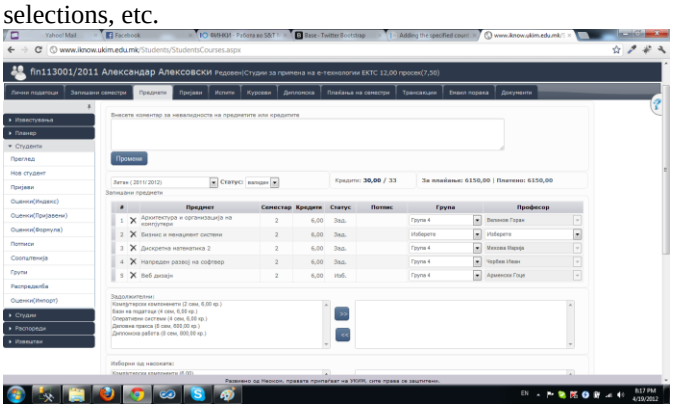

Figure 2: Courses selection per semester, a backend complex form rendered easy to use

The screen size of the monitors used by the employees in the student services department varied starting from 15" up to 22". Therefore an adaptive interface had to be developed that is capable of using the benefits of large screens and resolutions, in the same time avoiding rendering small monitors useless. The content had to be visible and the interface usable in all screen sizes. Additionally, management used pads mainly for reporting, adding another layer of

complexity, making the interface workable on touch screens and appropriate screen resolutions.

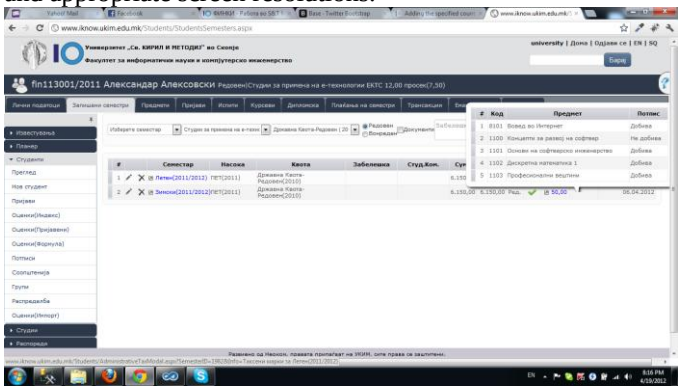

Figure 3: Overview of student semesters, expandable as needed with modal popups with additional data for SMS payments, courses enrolled in the semester, etc..

Although training is always thorough and unavoidable when deploying a complex information system such as this one, users tend to learn the system by "trial and error" and intuition. The user interface had to provide clear and short labels and messages, avoid easy deletion, and lead the user through the business processes modelled. Simplicity is a key issue (Fig. 4).

Figure 4: Modal popup for SMS payment automation

Efficient use of the workforce in the student services department is only possible if the processes are as automated as possible (Fig. 5).

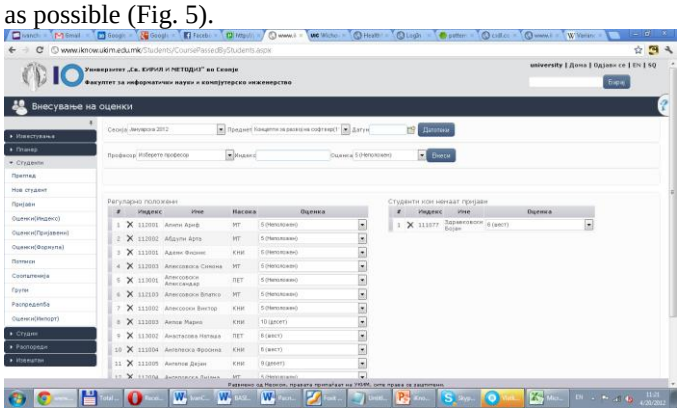

Figure 5: Bulk importing and fast input of grades for exams passed.

III. QUESTIONNAIRE

The questionnaire consisted of 33 questions. Each question was answered by the users with a grade of 1-5. The user could answer with a 0 if he/she had no opinion on the matter.
The questions were as follows:

Accessibility
1. How do you judge the information about the launch and the training you received?
2. How do you access the process of registration?
3. Does your browser display all information correctly?
4. Is site load time appropriate to content and response?

Layout
5. Text-to-background contrast
6. Is the font size and style easy to read?
7. Does the site have a consistent look and feel?
8. If you have a disability regarding your eyesight: Is the content readable?
9. Is the label location and format consistent?

Navigation
10. Are the major parts/menus of the site directly accessible from the main page
11. Are the navigation labels clear and descriptive?
12. Is the workflow navigation consistent and easy to identify?
13. Is the respective location within the process (site) transparent?
14. Is the site search easy to access?
15. Is the exit point clear on each page?
16. Does it require minimal steps in sequential menu selection

Exception and status handling
17. Are the messages regarding status clear and descriptive?
18. Are the messages regarding exceptions/errors clear and descriptive?
19. Position of messages on screen is good

User guidelines and online help
20. Is the site designed to require minimal help and instructions?
21. Is the help and instruction information easily accessible?
22. Is there an easy channel available to communicate with an administrator?

Learning
23. Easy to learn to operate the system
24. Easy to explore new features by trial and error
25. Easy to remember names and use of commands

Quality and structure of information
Content and Efficiency (refers to all information i.e. field explanations, order of fields)
26. Is the content understandable?
27. Is the content well-structured and correlates to your requirements?

28. How do you evaluate the support of the system?
29. Do you observe an increase in efficiency?
30. Does the system provide a sufficient number and quality of reports?
31. It is easy to use.
32. What is your overall evaluation of the system?
33. Do you have any further comments?

IV. Evaluation results

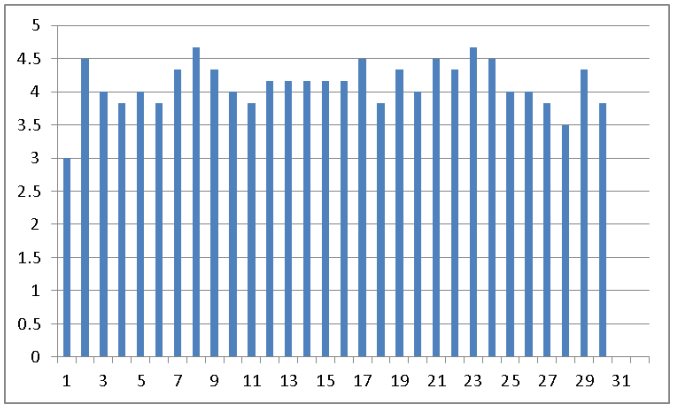

Figure 6: Average grades given by the users in the questionnaire.

Fig. 6 presents the average grade awarded to each question by the users, while Fig. 7 presents the variance of the average grades.

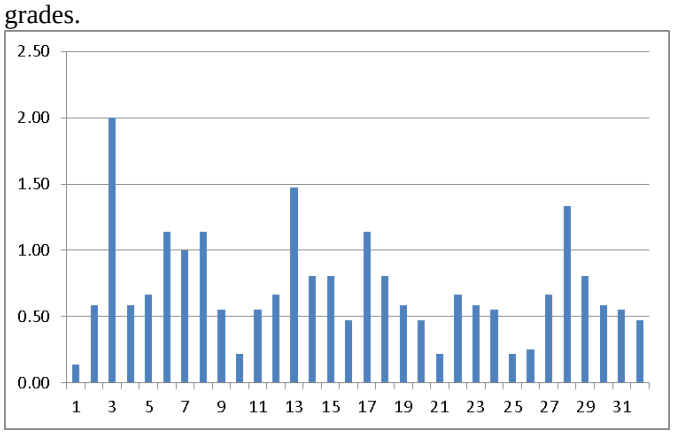

Figure 7: Variance of average grades given by the users in the questionnaire.

The user satisfaction is evidently high, due to their participation in the user interface fine tuning and the efficient interface that resulted.

V. Conclusion

Making a complex student e-services information system is a challenge by itself. Making its user interface simple to use and learn, as well as efficient, adds another equally important layer of difficulty. In this particular project, due to the careful approach, detailed and flexible initial projects specification and adequate agile development, the conflicting business and user demands were achieved in great part. There is always room for corrections and upgrades and it is excpected that they will be carefully implemented. This is especially true in systems like this were requirements constantly change.

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USING FACEBOOK FOR QUALITY CONTROL OF IKNOW SYSTEM

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ABSTRACT

The general objective of this paper is explore the possibilities to perform quality control of the iKnow system using social networks like Facebook and how to improve student's processes with their own help. In this paper we describe the methods we are planning to use and also the starting results from the already settled platform.

I. INTRODUCTION

Social networks became one of the most pervasive trends today. They are part of our everyday life. We use them for a lot of reasons: friends, family, colleagues, events information… But we also use them when we seek answers for various problems. This is the idea behind this paper: how to use social networks to improve and assure quality of software – the iKnow university system.

The iKnow project aims to modernize the capacity, management and governance of higher education institutions. This project sets the student to be the center of the education system and its goal is to develop design for new eStudent system - University management and services for students.

Specific objectives of the iKnow system are to develop design and enable conditions for realization of eStudent Information System for

- enrolment process,
- identity management, with authorisation and access control,
- management of university services and resources usage (accounting),
- administration of europassCV, ECTS, diploma supplement and other certification issuing
- administration of student activities,
- administration of registration and schedules of classes and assignments,
- administration of academic results, including course, exam and study results.

In the following sections we will describe he influence that social networks and media have, how the students use them and how to ensure quality control. We will also give overview of our usage of Facebook as a quality control tool for the iKnow system and the starting results we obtained.

II. SOCIAL NETWORKS IMPACT

Social networks are increasing their power of impact and play important role in a lot of social and political spheres [1].

Social network sites are defined "*as web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site.*" [2].

Social networks have impact on knowledge management: they can help locate expertise, seed new communities of practice, and develop cross functional knowledge-sharing. [3]. Also they have impact in information processing and organizational learning literatures [4]. Social networks enable social support, collaborative information sharing, content creation, and knowledge aggregation [5]. They are widely used by the students [6] and what is more interesting fact - social networks users mostly are good students [7].

A. The Facebook phenomenon

Facebook is one of the biggest with 835,525,280 users in March 2012 [8]. It is one of the global social communities with the highest growth rate in the recent years. Facebook was launched in February 2004 and the number of user started to increase actively in 2008. It has higher connectivity and it takes the second place in Alexa traffic rank [9]. Facebook enables internal communities to connect with external network communities and to achieve the purpose of integrating the community network society [11].

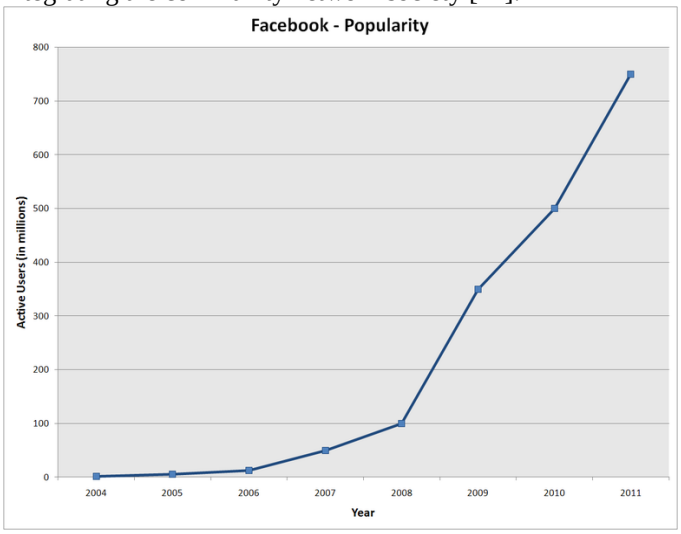

Figure 1: The growth of Facebook popularity [10]

It has been show that Facebook can be used as a learning tool; it has simple, convenient, easy, and user friendly environment for academic discussions [12]. Students are comfortable in this environment and different Facebook features like Facebook Groups or Chat that could be useful in courses [13].

III. SOFTWARE QUALITY CONTROL

"*Software Quality Assurance rocesses provide assurance that the software products and processes in the project life*

cycle conform to their specified requirements by planning, enacting, and performing a set of activities to provide adequate confidence that quality is being built into the software." [15]. One of the key features for developing high-quality software is measuring quality and this activity is continuing work in software development life-cycle. [16]

Three distinct components of quality can be identified [17]:

- an objectively assessable component,
- a subjectively assessable component
- and a non-assessable component.

IV. iKnow Quality Control Roadmap

Quality assurance is very important part of developing the iKnow system. In oreder to meet the prerequisites a quality control plan is created and it consists of three deliveries, corresponding to the components of quality.

The first milestone is development of quality plan with methodology and identification of key performance indicators. This methodology defines how the achievement and project deliveries are measured in an objective, quantifiable and qualitative way. It also defines how timings about reaching deadlines can be interpreted. The main goal is to define adjustment mechanisms, if obstacles occur and provoke delays, or if achieved quality differs from expectations.

The first delivery concerns monitoring of activities by a number of progress indicators: quality of deliveries, quality of dissemination and sustainability strategies and action plans, evaluation of feedback.

The second delivery is about internal evaluation of packages. Five stakeholder levels realize internal review: administration, professors, university management, Ministry of education, and students. This will ensure high quality of the realized system.

The last delivery concerns external quality audit, including referee reports surveys with user satisfaction and feedback analysis. Besides external evaluators we plan to realize surveys addressing student focus groups by sophisticated innovative approach – social media and other knowledge management techniques that include investigation of public opinion and opinion of government representatives.

V. Usage of Facebook for iKnow Quality Control

One of the reasons we choose Facebook out of the social networks spectrum for our purpose is the fact that Facebook is widely used in Europe, and especially in Macedonia. According to Internet World Stats [18] on Dec 31/11 Macedonia had 879,540 Facebook users, but Macedonia have population of 2,077,328, which means that 42.3% of the population of Macedonia is using Facebook. That gives us the assumption that most of the students (that will use the iKnow system) at our University already have Facebook accounts.

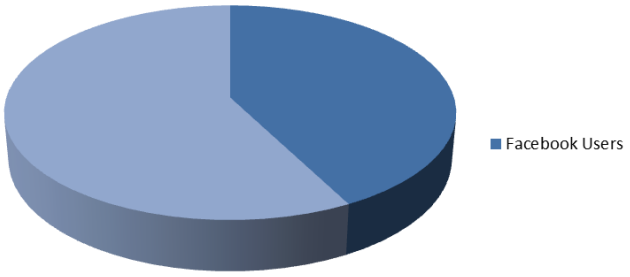

Figure 2: Facebook usage in Macedonia

Other reasons why we chose Facebook for this activity are following:

- Natural environment to post feedbacks – Facebook already represents an appropriate environment to share opinion and post feedback on some activity
- Students spend a lot of time on FB – judging on the numerous times we have seen our students to use Facebook in the faculty labs, groups that students have and exchange information we can conclude that most of the students are using their accounts on everyday basis
- Previous experience (ours & student's) – during the beginning phases and implementation of this project at the Faculty of Computer Science and Engineering Facebook have been used for Q&A and as an opinion gathering tools. The results of this usage are show effective and resulting.
- Statistics – Facebook offers statistics reports [19] about page views, posts and post's influence, user's gender and age statistics etc…

The first step of the process was to create a page on Facebook for the iKnow system. After that we published an announcement about the page on three 1st year courses at the Faculty of Computer Science and Engineering and we watched for the results:

- 5 minutes later - 5 users joined the page
- 10 minutes later - 10 users joined the page
- 24 hours later – 55 users joined the page

A week later we exported the statistics of the page. Figure 3, 4, 5 and 6 show the statistics about the first week. Figure 3 shows the statistics about the number of people sharing stories about the page. Figure 4 shows the statistics about the number of people who have seen any content associated with our page. Figure 5 shows the statistics about the number of people who saw the page or one of its posts. Figure 6 shows the statistics about the number of impressions seen of any content associated with the page.

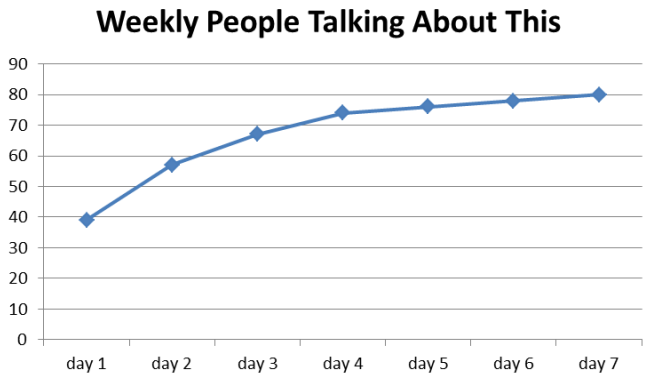

Figure 3: Weekly - The number of people sharing stories about the page

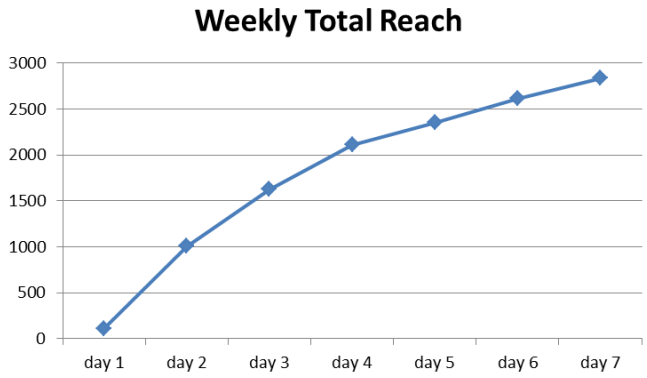

Figure 4: Weekly - The number of people who have seen any content associated with the page

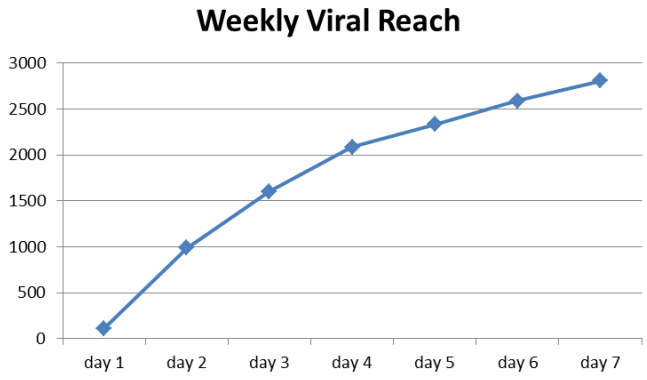

Figure 5: Weekly - The number of people who saw the page or one of its posts

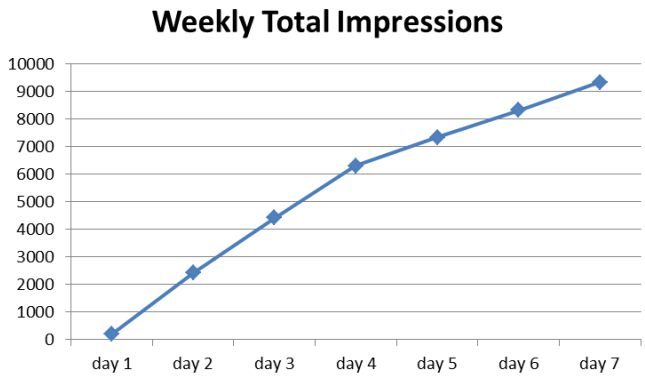

Figure 6: Weekly - The number of impressions seen of any content associated with the page

The idea is to use this page for several purposes:

- Inform students about any changes
- Answer student questions
- Receive feedback on old and new functionalities
- Inform students about upcoming events

VI. Conclusion

Our experience and previous surveys have shown that Facebook is widely used by the students and it is starting to become a natural environment for seeking opinion and feedback, which can be used for software quality control.

The statistics from the first week of the Facebook page showed high activity by the students, which encourage us to believe that they will be willing to actively participate and communicate. In that way the final deliverable of the quality control plan will be finish.

VII. Future work

Till now the iKnow project was in the beginning phase and it was used only be few faculties. Starting the next semester the system will be used by all of the faculties of the St. Cyril and Methodious University. We anticipate considerable increase of activity on the Facebook page and finishing the finale quality control deliverable.

We are also considering usage of data mining techniques for text processing of the posts and extract knowledge about the students experience with the system and most comment features.

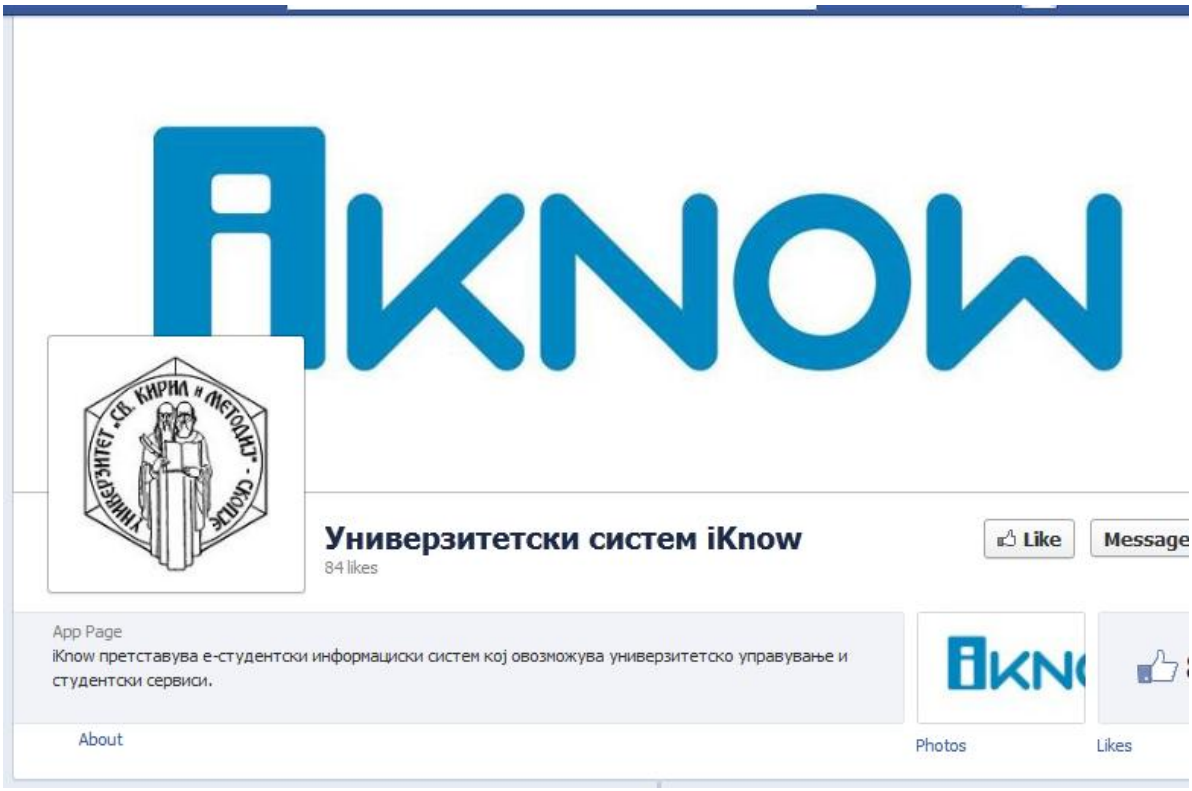

Figure 7: iKnow Facebook page

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