M-Tourism Education for Future Quality Management

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Abstract: Tourism is the main income source of revenue in GDP in many countries. For 2012 the relative contribution of tourism in GDP in Croatia was 11.9%, in Greece, 6.5% and in Romania was 1.5%. The tourism industry is characterized by high level technology, qualifications of staff and quality management. Increasing the quality and productivity in the industry is achieved through education and certification of workforce. Nowadays due to advanced technologies and permanent lack of time the education is done more and more through mobile device. The characteristics of the processes of education using computer applications based on mobile technologies and security requirements for M-Learning systems are presented. It constructed a metric to determine the behavior of information applications in tourism education.

Keywords: Tourism, Mobile Learning, Quality Management, Security

1. Education and E-Learning in Tourism Industry

Tourism is represented by activities performed for recreation, for resting or for leisure time. In some countries such as Croatia, Greece, Egypt or Thailand tourism is very important because of the income and the contribution to GDP. According to The Authority on World Travel & Tourism (2013) contributions in the GDP for the year 2012 were substantial. The top ten countries in the hierarchy after the absolute value of direct contribution to GDP are shown in Table 1.

Table 1. Absolute and relative direct contribution of tourism to GDP

Index	Country	Absolute contribution ($ billions)	Relative contribution (%)
1	United States	438.5	2.8
2	China	215.4	2.6
3	Japan	127.6	2.1
4	France	99.7	3.8
5	Italy	81.9	4.1
6	Brazil	76.9	3.4
7	Spain	73.3	5.4
8	Mexico	68.3	5.8
9	United Kingdom	58.4	3.1
10	Germany	55.4	1.8
65	Romania	2.6	1.5

In Romania in 2011 contribution to GDP was $ 2.5 billion. Thus increasing from 2011 to 2012 was $ 1 billion, which represents an increase of 4% in 2012 compared to 2011.
This increase shows that Romania is a country that is present growth of the tourism industry. Growth which must be ensured by quality tourism and management features so that all activities to be monitored and controlled.
In addition to direct income and indirect tourism contribute to GDP through tourism related service industries. Industry services include transport and accommodation services.
Control the quality of tourism growth is ensured by measures taken on the:

- seasonality and repeatability in terms of periods in which people undertake recreational and leisure activities;
- processes and activities to attract tourists to the area representative for the local or regional tourism;
- service packages offered to tourists through loyalty, promotional packages with optional services included in the base price;
- workforce in the tourism services, tourism employed persons must prove an adequate training in working environment, offering tourists with high quality services according to their expectations.

Quality of tourism services according to Butnaru et al (2012), Aldebert et al (2011) is influenced most by staff performance especially in large units. Package, food, accommodation, entertainment, maintenance or other activities can be found in several travel agencies grid, instead of staff performance cannot be offered identical in several locations. Such certification is required and training staff continue to work undertaken in the field of tourism. Thus, a restaurant staff should be trained to daily settlement table linens, in a hotel with settlement linen, towels and soap in bathroom.

Staff employed in tourism does not have very much free time, more than it has so little free time periods between different activities, such training makes for short periods of time and in different locations. For such training most suitable training through mobile devices that are present regardless of location and time. Mobile technology increasingly penetrates the tourism industry according to Ivan (2009).

Education involves reading courses on the mobile device, viewing videos with demonstrations of place cutlery, linen and towels.

Fee paying courses is via the mobile operator, the amount being paid to pay your bill and the operator transferring the money to educate suppliers' service.

Testing is also done through mobile devices for obtaining certification following the user to move during the season in an examination center where the final exam, after which you get diploma.

2. Features of M-Education Processes

Lee and Salman (2012) define M-Education term as Science in Hand and requires the use of mobile devices to obtain information, for reading courses or to train any person.

M-education processes has the following features:

- diversity of users on the set of people who use mobile devices;
- distinct but homogeneous categories of users such as teachers, students, administrators, developers tutorials and learning materials for the platform, these groups form and applications of M-Learning modules, each category of users with a specific module within the application;
- accessing application is made anywhere regardless of space, it can be accessed from the car, in public transport, in the park, at work or elsewhere;
- short interaction time due to accessing the application in various places and unavailable to users for a very long time;
- small size of the screen that displays information, mobile devices are characterized by small size such information must be tailored to the small size of the screen;
- amount of information transmitted via the Internet to be reduced because of high costs imposed by mobile phone operators for data;
- the presentation of information should be done through images and sounds because a very large text is hard to follow on a small screen such as mobile devices;
- terms using a common vocabulary known to all users, we recommend the use of terms and symbols known users in other similar applications, so existing applications to be analyzed and built a vocabulary of terms for the new application;
- prioritization of frequently used items and placing them so that they are easily accessible through the surgery to speed up user interaction, thus it creates a profile of the user and quickly provided the necessary information to the image;
- constructing a map of the application for the user to know in what way the application quickly find the desired information;
- security of confidential information stored about users logged into the application, for registration information users provide is kept confidential and secure;
- friendly interface and applications are oriented citizen, writing text should be as short as any writing application user must come up with suggestions for auto complete of the user to select the desired option;
- innovation of applications close on the larger user and perform certain services or calculations very quickly and on the spot, the user is not forced to wait for them very much, also allowed users to upload material into the application and bring their own contribution to detached and platform development experience gained through working in the field; cater loaded by users are validated by administrators will then be available to other users using the platform for training;
- automatic testing and complex test results so users will be provided immediately after the test, the user is not forced to wait for it, in this way ensuring staff training application, its testing and certification exams after data;

- independence from the administrators and application developers, application must be functional regardless of time or the availability of certain persons;

These particularities are met for all applications in the M-Learning Environment. These features determine the characteristics of mobile applications based on their educational system and determine the quality of mobile applications.

3. Security Requirements in M-Education

Due to the nonhomogeneity of the target group requires that m-education applications meet certain safety requirements and all mobile applications according to Ivan (2013):

- authenticate each user and depending on the type of module is oriented properly, so teachers are oriented module for teachers, students and administrators the module for students by the administration of the platform;
- ensure consistency and accuracy of data input validation through time entry, validation must be complex for the data to be adequately controlled and rigorously;
- user permission to access a single module, so if a student does not have access courses access to tests or exam during the exam and if you cannot access courses, for this user is redirected to a module created for this, Figure 1; thus the user unable to access another module, it will be automatically directed to the module already accessed;

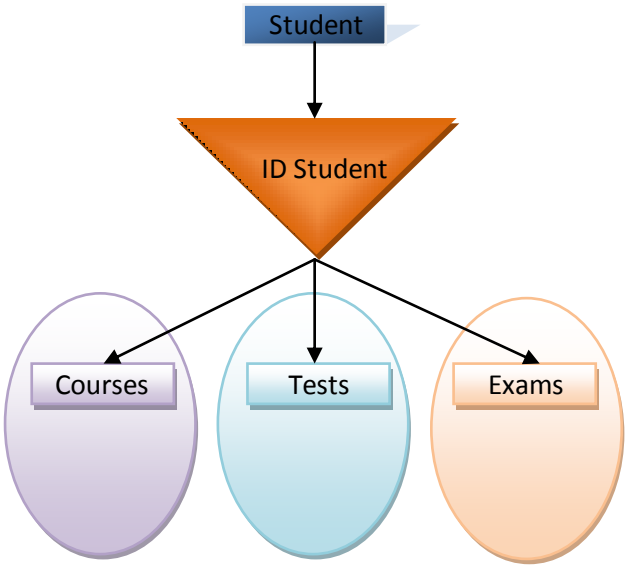

Figure 1. Controlled access to the modules

- existing data control platform in order to preserve the integrity of information provided by the platform, because the platform presents a high dynamism and users can upload new information in correlation with their experience, this information must be regularly checked and ensure the integrity of all information existing platform, this control is needed to increase the quality of information on the quality platform and mobile application automatically used for learning;
- logging all information access platform to be able to analyze who made some modifications, and if identification of problems will be checked logs of records backwards until the cause of the problem and identify the user responsible for the occurrence of the problem, so any change in the platform such information are saved:
  - user ID;
  - modified date;
  - mobile device type that was made change;
  - reason for change (improvement, contribution or other);
- encryption of personal information stored on the platform but the information stored by users and answers to tests or exams, because the application is mobile examination is held at the same time by all students, if a student exam earlier than other students the answers provided by it is encrypted so it cannot be accessed by

other students who have not yet sustained examination; Another way to avoid copying answers from other students by students who take the tests of time is like Fields of the examination to be changed from one student to another, such questions are difficult to create similar but different and each student is determined a grid of questions, which differ from one grid to another student;

Fulfilling these requirements lead to security compliance minim quality educational environment for mobile applications. To increase the quality of these applications is necessary to identify solutions to increase security of the educational mobile applications for tourism.

4. Solutions to Increase the Security in Informatics Tourism Applications

The continuous development of existing applications should be aimed at increasing its security. Such development is done by adding new modules in the application to meet the new security standards occurred since the last application development. Development does not delete the old existing modules in the application. Removing some modules in special security modules and thus lead to a decrease in lower quality security application developed according to Ivan et al. (2012), Pocatilu (2010).

Siveco Romania has implemented solutions for education dedicated to large audience. They have educational portals, virtual laboratories and academic platforms.

Authentication in the application is based on the username and password. To increase security keeps logging this model but is also developing an adjacent module takes into account the identification code of the mobile device that is logging. Such a user will only be allowed to log on his mobile phone. Avoid an examination in this way by other people in the name of students, Figure 2.

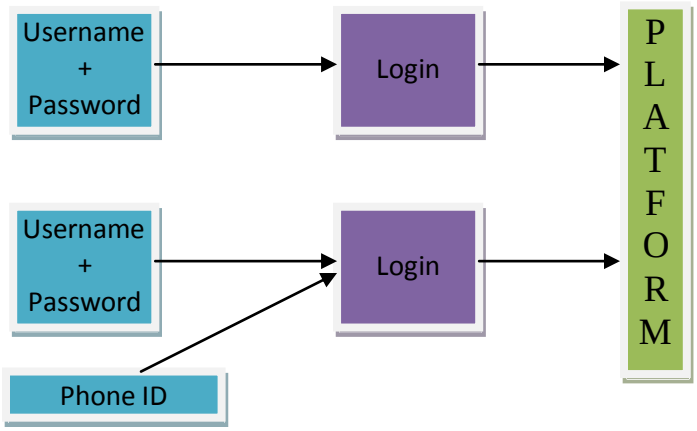

Figure 2. Increased security when logging into the application

The old model is still used in parallel but is also used in the new phone number is automatically checked by the application without the user having it provide. Access to the platform is achieved by means of two models of log.

For users increased security is achieved by implementing new input validation by them. Thus in addition to the existing checks are implemented some new more complex information to provide an adequate analysis of this information introduced and certification. It is also recommended to remove the text input by the user because writing text on a mobile device is very difficult. If in some application modules are text entry and they cannot be completely replaced with controls for selection by the user only to select the desired option is recommended developing suggestions for text input controls. This solution increases speed and increases interaction with mobile application and security because this will not enter the wrong words but words already in the platform default vocabulary.

Registered users on the platform after logging have access to courses, video tutorials, tests and exams. For unregistered users is allowed the access to simple classes, free tutorials and simple tests, Figure 3.

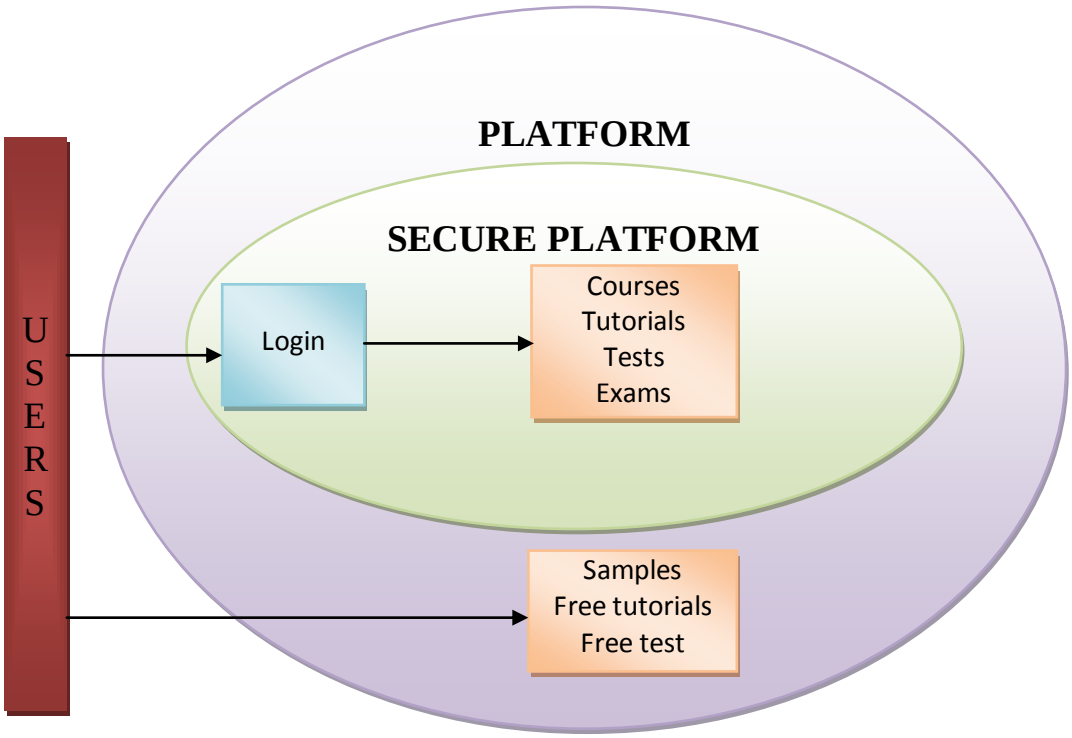

Figure 3. Access to resources available on the platform

Resources available for registered users are secured and encrypted. If unregistered users make request for these resources, they are redirected to the registration page. After registration and account validation newly created resource access is allowed because the moment users are part of the register on the platform.

5. Behavior Metric for M-EIA (M-Education Informatics Applications)

Metric behavior of computer applications in the M-Educational contains indicators for calculating the efficiency and quality of education in tourism platform.

The registration indicator on the platform of people who view the free tutorials, RI is calculated by the formula:

$$RI = \frac{NRPV}{NPV}$$

where:

NPV – number of people who have viewed free tutorials;
NRPV – number of registred people who have viewed free tutorials.

The indicator takes values in the interval [0;1]. IF RI=1 then free tutorials offered to unregistered users have a high quality and convincing all users have looked to make an account on platform. If RI=0 any user of who have viewed the free tutorials don't made an account on the platform, thus the quality of these materials is very low.

This indicator shows the quality of the materials offered for free to view users that are not logged in or registered on the platform. Their quality determines the users to make their account to access the rest of tutorials or exam and getting certification.

The second indicator is graduation indicator in relation to the total number of registered users on the platform, GI_{TU}, calculated by the formula:

$$GI_{TU} = \frac{NGP}{NRU}$$

where:

NGP – number of graduated people;
NRU – number of registered users on the platform.

The indicator takes values in the interval [0; 1] and determines the graduation rate in relation to the total number of students. Such efficiency and quality is pursued teaching materials provided through the platform and the ratio of these materials and data subjects for graduation or obtaining certification exams. For better accuracy and quality levels for materials provided on the platform graduated indicator relative to the number of users who have taking the final exam, GI_{FU}, calculated by the formula:

$$GI_{FU} = \frac{NGP}{NUF}$$

where:

NUF – number of users who have taking the final exam.

The indicator takes values in the interval [0; 1] and eliminates the difference created by the users who access the platform but not going to the final exam.
Because the instruction is only through mobile device can automatically take action on the time spent learning. This will determine if the time spent learning directly influence the mark in the final exam.
It is considered the set, S, of registered users:

$$S = \{S_1 \quad S_2 \quad ... \quad S_n\}$$

where:

n – number of registered users

For each user, S_i, determine the time spent on the platform, LT_{S_i} by the formula:

$$LT_{S_i} = \sum_{j=1}^{m_{S_i}} (LT_{S_i}^j end - LT_{S_i}^j start)$$

where:

m – number of accesses by the user S_i on the platform;

$LT_{S_i}^j start$ – start time for j access;

$LT_{S_i}^j end$ – end time for j access.

In this way we obtain the set LT, whose elements represent the time spent by each student on the platform:

$$LT = \{LT_{S_1} \quad LT_{S_2} \quad ... \quad LT_{S_{ns}}\}$$

From automated data collection we obtain the set D, the student notes:

$$D = \{D_{S_1} \quad D_{S_2} \quad ... \quad D_{S_n}\}$$

For the two sets is calculated minimum time spent by a user who has obtained certification, LT_{gr}, and the maximum time spent by a user who has not obtained certification, LT_{re}.

$$LT_{gr} = \min\left(LT_{S_i} \in LT \quad | \quad S_i \in S; \quad i = \overline{1:n}; \quad D_{S_i} \in D \quad D_{S_i} \geq 5\right)$$

$$LT_{re} = \max\left(LT_{S_i} \in LT \quad | \quad S_i \in S; \quad i = \overline{1:n}; \quad D_{S_i} \in D \quad D_{S_i} < 5\right)$$

Based on the calculated time to determine the influence of the learning to obtained result on final exam.

If $LT_{gr} < LT_{re}$ then the learning time spent on the platform have a substantially influence for the degree obtained on the final exam.

If $LT_{gr} > LT_{re}$, the degree obtained at final exam is influenced by other factors in addition to the time spent, the latter having little influence on that degree.

Indicators are automatically calculated in the platform through automatic collection of information and data, users have to complete some questionnaires not leave a feedback or.

6. Conclusions

Applications in M-Tourism education are necessary because many factors such as:

- anytime and anywhere access to courses and tests;
- lack of time for tourism staff;
- ease of accessing information through mobile devices;

Mobile applications are geared toward citizens and especially the educational environment becomes custom applications meet user requirements and performs functions according to user profile. Adjustment for profile is used as both vocabulary and categories of users that diversity levels. Thus in the same category of users are subcategories of users. There *waiter* category has three subcategories: *terrace waiter*, *waiter restaurant* and *waiter experienced* for 5-stars hotel restaurants.

Applications developed for the m-education are built in modules so that future development of the application to be able to do both vertically by adding new modules and vertically by adding new sub modules.

Mobile applications will grow in importance for the training and qualification executants that if they have something not clear are trained accessing lesson by phone.

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