SERIOUS GAMES IN SUPPORT OF SMEs' INTERNATIONALIZATION

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Abstract
This paper presents a Serious game platform designed both for managers of micro, small and medium sized companies intending to do business internationally and higher education students planning to become future entrepreneurs. The 3D serious game available online and for cell phones will provide the above mentioned target groups with language knowledge and skills needed for accelerating the process of internationalization. It consists of six scenarios in the areas of pre-internationalization, international networking, business culture, market and innovation and legal environment in seven languages. The content and structure of each scenario is described in details as well as the knowledge and skills expected to be acquired. In addition, the paper lays special emphasis on the importance of serious games as an innovative training tool in the area of vocational education and views the obvious advantages for potential trainees.

Key words: *serious game, online platform, SMEs, internationalization, language knowledge, six game scenarios*

1. Introduction

Internationalisation and international entrepreneurship among small and medium sized enterprises (SMEs) is a topic of considerable relevance, principally owing to the observed growth effects of cross-border venturing, and the demonstrated capacity of SMEs to drive economic development at national, regional, and global levels. European Commission, 2007). SMEs are affected by globalization and thus being increasingly forced to think and act internationally. SMEs' internationalization no longer has a limited focus on exporting/importing, but has become much more differentiated business activity encompassing subcontracting as well as technical or commercial cooperation. SMEs may be engaged in cross-border partnerships and foreign investments to capitalize on new opportunities.

Despite various merits of internationalization at firm-level which may eventually translate into improved economic performance at national and European level sometimes international transaction do not take place because firma are not able to overcome the barriers associated with internationalization. SMEs may for example be kept from internationalization due to a lack of financial and human capital resources and because they are vulnerable to conditions and changes in the external environment. Therefore it is important to gain insight in the type of barriers that SMEs may encounter either before or during internationalization. Enterprises that are not yet active in the international market may underestimate some barriers and overestimate others.

A distinction is made between internal barriers related to the capabilities of the firm and external barriers related to the business environment. The two types of barriers are closely related. Some of the most important barriers, detected by a number of studies, to SMEs with plans to internationalize are as follows: lack of qualified human resources, lack of adequate information, other laws and regulations in foreign countries, cultural differences (incl. business culture), lack of knowledge of foreign markets and foreign languages, etc.

2. Serious game platform

The European project GABALL offers micro, small and medium sized companies having plans to become internationally active a Serious game platform as a training tool for facilitating the process of their internationalization. The interactive online platform available on PC and mobile phone is

developed within an international partnership of 6 countries (Portugal, Spain, Greece, Bulgaria, Lithuania and Brazil). It consists of six scenarios based on professional real-life situations and contexts of interaction available in English, Portuguese, Spanish, Greek, Bulgarian, Lithuanian and Brazilian Portuguese.

The main objective of the game is to develop language and internationalization competences and skills for small and medium sized enterprise (SME) managers and higher education students considering becoming entrepreneurs. The game is based on a single-player, RPG-adventure mix type approach where players control the character of a manager that has to complete different challenges to arrive successfully to the end.

The background story is of an entrepreneur that wants to internationalize his/her company into a specific market (Europe, Brazil). When the player starts the game he can choose between six different scenarios:

Area: Pre-Internationalization / Situation: Diagnostics, Consciencialization

Area: International Networking / Situation: Participation in fairs

Area: Culture / Situation: Business and local culture

Area: Market and Innovation / Situation: e-Marketing and e-Commerce

Area: International Networking / Situation: On-line communication and collaboration

Area: Legal environment / Situation: Institutional negotiation

Each scenario is independent, and is expected to take about one hour to be completed. Players can follow any scenario at any given point, and their status in each scenario is saved so that they can interrupt it, start a new one, and then restart the previous one where he/she left. They can also opt to reset a scenario and start from the beginning. Each scenario is composed by 4 to 6 locations, each corresponding to a horizontal scrolling background, containing characters and/or items.

In each location there will be 3 to 4 challenges for the player to overcome, which can consist, for example, of speaking with other characters, interacting with the environment or solving custom mini-games. In order to progress to a new location the player must complete all the challenges of the current one. After 3 failed attempts to complete a challenge, a tip will be available to the player. The player will receive a score in each challenge which will add up to give the player the complete score for each scenario. This way the player can repeat a scenario to achieve a higher score.

There is no losing situation. The player can always progress through the tip system. However the score reflects the choices of the player. In each challenge he receives an explanation on what he/she should have done, so that he/she can learn and score higher in the next attempt.

The game adopts a first-person point of view (POV), although it is possible to adopt a different perspective during the custom mini-games. The game play style is based on a mix between a point & click graphic adventure, a visual novel, and an RPG.

The game design style is based on a combination of photo realistic backgrounds and rendered 3D models of characters and objects. The idea is to get an environment as close as possible to reality but give the feeling of a game, at the same time.

The game will be available in multiple platforms, like mobile devices (iOS and Android), desktop and online platforms.

2.1.Game play

Navigation and controls

- Common

- Drag to scroll screen inside locations;
- Click to interact with characters and objects or select menu / dialogue options.

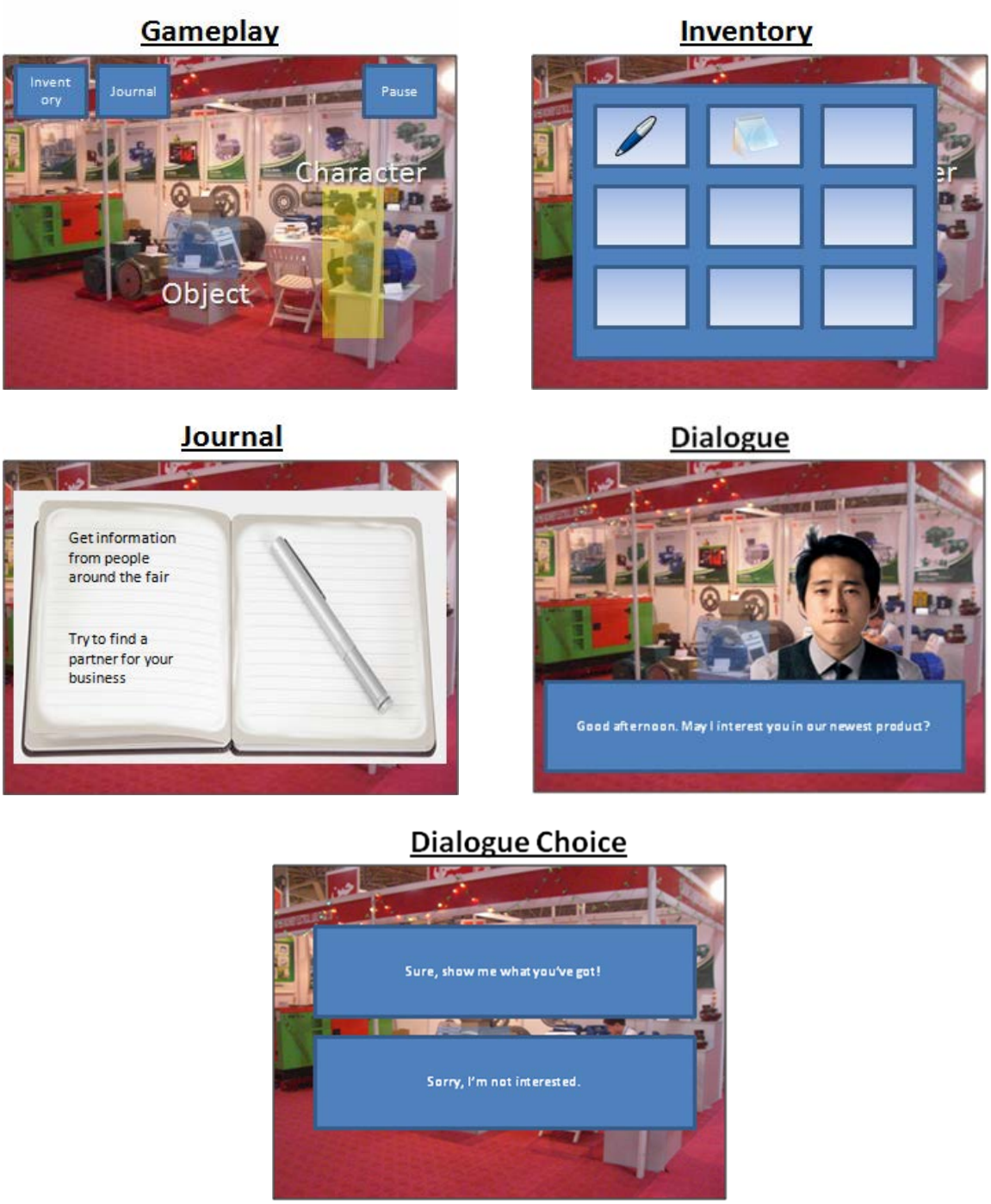
- Desktop or Web

- Mouse based.

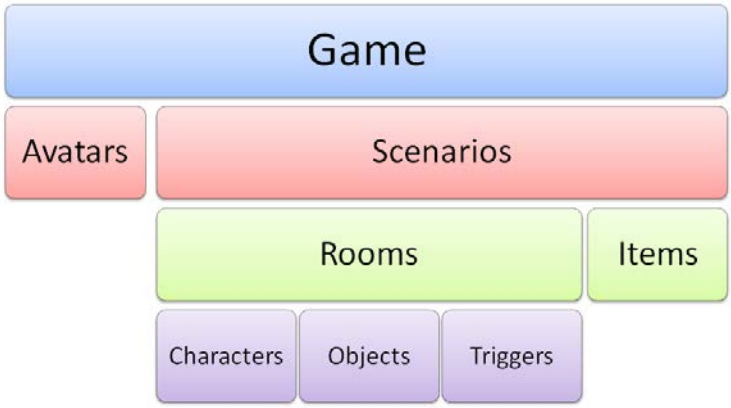
- Mobile

- Touch based.

Screen outline



Game components



Game engine and other development tools

- Unity3D
- C#
- .NET Framework
- Windows Forms
- Microsoft Visual Studio
- Git / BitBucket
- Audacity
- Blender

Assets requirements

- Background

- The background artistic photo style will be decided by the designers, upon testing.

- Graphics

- Images in PNG with a maximum size of 2048x2048 each. However, the background will always have 2048 pixels (height) but can have more than 2048 pixels wide to allow scrolling.

- Sound

- Sound files in WAV with a sampling rate of 44.1 KHz and bit depth of 16-bit linear.

- Video

- AVI format with the highest possible quality.

- 3D Models

- 3D Models should be supplied as backup for rendered images of objects and characters. Format should be .3ds or in an equally largely accepted format.

System requirements (minimum, recommended)

- Desktop

- Windows XP or later;
- Mac OS X 10.5 or later;

- Linux: official support for Ubuntu 10.10 or later, but also runs on other distros.

- Web

- Runs on all browsers, including IE, Chrome, Firefox, and Safari, among others.

- Android

- Android OS 2.0 or later;
- Device powered by an ARMv7 (Cortex family) CPU.

- iOS

- Virtually any iOS device.

Setup procedures

- Desktop

- Regular desktop application installer.

- Web

- Install the Unity3D Web Player plugin and play directly from the browser.

- Android / iOS

- Get application from the store and it's ready to use.

2.2. Knowledge and skills

The game aims at acquiring the following skills:

- Individual excellence

- Integrity and trust (IE): Scenarios: 3, 5
- Managing relationships (IE) Scenarios: 3, 5, 6
- Negotiating (IE) Scenarios: 2, 6
- Customer focus (IE): Scenarios: 2
- Listening (IE): Scenarios: 1, 3, 6
- Managing vision and purpose (IE): Scenarios: 1, 2, 4, 6 .

- Operating Skills

- Organizing (OpS): Scenarios: 2, 4, 6
- Planning (OpS): Scenarios:2, 6
- Managing through processes and systems (OpS): Scenarios:2, 3, 4 ,6

- Organizational Skills

- Presentation Skills (OgS): Scenarios: 2, 3, 5,
- Written communications (OgS): Scenarios: 2, 3, 4, 5

- Strategic Skills

- Technical learning (SS): Scenarios: 2, 3, 4, 5
- Functional/technical Skills (SS): Scenarios: 4, 5

- Results

- Action Oriented (R): Scenarios: 2, 3, 6

- Drive for results (R): Scenarios: 1, 2, 3, 4, 6

2.3. First scenario Pre-Internationalization

This scenario is meant as a diagnostic of the entrepreneur and his/her company. It will allow him/her to assess his/her competences and skills, analyze if the company is already in a situation suitable for internationalization, understand if the internationalization objectives have been well defined and if the challenges were accurately anticipated and measured. At the end of this scenario, the player will be able to

- assess if he/she has the main intercultural, languages, communication, personal and social competences and skills to internationalize the company;
- recognize which competences and skills he/she must improve;
- understand the need to be able to use communications systems and have foreign language abilities;
- understand which human resources are necessary for internationalization.

The player will progress through 9 different challenges. Each challenge is scored in percentage and they all have the same weight. The final score is the average of the individual challenge scores.

In the end the player receives a report about his/her performance and relates it to the choices he/she made. S/he receives a recommendation to restart the scenario or to follow another scenario.

2.4. Second scenario Participation in fairs

The scenario aims to make entrepreneurs planning to attend an international fairs aware of various aspects of the participation (such as evaluation of the appropriateness, and effectiveness of the participation, knowing how to advertise the participation, looking for funding opportunities, making contacts with the organizers of the fair, making arrangements, negotiation, application for stands, logistics). At the end of this scenario, the player will be able to:

- assess the appropriateness of the event and the effectiveness of the participation, and make an informed choice (based on the information gathered and the assessment carried out);
- assess if he/she has the required communication competences and skills to contact the fair organizers and setup the companies' presence;
- understand the major logistic skills and competences required for an efficient participation in the fair; assess if the company has the required human resources for it;
- understand the process of finding the resources needed (funding, logistics, stand design etc.);
- successfully communicate with different business representatives such as fair organizers, logistic companies, fair participants, etc.

The player will progress through 4 different locations and 10 different challenges. Each challenge is scored in percentage and they all have the same weight. The final score is the average of the individual challenge scores. The player may proceed to the next challenge after having successfully completed the on.

In the end the player receives a report about her/his performance and relates it to the choices s/he made.S/he receives a recommendation to restart the scenario or to follow another scenario.

2.5. Third scenario Business and local culture

The scenario aims to make entrepreneurs planning to internationalize their business aware of various aspect of the business culture (such as greetings, gift giving, dress code, communication styles, meetings and negotiations) of Bulgaria, Greece, Lithuania, Portugal, Spain and Brazil. Furthermore, very basic foreign language knowledge will be acquired. At the end of this scenario the player will be able to:

- understand basic words and expressions in Bulgarian, Greek, Lithuanian, Portuguese and Spanish;

- use basic words and expressions in Bulgarian, Greek, Lithuanian, Portuguese and Spanish in relevant business situations;
- understand cultural differences in business: greetings, gift giving, dress code, communication styles, meetings and negotiations;
- successfully communicate with different business cultures in order to facilitate the internationalization of own business.

The player will progress through 4 different locations and 8 different challenges, including a mini-game. Each challenge is scored in percentage (different for each challenge). The final score is the total amount of percents gathered through the challenges.

There should be an additional bonus system. If a challenge is successfully completed (without any mistakes), the player receives a souvenir from the respective country. The souvenirs are put in a basket which is positioned at the top on the right. A maximum of 8 souvenirs can be collected through the game.

In the end the player receives a report about his/her performance and relates it to the choices he/she made. S/he receives a recommendation to restart the scenario or to follow another scenario.

2.6. Fourth scenario E-Marketing and e-Commerce

This scenario is meant for training and assessment of the entrepreneur in terms of the competences and skills in relation to e-marketing and e-commerce activities. It allows analyzing if the entrepreneur already has knowledge of these areas and guiding his decisions towards internationalization through e-commerce. Emphasis is given to both strategic planning and practical skills. At the end of this scenario, the player will be able to:

- assess if he/she has the required knowledge and practical skills about e-commerce and e-marketing;
- understand the major skills and competences required for e-commerce and e-marketing, including understanding the technical solutions available, organizing tasks and developing written communication;
- understand the tasks of each person involved in the Marketing chain, assigning tasks according to their skills and roles. This gives assignments a managerial aspect focused on organizational skills and on the drive for best results;
- assess technical knowledge related to e-Marketing and e-Commerce;
- understand the major steps in the process of setting-up an e-commerce website.

The player will progress through 2 different locations and 8 different challenges. Each challenge is scored in percentage and they all have the same weight. The final score is the average of the individual challenge scores.

In the end s/he receives a recommendation at the end to restart the scenario or to follow another scenario.

2.7. Fifth scenario On-line communication and collaboration

The goal of the scenario is to promote the competences and skills necessary for a successful on-line communication and collaboration in business internationalisation. It will also promote language competences and technical and non-technical skills like time management, use of communication tools (phone, fax, e-mail, video conference, on-line conference devices, blackboard, etc.), information management, etc. At the end of this scenario the player will be able to:

- use appropriate language courtesy in the communication with clients and customers;
- use some language expressions in the communication;

- communicate through ICT tools;
- write some basic communication papers;
- manage the information in the communication process.

The player will progress through 2 different locations and 4 different challenges. Each challenge is scored in percentage (different for each challenge). The final score is the total amount gathered through the challenges + the mini-game.

There should be an additional bonus system. If a challenge is successfully completed (without any mistakes), the player receives a new communication tool: after successful completion of 1st challenge: e-mail, after successful completion of 2nd challenge: skype and after successful completion of 3rd challenge: collaborative tools: blackboard.

In the end the player receives a report about his/her performance and relates it to the choices he/she made. Eventually s/he will receive a recommendation to replay the scenario to improve the competences acquired.

2.8. Sixth scenario Institutional negotiation

This scenario is very much dependent on the reality of Brazil, the target region and language. The chosen state is Rio Grande do Sul and the action will take place in Porto Alegre and Pelotas where the player is setting up his/her investment. The player avatar should look for specific entities and documents in those entities. He tries to complete a process of registering a company but he finally realizes that it is a legal nightmare. Therefore he realizes that he must find help from a local consultant. The goal of the scenario is precisely to show that local support is almost compulsory for success. The scenario will combine some available information with these tips on how to proceed. At the end of this scenario, the player will be able to:

- understand the legal and financial requirements to setup a company in Brazil;
- understand the need to have local contacts to help in establishing the company;
- be familiar with the practical requirements to do it;
- develop Brazilian Portuguese language skills (level A1).

The player will progress through 8 different challenges. Each challenge is scored in percentage and they all have the same weight. The final score is the average of the individual challenge scores.

In the end the player receives a report about his/her performance and relates it to the choices he/she made. S/he receives a recommendation to restart the scenario or to follow another scenario.

3. Conclusion

GABALL serious game platform will respond to the crucial learning needs for SME's internationalisation in an innovative way. It promotes more learning conductive environments at the workplace, work-placed training and learning pathways, as a basic for development of vocational skills relevant to the labor market needs in a globalized world era.

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