



## 05. Model

Project title

**A European Business Game to train and guide students and young unemployed on entrepreneurial, transversal and mathematical skills**

**Deliverable**

O5

**Coordinator of the deliverable**

FPM

**Date of preparation**

17/05/2017

**Nature of the deliverable**

report

<b>Title of annex 05 Model</b>				
<b>Document Information</b>				
<b>Associated package</b>	<b>work</b>	O5		
<b>Beneficiary responsible</b>	HRW			
<b>Responsible Author</b>	<b>Name</b>	Jan Pawlowski, Thomas de Fries	<b>E-mail</b>	Thomas.de-fries@hs- ruhrwest.de



Play4Guidance has been funded within the framework of the European Union Erasmus+ programme

Page 1 of 69



## 05. Model

	<b>Partner</b>	HRW	<b>Phone</b>	xxx
--	----------------	-----	--------------	-----





## 05. Model

### Content

1. Introduction & Motivation .....	5
2. Preparation.....	8
2.1 Getting familiar .....	8
2.1.1 P4G Aim.....	8
2.1.2 Minimum Requirements .....	8
2.2 Designing a P4G learning scenario .....	17
2.2.1 Learning scenario contents .....	17
2.2.2 Context.....	18
2.2.3 Skills selection .....	20
2.2.4 The pedagogical approach.....	32
2.2.5 Innovation of the P4G BG - The evaluation tool .....	33
2.2.6 Evaluation of the assessment.....	34
2.2.7 Additional learning scenario contents.....	35
2.2.8 Organization-operation planning.....	36
3. Play & Perform.....	39
3.1 Game .....	39
3.1.1 Introduction to the use of the software system.....	39
3.1.2 The companies' activities (Decision Making) .....	43
3.1.3 The market analysis .....	45
3.1.4 Experiences with the game .....	47
3.2 Toolkit.....	48
3.3 Assessment.....	52
3.3.1 Calculation of the user's score .....	53
3.3.2 Experiences with the automatic assessment tool.....	64





## 05. Model

3.4	Reflection / Lessons learned .....	65
4.	List of Table & Figures.....	67
5.	References .....	69





## 05. Model

### 1. Introduction & Motivation

The Play4Guidance (P4G) MODEL represents the reasoned synthesis of the experience gained in 3 years of the project and 2 years of testing of the P4G Business Game (BG). The P4G BG is a tool for training and guidance on entrepreneurial and mathematical skills. The simulation, along with the supporting toolkit, is available free of charge from the [www.play4guidance.eu](http://www.play4guidance.eu) platform.

Since the financial crisis in 2008 at the latest, entrepreneurship has grown enormously in importance. In order to reignite the entrepreneurial spirit, the Entrepreneurship 2020 Action Plan has been established by the European Commission (European Commission, 2014). The Aim: To bring Europe back to growth and higher levels of employment.

But what exactly is entrepreneurship at all, what competences does an entrepreneur need and how can these competences be taught?

At this point the project **Play4Guidance** starts: it is an international project that introduces an innovative Business Game with the aim of training and guiding students and young unemployed on entrepreneurial, transversal and mathematical skills. Innovative learning methods reinforce managerial, entrepreneurial, digital and collaborative competences, and promote critical thinking, problem solving and leadership.

Within this project, a team from Bulgaria, Germany, Greece, Ireland, Italy and Turkey, an interdisciplinary team of different organizations, above all Education & Business, has developed numerous resources to support the development of competences as best as possible.

**This document is a combination of the most important results and is intended primarily to assist teachers and trainers in the teaching of entrepreneurial skills.** For this reason, the document was split up in two parts:

First the [Preparation](#) phase which aims to provide information on how to build entrepreneurial learning scenarios. To get familiar with P4G, first the **aim and minimum requirements** are outlined. The next part focusses on the **creation of learning scenarios**. It is about the **context** in which learning scenarios are conceivable, which **competences** can be taught and which **pedagogical approach** lies behind the competences. In addition, examples of **learning activities** are given.

The second phase is the [Play & Perform](#) part that introduces the game itself by showing the **use of the software system** and the most important contents like the **companies' activities** and



## 05. Model

the **market analysis**. Additional materials to support the learning process are combined in the **toolkit**. The last part of this section is the **assessment** of the user’s competences.

The following Figure shows the structure of the chapters as well as the linked resources:



Figure 1 - Structure



## 05. Model

The chapters are supplemented with personal experiences of the project participants as well as experiences from two pilot phases that took place during the project and evaluated the individual project components.





## 05. Model

### 2. Preparation

The preparation phase provides an introduction to P4G, in addition, the individual steps for creating own learning scenarios are enumerated and explained in detail.

#### 2.1 Getting familiar

In order to get a general overview about the P4G Project and the P4G BG as well as the related resources, the aim of P4G and the minimum requirements that are needed to get started will be explained. Therefore, general information about entrepreneurship, the game and the assessed competences are provided.

##### 2.1.1 P4G Aim

P4G aims to bring the world of education and training in close contact with the job market, in order to match school and university curricula to the market's real needs.

Furthermore, the project aims to boost entrepreneurial culture in young Europeans and help young Europeans acquire the skills needed to create new businesses. This will potentially contribute to a reduction in EU unemployment.

In addition, P4G aims to identify essential business skills among target groups and target countries and collect them in the Great Common Denominator Matrix.

Play4Guidance produces an effective European tool able to:

- Support students and unemployed in developing basic math, economic, digital and entrepreneurial transversal skills with a strong focus on problem solving and leadership.
- Allow students and unemployed to self-evaluate their skills, understand what being an entrepreneur means and realise what skills they need to improve on.
- Support various institutions such as guidance centres, job centres, SMEs, companies and universities in evaluating participant skills and guiding them through training and skill-building.

##### 2.1.2 Minimum Requirements

This topic offers a short introduction about entrepreneurship, (how to play) the game and the 10 competences assessed by the game.







## 05. Model

### 2.1.2.1 Entrepreneurship

Entrepreneurship is conceptualized as a group of people, who take advantage of a business opportunity, manage means, time and resources, apply management processes to create products or services to meet certain needs and achieve a financial result. In general, the company aims to meet people's needs and find effective solutions to cover them.

**Accordingly, entrepreneurship is the art of finding effective solutions to meet people's needs, more quickly and more economically, in a competitive environment.**

Entrepreneurship refers to any business venture that aspires to turn an idea into a profitable business. However, successful entrepreneurship involves much **more than having a great idea**; that's just one part.

An entrepreneur is a **creator, doer, pioneer of change** and most importantly a **collaborative and communicative gamer** who manages the overall control of the business and **inspires** his/her co-workers. The entrepreneur should be trained to take decisions not only based on current fiscal and market facts but be able to apply forward thinking and predict future market needs.

An entrepreneur must be equipped with a set of certain skills that will enable him/her to turn his/her idea into reality and finally reach the market.

An Introduction video on Entrepreneurship can be found here:

[Introduction](#)





Figure 2 - Introduction video on Entrepreneurship

### 2.1.2.2 About the game

In the P4G game, each team / player manages their **own virtual T-shirt Company** and compete with the other teams.



*Figure 3 - Play the Game Icon*

P4G is a simulation game with the task of **managing the individual strategic views of the company** that compete with another on the market. It transforms raw materials into end products, companies buy raw materials from suppliers and try to sell finished products to customers.

The objective of the game is to **maximize the value of the company**, which is assessed in terms of business margin, recruitment policies and the growth rate of the company's investment and financial results.

### *2.1.2.3 How to Play*

The game consists of **12 rounds**, which show the activities of the companies and the market for 1 year. On each move, each team, parallel to the other, analyzes the current situation of the company and the market quantitatively through a set of "status" variables that describe the company's situation.

The player decides on the operational and strategic leadership of the company, distributes **quantitative values** to a set of "inputs"; These decisions together with the decisions of other



## 05. Model

teams and a set of control parameters assigned by the game manager determine the new situation of the company and the market.

A 'How to Play' video guide can be found here: [How to Play](#)



Figure 4 - Quick guide video

The **detailed rules** can be found in chapter 3.

There are 2 forms of evaluation tools used in the P4G Game: The most important one is the **internal evaluation tool** which is embedded in the game itself and assesses the **10 most important entrepreneurial competences**.

### 2.1.2.4 10 Assessed Competences

The user's decisions are registered during the game and explicit feedback on the user's strengths and areas that need improvement is provided.





## 05. Model

The assessment report from this tool covers **10 competences** on which the players are going to be assessed by the game:

1. **Analytical Thinking:** The ability to analyze problems systematically.
2. **Business Acumen:** The ability to discover opportunities and transform resources into performance.
3. **Commitment to Learning:** The ability to actively pursue learning and develop competitiveness.
4. **Order and Quality:** The ability to reduce uncertainty and to control quality.
5. **Expertise:** The ability to perform professional jobs.
6. **Flexibility:** The ability to effectively adapt to a variety of situations.
7. **Information Seeking:** The ability to find and capture information to increase knowledge or find solutions.
8. **Innovation:** The ability to create something new on the basis of which to launch a proper business
9. **Results Orientation:** The ability to set performance objectives, resulting targets and measures.
10. **Decision making:** The ability to make decisions.

Explanatory Videos on the 10 competences can be found here: [10 Competences](#)





## 05. Model





1		<b>01 Analytical Thinking P4G</b> Play4Guidance Project	1:50
2		<b>02 Business Acumen P4G</b> Play4Guidance Project	1:48
3		<b>03 Commitment to Learning P4G</b> Play4Guidance Project	1:47
4		<b>04 Order and Quality P4G</b> Play4Guidance Project	1:55

Figure 5 - Videos on the 10 competences (4 shown)

The 10 most important competences are based on an initial skills matrix that sets skills standards among target groups and countries. This **Greatest Common Denominator Skills Matrix** will be explained in detail in **Chapter 2.2.3.1**.

The following basic scenario shows the simplest way of playing the P4G Business game without assistance

### 2.1.2.5 Basic Scenario

The simplest and most direct way of using the P4G BG is the single player mode. This case is when a user goes to the online simulator and tries to play without any guidance or assistance from anybody (teacher, VET professional, etc) and outside of any learning path. ([Link to the Game](#)).

After the registration process (described later in 3.1.1) the user starts to play.

## 05. Model

First of all he/she has to analyze the current situation of the company and the market, quantitatively specified by a set of "status" variables that describe precisely the situation of the company.

It is very important that the player is aware of the 'current situation' of the company and the market.

The variables are grouped in 3 main areas: supply management, production management, marketing and sales management. It is very important to understand the key variables in each area. For example, in the first area the player has to decide how much raw material to buy and in the second one, production management, how much raw material works; these two decisions should be related because you can only work with the quantity of material that you have!

So, it is fundamental for the player to analyse the 'Current situation' in depth, where he/she can find all the necessary information to play in a good way!

Using the tab 'Current situation' players can see the different values of the variables in that round.

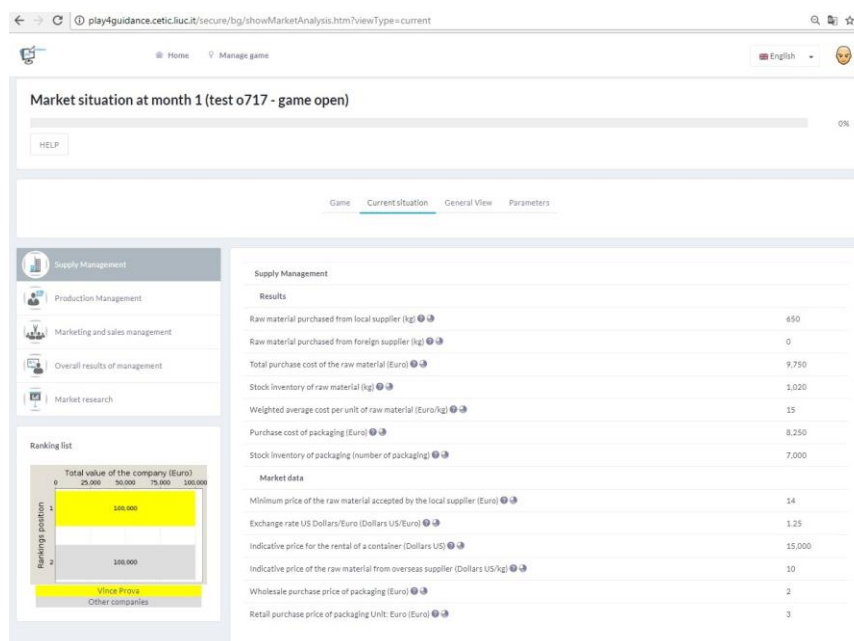


Figure 6 – Current situation tab

The tab 'General view' shows the evolution of the values of the variables round after round.

## 05. Model

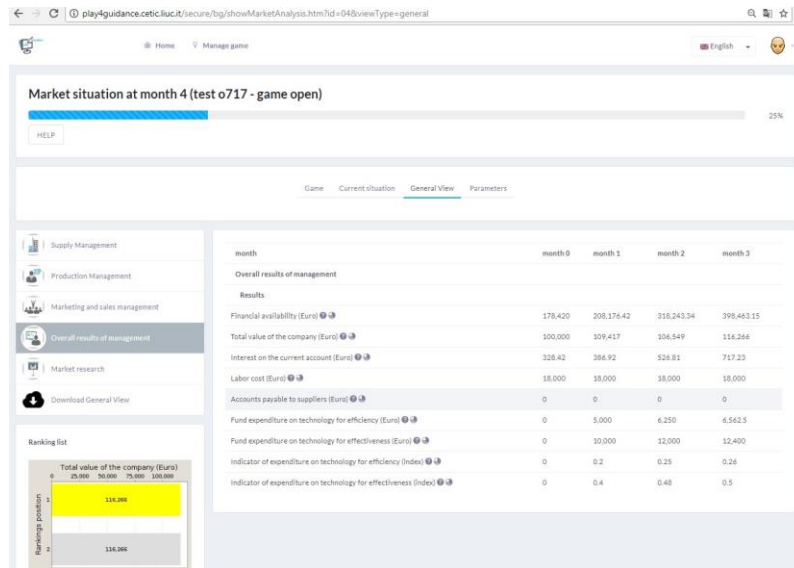


Figure 7 - General view tab

The tab 'Parameters' shows all the fixed and variable parameters of the game.

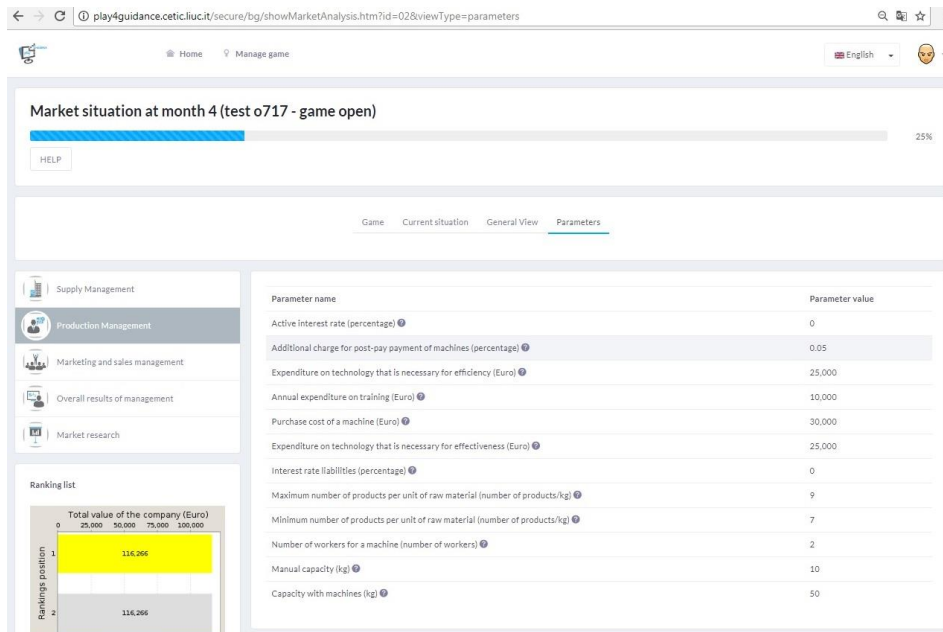


Figure 8 - Market situation tab





## 05. Model

When you play 'alone' it's fundamental to be aware of the content of these 3 tabs in order to take sensible decisions!

After the analysis of the market the player must make his decisions using the tab 'Game'.

Now he/she should have all the information about the company and the market to make smart decisions assigning quantitative values to the set of input variables.

In any case, at the side of every variable, there is a clickable question mark that displays a text explanation of the meaning of the variable.

In order to use the scenario in the teaching context, comprehensive learning scenarios can be designed. The following chapter describes the implementation of such scenarios.

### 2.2 Designing a P4G learning scenario

Scenarios are templates for using the P4G BG in different contexts or learning situations. The following chapter will outline the most important scenario components. First of all, the **context** for the scenario will include possible target groups. The addressed competences as well as the educational approach will be combined in the **skills** chapter. The **content** chapter consists of different learning activities, roles and tools that need to be defined in the learning scenario. The **organizational framework** of the learning scenario is defined in the last chapter.

#### 2.2.1 Learning scenario contents

Scenarios are templates for using the P4G BG in different contexts or learning situations. Each scenario should help trainers and educators to develop their own scenario (or lesson plan) for their concrete context.

Each scenario should contain the following aspects:

- **Title**
- **Context:** For which context and target group is a scenario suitable? Details and examples can be found in **Chapter 2.2.2** .
- **Competences:** The Business Game covers a variety of competencies. Here, it is explained which competencies are addressed in the scenario. For details about the competences have a look at **chapter 2.2.3** .





## 05. Model

- **Educational Approach:** The overall approach and underlying educational principles / theories / methodologies are explained. Details can be found in **chapter 2.2.4** .

### **Additional contents: (Details in chapter 2.2.7):**

- **Learning Activities:** In this part of the scenario, examples of learning activities (similar to a lesson plan) are given. These are not limited to the game but can also cover a broader range including other lessons (e.g. using Open Educational Resources to prepare learners for the game).
- **Roles** describe which people are needed for a scenario – this can include teachers, moderators, tutors, learners
- **Tools and services** describe which tools (besides the business game) are necessary to run a scenario (e.g. blog, authoring tool, learning management system)

### 2.2.2 Context

The P4G BG can be used for different target groups in different scenarios. During the project the focus was on **direct and indirect target groups**.

Direct target groups:

- High school students
- University students
- Young unemployed

Indirect target groups:

- Guidance centres for students
- Schools
- Teacher training centres
- Research centres
- Policy makers
- Industry unions
- Employment centres





## 05. Model

- Companies
- Small and medium-sized enterprises

Depending on the structure of the learning scenario, there are a large number of possible applications and target groups. In the following, examples are given in which context and for which target groups an application is conceivable.

Context	Target Group	Comments / Experiences
Entrepreneurial Skill Building Workshop	Post primary students	In the context of post primary students, the game was wrapped in an entrepreneurial skill building workshop and language used was aligned with the business studies curriculum so that students could relate to the game and the objective. Furthermore, the Business Model Canvas was integrated into the workshops to give the students a strategic tool to help them with managing their own virtual t-shirt company
Final event of a brief path about entrepreneurship.	High school students	The teacher held some classes about the topic; after these classes the students saw some P4G introductory videos.
Educational scenario for entrepreneurship	University students	The educational scenario explored the operation of a well-known Greek tobacco company and the users tried to relate some parameters of the business to their virtual company.
Educational Scenario "Making ends meet"	Unemployed and university students	Train how to start and manage a new business. The scenario addresses the authentic situation of the current difficult financial state of several European countries and aims to train and guide users in managing a start-up business throughout an economic crisis.
Educational scenario "Transition Year Entrepreneurship"	Transition Year students studying Entrepreneurship as part of the Leaving Certificate Curriculum	The scenario gives students the learning opportunity to experience managing a start-up business from supplier sourcing, production to marketing and sales.





## 05. Model

Educational scenario "Staff recruitment"	Owners and / or managers of companies, directors, managers and experts in human capital management.	The most valuable strategic resource of the company is its staff and the recruitment and team building are key factors for the business development. In today's dynamic conditions of globalization, scientific and technological progress and high competitiveness, an ever-greater flexibility of organizations and most of all of the work organization in them is required.
Educational scenario "Take decisions: learn how to run a company!"	Students	Students can develop these competences: Decision making, Analytical Thinking, Conceptual Thinking, Basic Competences (mathematics and finance), Self-confidence, Communication

Table 1 - Learning scenario context

The examples in this table provide an overview of possible uses. A detailed set-up of individual scenarios can be found in the appendix of the document. In the context of a learning scenario, it is also necessary to think about the **competences and learning outcomes**.

### 2.2.3 Skills selection

The skills selection chapter outlines how the 10 most important competences were explored and how they are automatically assessed by the game. In addition, the pedagogical approach behind P4G is introduced. The chapter is closed with the most important evaluation results of the 10 assessed competences.

#### 2.2.3.1 The Greatest Common Denominator Skills Matrix

To explore and understand competences for young entrepreneurs / innovators a **mixed method approach** has been applied. A **literature review** helped us to understand competence classifications and competence specifications. The key outcome was the initial competence specification based on Wu (2009) which consists of 23 competences. Generally speaking, these competences were shown all as useful with different importance.

Within the **focus groups**, we extended this competence specification by additional competences – here, three competence areas were identified which need to be specified in more detail:





## 05. Model

- Managerial competences, in particular decision making
- Thematic / domain competences (e.g. innovating in the domain of ICT)
- Basic skills (e.g. math, economics, law)

Furthermore, the importance of affective skills became clear, identifying personal characteristics such as optimism, endurance, determination, etc.

Last but not least, the focus groups determined competence proficiency levels for all competences. These can be used during the game development to specify different levels of playing as well as for assessing competences.

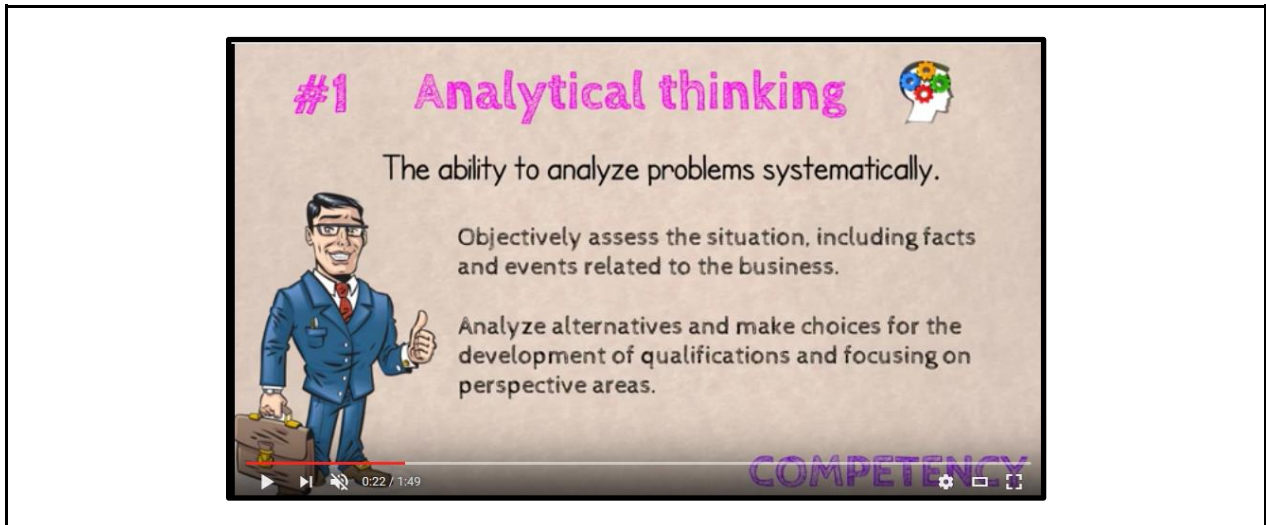
In a **survey**, the partnership has prioritized competences based on the need to develop competences further (self-assessment). We also derived desired competences.

### *2.2.3.2 The self-assessment tool*

The 25 key competences have been then analysed by the partnership in order to select those that could really be assessed directly by the P4G BG. **10 competences** have been selected and the related analytical system has been implemented in the game. At the end of each match the P4G BG is now able to return a feedback on these 10 competences: The evaluation system is based on 3 levels: "low", "medium" and "high", with a dedicated description for each of them:

#1	<b>Analytical Thinking</b>
----	----------------------------

## 05. Model



<p>Description of the competence</p>	<p><b>The ability to analyze problems systematically.</b></p> <p>Objectively assess the situation, including facts and events related to the business. Analyze alternatives and make choices for the development of qualifications and focusing on perspective areas.</p>
--------------------------------------	---

**Description of level of mastery (Weak / Average/ Good)**

<p>At peace with the situation. Waiting passively to improve the situation in the business.</p>	<p>Seek external assistance (counseling) in decision-making.</p>	<p>Analyze the situation, assess their capabilities, qualities and potential. Taking decisions to improve in line with the needs and perspectives of the market. Evaluate different alternatives, trends and patterns.</p>
---	--	--

<p><b>#2</b></p>	<p align="center"><b>Business Acumen</b></p>
------------------	--

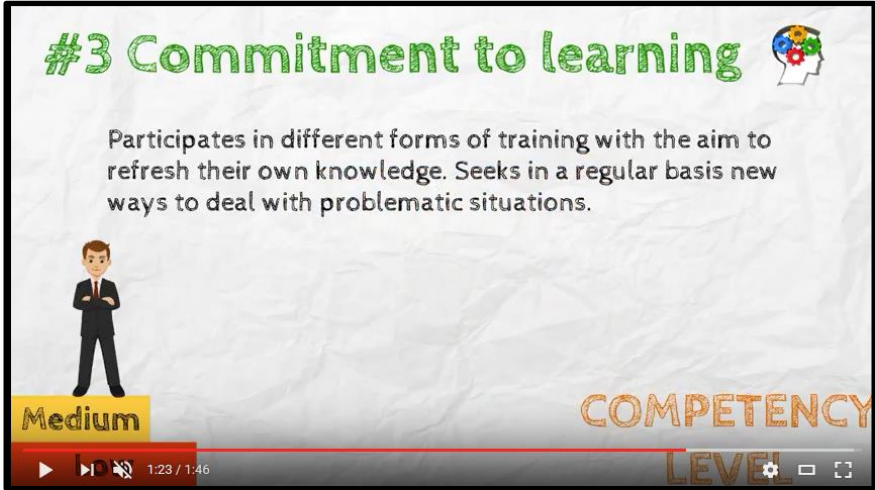


<p>Description of the competence</p>	<p><b>The ability to discover opportunities and transform resources into performance.</b></p> <p>Take matters into their own hands. Search, find and exploit new profitable opportunities for business development.</p>
--------------------------------------	---

**Description of level of mastery (Weak / Average/ Good)**


<p>Not interested and misses opportunities. Shows indecision and lack of ambition. Afraid of change and of taking responsibility. Limited autonomy, relying on the help and the activity of others.</p>	<p>Use resources to achieve moderate results. Relying on traditional methods and approach with routine. Skeptical of novelty and innovation. Not willing to risk in situations of uncertainty.</p>	<p>Not satisfied with the achievements. Drafts projects, assesses risks, plans and effective using of resources, predicts results. Shows resourcefulness, courage, innovation, proactivity and entrepreneurship.</p>
---	--	--

## 05. Model

#3	<b>Commitment to Learning</b>	
		
Description of the competence	<p><b>The ability to actively pursue learning and develop competitiveness.</b></p> <p>Proactive search and utilizing opportunities for further training, retraining and development of new skills that are needed to improve the organization and its workforce.</p>	
<b>Description of level of mastery (Weak / Average/ Good)</b>		
Relies on the current qualification.	Participates in different forms of training with the aim to refresh their own knowledge.	Identify and exploit opportunities to learn, to receive feedback and to develop by knowing well their own strengths and areas for improvement.

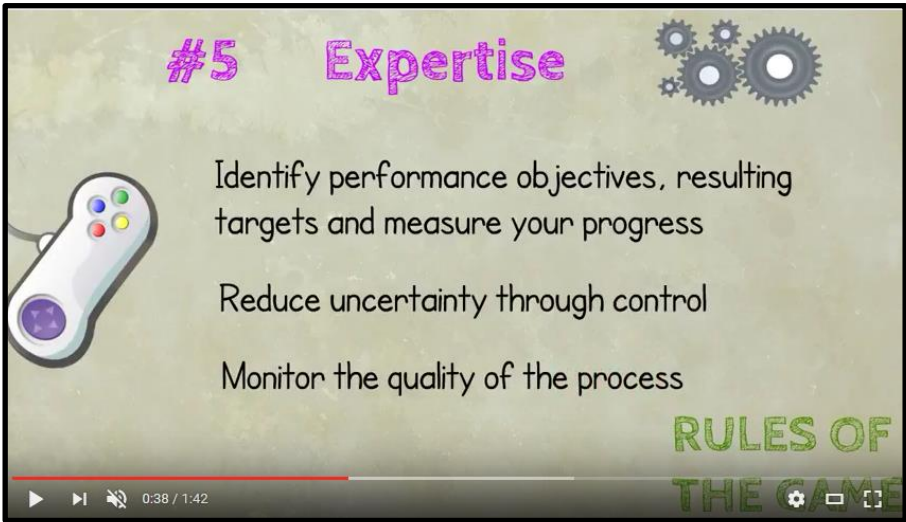


## 05. Model

#4	<b>Order and Quality</b>	
		
Description of the competence	<p><b>The ability to reduce uncertainty and to control quality.</b></p> <p>Demonstrating good organization and knowledge of business etiquette. Demonstration of readiness to reduce uncertainty, knowing and observing specific standards, rules and requirements to ensure quality.</p>	
<b>Description of level of mastery (Weak / Average/ Good)</b>		
<p>Making errors, omissions and inaccuracies in the preparation of application documents. Low culture in the implementation of business etiquette. Inability to demonstrate organization and knowledge about specific rules, standards and</p>	<p>Good organization and precision in the drafting of documents when applying for a new job. Knowledge of standards and requirements for the job. Inability to justify the role of the position in the quality management system.</p>	<p>Proactively contributing to quality in everyday situations. Demonstrating good organization, precision and personal effectiveness. Readiness to provide quality, for conscious and responsible fulfillment of the commitments taken by</p>

## 05. Model

requirements.		respecting the contractual agreements, standards, rules, terms and conditions.
---------------	--	--

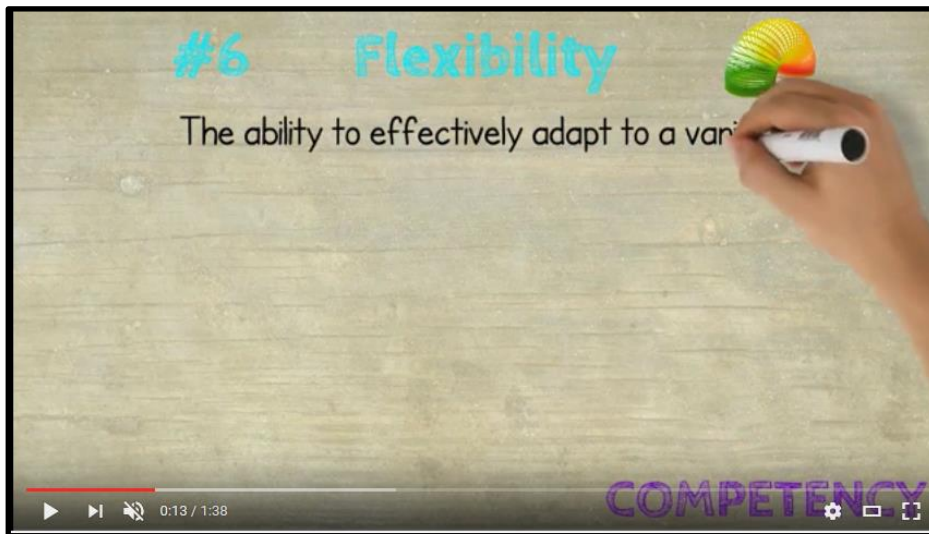
<b>#5</b>	<b>Expertise</b>	
		
Description of the competence	<p><b>The ability to perform professional jobs.</b></p> <p>Expertise describes professional competency in terms of domain knowledge and skills.</p>	
<b>Description of level of mastery (Weak / Average/ Good)</b>		
Low competence, inability to learn from the experience of others, low motivation to improve own knowledge and skills. Basic knowledge in the	Rely on routine knowledge and skills acquired in the past. Does not demonstrate readiness for professional development.	High professional competency, strive demonstrated for permanent improvement. High knowledge to solve complex

domain.

situations in the domain.

#6

**Flexibility**



Description of the competence

**The ability to effectively adapt to a variety of situations.**

Ability to effectively adapt to new situations, environments and requirements. Striving to learn new skills and requalification. Tolerance to change and vagueness

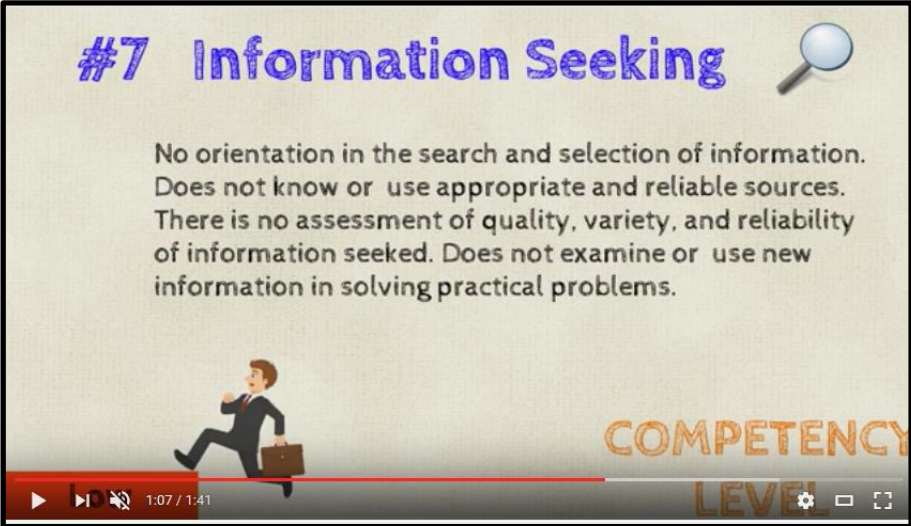
**Description of level of mastery (Weak / Average/ Good)**

Rigidity and resistance to change. Inability to adapt to new conditions.


Changing attitudes and behaviors under external pressure

Seeking change productively and adapting to novelties. Challenges are motivating

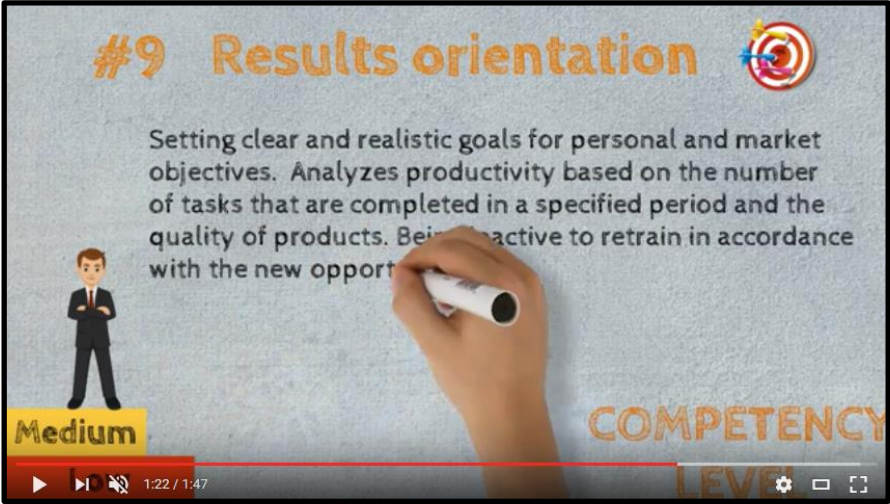
## 05. Model

#7	<b>Information Seeking</b>	
		
Description of the competence	<p><b>The ability to find and capture information to increase knowledge or find solutions.</b></p> <p>Ability to use information and communication technologies. Finding and selecting the information necessary to solve problems. Ability to select appropriate sources to collate and assess the information, and to apply it in practical terms</p>	
<b>Description of level of mastery (Weak / Average/ Good)</b>		
No orientation in the search and selection of information. Does not know and does not use appropriate and reliable sources. Does not examine and does not use new information in solving	Actively seek and select information. Not able to select and retrieve basic information.	Ability to use ICT in the daily work. Correct selection of sources of information. Ability to get oriented, to select information and retrieve data that are important for solving practical problems.

practical problems.

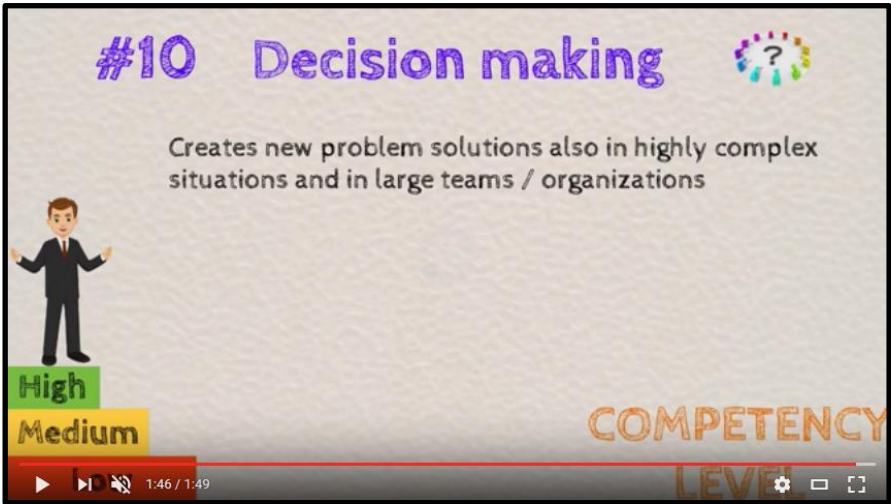
#8	<b>Innovation</b>	
		
Description of the competence	<p><b>The ability to make something new and to improve performance.</b></p> <p>Ability to create something new on the basis of which to launch a proper business project towards market maturity. Ability to show ingenuity, creativity, to generate and implement new ideas.</p>	
<b>Description of level of mastery (Weak / Average/ Good)</b>		
Lack of creative ideas and entrepreneurial spirit. Inability to shake off routine and to think	Generate innovative ideas but lacks determination and autonomy and is afraid of risk with their integration.	Actively generate new ideas and commitment to their implementation. Showing flair for new, original,

		unconventional realisation.
--	--	-----------------------------

<b>#9</b>	<b>Results Orientation</b>	
		
Description of the competence	<p><b>The ability to set performance objectives, resulting targets and measures.</b></p> <p>Setting realistic goals and taking adequate measures in the process of business and personal development.</p>	
<b>Description of level of mastery (Weak / Average/ Good)</b>		
Inability to set clear and realistic goals for personal and business development.	Setting clear and realistic goals for personal and market objectives. Being inactive to retrain in accordance with the new opportunities and demands of the market.	Setting clear and realistic goals against the personal professional qualities and the situation on the market. Actively seek and exploit opportunities with realistic

## 05. Model

		goals. to develop skills that are demanded by the labor market.
--	--	---

<b>#10</b>	<b>Decision making</b>	
		
Description of the competence	<p><b>Ability to make decisions.</b></p> <p>Ability to apply decision making models in different situations. Ability to find decision alternatives and information to support the decision process.</p>	
<b>Description of level of mastery (Weak / Average/ Good)</b>		
Basic application in small teams for simple problems	Solves problems independently also in new / uncertain situations in medium sized teams	Creates new problem solutions also in highly complex situations and in large teams / organizations



## 05. Model

Table 2 - 10 Most Important competences

More information on the competence assessment can be found here: [Assessment Final Report](#)

### 2.2.4 The pedagogical approach

The pedagogical approach of the P4G project is achieved by taking a multi-disciplinary approach to examine a set of principles which are considered from **social-cultural approaches, psychological principles, gaming experiences and the technological point of view**. The P4G online interactive space in the form of a business game is addressing both theory development issues and learning purposes.

- Social-Cultural approaches: Following **socio-cultural approaches**, online interactive environments do not exist in isolation to the real-world but rather belong within a context where actors use common-sense practices to produce, analyze and make sense of one another's actions. "Situated actions" are enrolled in doing in situ where participants act and interact within an environment (Suchman & A., 1987).
- Psychological Principles: Following a **psychological perspective**, activity is a cycle that begins from the brain and, through the body and the world (such as business world), returns back constituting knowledge. The power of cultural structure can lead to the transformation of the problem solving activity (Wheeler & Clark, 2008).
- Gaming experiences: A **gaming experience** is a playful experience that can be described through the relationships between the players' actions and the systems' reactions. Players' actions are expressed by cognitive psychological, physical and emotional dimensions. Systems reactions are specified through the rules of the games.
- Technological point of view: Following a **technological point of view**, the P4G BG "Manage your own company" is a simulation game between teams, where each team has the task of managing from a strategic point of view their own business competing with the other in a market.

Having identified the set of principles that inform and support the structure of the P4G BG it is important to consider and clarify the specific **learning objectives** that the business game addresses and elaborate on their assessment process in order to provide a route map for designers to develop the game model. This attempt addresses both theoretical and practical issues that need to be considered in order to accomplish a complete and efficient guideline template with specific learning objectives and assessment points for the P4G BG users.







## 05. Model

The **learning objectives** are the result of different data entries and research examinations. Specifically, they have been formed based on the results of the **Assessment Output** (Skill Matrix – Chapter 2.2.3), the P4G business **game characteristics** as well as the **pedagogical theory** related to online gaming which was mentioned in the first section. The identified learning objectives address two fundamental aspects of game engagement: **(1) users' skill development which concerns the behaviour/development of the players as problem solvers and (2) users' cognitive development** which is about the knowledge/learning about business and management sciences.

The P4G self-evaluation tool (Chapter 2.2.3.2) was designed and informed by taking into account both the literature review on competence classifications and specifications, and empirical research data occurring from surveys conducted in all project member countries addressing three targeted groups: unemployed, students, teachers. As a result a) the inclusion of **learning goals supported by the literature** was validated, b) the adoption of a **generic competence scheme** was enhanced to include differences between countries and target groups and c) **dimensions** such as affective skills that had been neglected in previous research on entrepreneurial skills and corresponding training concepts have sprung up.

The full pedagogical framework can be found here: [Pedagogical Framework](#)

### 2.2.5 Innovation of the P4G BG - The evaluation tool

The innovative character of the P4G BG lies in its embedded evaluation and scaffolding mechanism that provide significant guidance for the trainees. The P4G self-evaluation tool was designed and implemented on the basis of assessing: (1) players' level of the key skills and competences highlighted in the matrix and (2) players' performance in alignment with the learning objectives highlighted by the P4G Pedagogical Framework. In addition, it was designed and informed regarding both literature review on competence classifications and specifications and empirical research data occurring from surveys conducted in all project member countries (Bulgaria, Greece, Ireland, Italy, Turkey) addressing three targeted groups: unemployed, students, teachers.

The tool of self-evaluation and evaluation for guidance is designed and structured on two levels: (1) the evaluation tool operating internally and automatically as an implemented function of the P4G BG (internal evaluation tool) and (2) the evaluation tool operating externally in the form of worksheets (external evaluation tool). The former is implemented into the business game and



## 05. Model

automatically informs the P4G BG players on their performance. The internal evaluation tool appears in the form of feedback provided to participants directly on the game site at the end of the game session. In addition, users' decisions and intervention on the values of the parameters implemented in the game are registered and constantly tracked to inform them of their pace of progress and enable them to make a comparative analysis

In a pilot phase, the aim was to gather user experiences with the game and, among other things, to question whether the specified competencies were addressed. The next chapter will outline the results.

### 2.2.6 Evaluation of the assessment

The pilots to evaluate the assessed competences have shown a positive level of reliability of the P4G BG. There are some differences between the different countries involved, but this probably depends on many factors that were difficult to control during the pilots.

target groups	Analytical thinking	Business acumen	Commitment to learning	Order and quality	Expertise	Flexibility	Information seeking	Innovation	Results orientation	Decision Making	
<b>STAKEHOLDERS</b>	3,52	3,29	3,31	3,05	3,22	3,33	3,60	3,29	3,63	4,00	3,42
<b>HIGH SCHOOL</b>	3,58	3,59	3,49	3,41	3,38	3,32	3,52	3,60	3,53	3,98	3,54
<b>UNEMPLOYED</b>	3,45	3,47	3,60	3,39	3,35	3,49	3,46	3,46	3,61	3,77	3,50
<b>UNIVERSITY</b>	3,42	3,47	3,39	3,45	3,16	3,31	3,56	3,47	3,53	3,82	3,46
<b>Average</b>	<b>3,49</b>	<b>3,46</b>	<b>3,45</b>	<b>3,33</b>	<b>3,28</b>	<b>3,36</b>	<b>3,54</b>	<b>3,45</b>	<b>3,57</b>	<b>3,89</b>	<b>3,48</b>

Table 3 - Evaluation Results



## 05. Model

Detailed information about the pilots can be found here: [Pilot Summary](#)

### 2.2.7 Additional learning scenario contents

The following chapter outlines the additional learning scenario contents

#### 2.2.7.1 Learning activities

Depending on the context and the competencies to be taught, there are numerous learning activities besides playing the P4G game that can be embedded in the scenario. Besides learning activities the P4G BG can be used as an assessment tool by companies to recruit skilled employees. Possible activities are:

- Brainstorming
- Case Study Analysis
- Class Discussion
- (Preparation of) Presentation
- Paired learning
- Reflection
- Demonstration
- Tests

Detailed examples on how to embed these learning activities in a learning scenario can be found in chapter 2.2.8

#### 2.2.7.2 Roles

Before a learning scenario is implemented, it is important to think about the roles of the participants. A possible task classification could be as follows:

##### **Trainer/Teacher/Instructor:**

- Moderation of the discussion and activity tasks
- Introduction of the learning concept
- Preparation of presentations for the groups
- Solving communication misunderstandings
- Activation of students
- Evaluation of the final project outcomes and the cooperation between the students

##### **Students:**





## 05. Model

- Active participation in the learning process by expressing their ideas, experiences and opinions and by engaging in a hands on experience with the use of the business game.

An example on how to embed the roles in a learning scenario can be found in chapter 2.2.8

### 2.2.7.3 Tools & Services

Various tools and services, both internal P4G and external tools can be integrated into the learning scenario. Examples of possible services are:

- Google docs for communication purposes
- Scenario worksheets (Google / Excel to register and exchange data)
- P4G Syllabus/glossary
- P4G Skills matrix
- Technical manual of the P4G business game
- Scenario elaboration script
- Video-tutorials
- 2 Self-guidance evaluation tools
- A Course evaluation questionnaire
- Pedagogical approach of strategic planning
- Blogs
- Authoring tools
- Learning management system

These are examples from the learning scenario in the next chapter 2.2.8 . The toolkit with the linked resources can be found in chapter 3.2 .

### 2.2.8 Organization-operation planning

For the successful implementation of a learning scenario it is important to plan the scenario in advance. The agenda, sequence of activities, preparation of students, evaluation process (how to collect feedback) and the timing of process are some main points that have to be considered.

The following example summarizes the individual steps:





## 05. Model



Table 4 - educational Scenario Example



## 05. Model

Two additional learning scenario examples can be found here:

### 1. [Cross-border business development](#)

<b>1. Title of the Educational Scenario</b>	Title of the scenario  <i>Cross-border business development</i>
<b>2. Context</b>	Description of the context and situation of usage.  <i>The scenario is intended for students of information systems and business to develop innovations in international teams. The students are in the 2nd year master's level. The scenario is intended to cover about 2 ECTS = 60h workload.</i>

Figure 9 - Extract of the Cross-border business development scenario

### 2. [Take decisions: Learn how to run a company](#)

<b>1. Title of the Educational Scenario</b>	Take decisions: learn how to run a company!
<b>2. Context</b>	This scenario is suitable for students. It can be used as additional learning materials to develop specific competences.

Figure 10 - Extract of the "Take decisions" scenario

### 3. Play & Perform

After the preparation is done, the focus now is on the implementation of the scenario. The following chapter therefore deals with the actual game, the toolkit and the assessment of competences. The chapter is closed with a reflection and the lessons learned.

#### 3.1 Game

The following chapter will introduce the game focussing on the use of the software system, the companies' activities and the market analysis.

##### 3.1.1 Introduction to the use of the software system

The game takes place over the Internet and the control system of the game is available using any web browser. The Internet connection must be active for the duration of the game.

To start the game, use the following Link and follow these steps:

1. Open the link <http://play4guidance.cetic.liuc.it/>

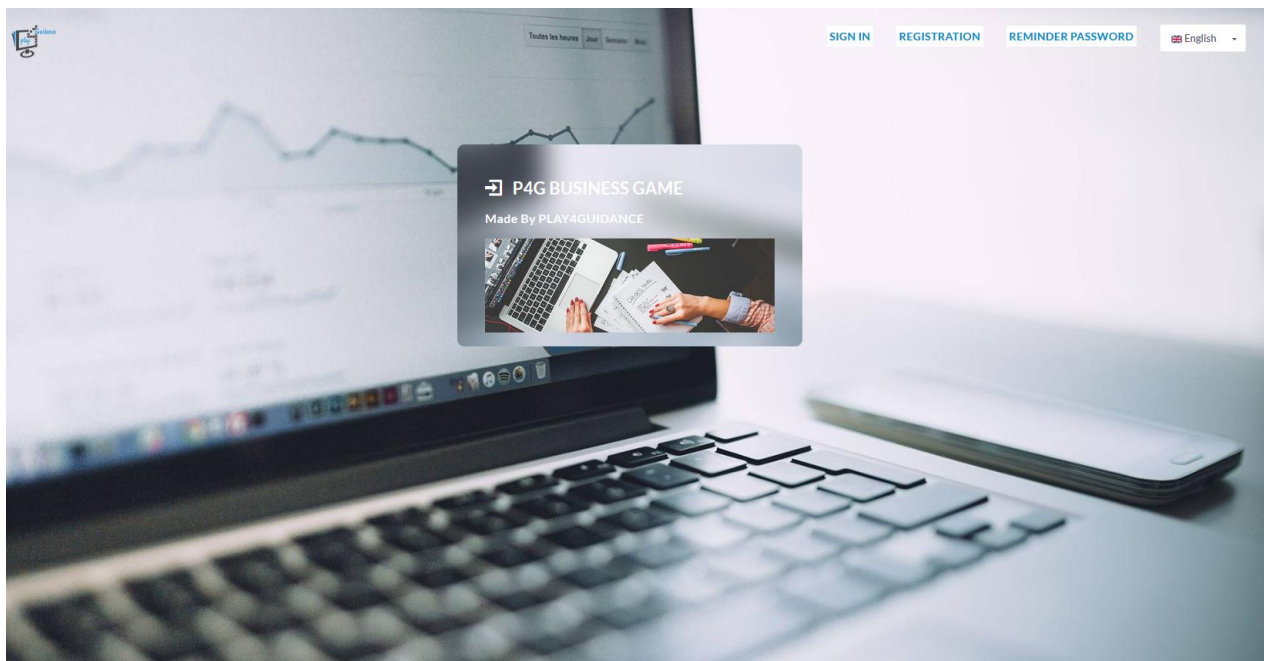


Figure 11 - Start Page

## 05. Model

- Fill in the registration data. After registration, a confirmation email will be sent in your mailbox.

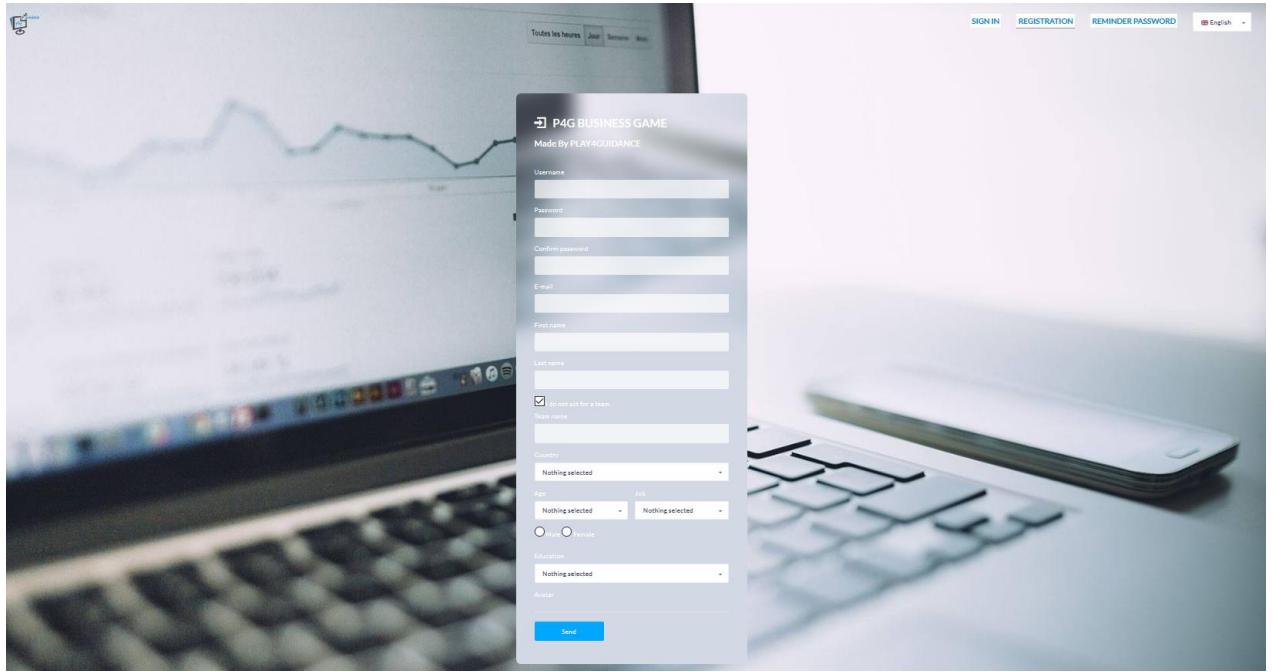


Figure 12 - Registration Form

- Login and choose the "New Game" tab. If it is your first login, you first have to create a new game.

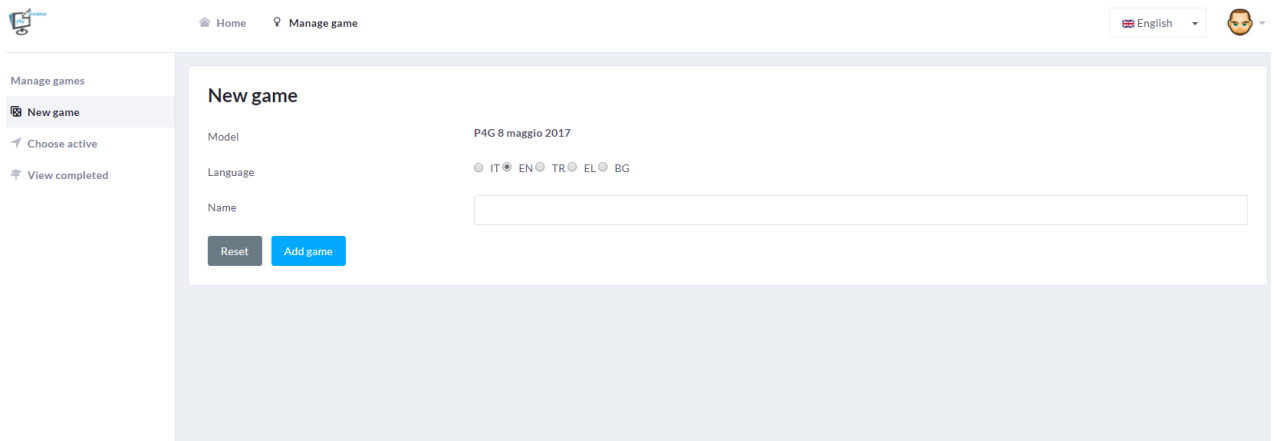


Figure 13 - New Game



## 05. Model

4. Choose your game and you will find an overview page

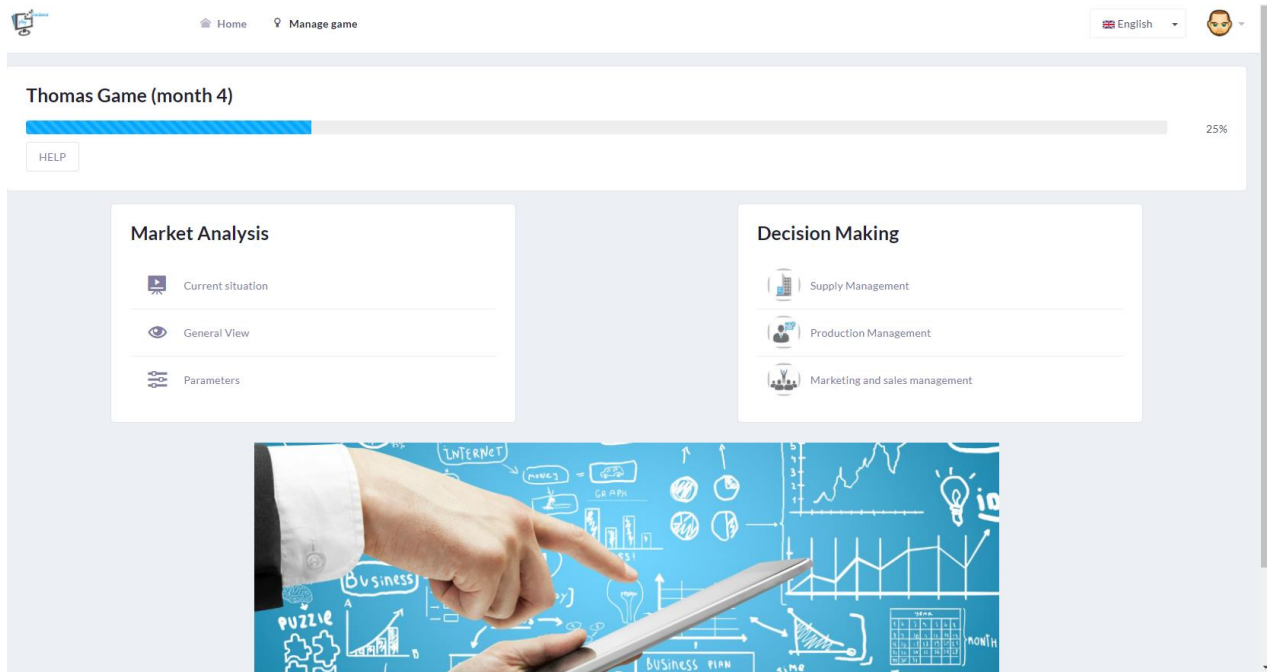






Figure 14 - Game overview

5. Analyze the current market situation and take your decisions (Details in the next chapters)

[Game](#)   [Current situation](#)   [General View](#)   [Parameters](#)

-  Supply Management
-  Production Management
-  Marketing and sales management
- Summary
-  Download Decision History

### Production Management

How much raw material will you process? (kg) <sup>?</sup>	<input type="text" value="5"/>	$x \geq 0$
Purchase of new machines (number of machines) <sup>?</sup>	<input type="text" value="3"/>	$0 \leq x \leq 5$
How will you pay for the new machines? <sup>?</sup>	Deferred payment <span style="float: right;">v</span>	
How many workers will you hire (to operate machines)? (number of workers) <sup>?</sup>	<input type="text" value="6"/>	$0 \leq x \leq 12$
How many workers will you lay off? <sup>?</sup>	No layoff <span style="float: right;">v</span>	
How much will you spend on training? (Euro) <sup>?</sup>	<input type="text" value="2000"/>	$0 \leq x \leq 50000$
How much will you spend on technology to improve efficiency? (Euro) <sup>?</sup>	<input type="text" value="20000"/>	$0 \leq x \leq 50000$
How much will you spend on technology to improve effectiveness? (Euro) <sup>?</sup>	<input type="text" value="20000"/>	$0 \leq x \leq 50000$

[Save](#)

Figure 15 - Decisions





## 6. Verify your decisions.

Decisions for month 4 (Thomas Game - game open)

25%

[HELP](#)

[Game](#)   [Current situation](#)   [General View](#)   [Parameters](#)

-  Supply Management
-  Production Management
-  Marketing and sales management
- Summary
-  Download Decision History

[Confirm decisions - End round](#)

### Supply Management

How much raw material will you order from the local supplier? (Kg) <sup>?</sup>	<input type="text" value="1100"/>	$0 \leq x \leq 1200$
How much will you pay for the raw material from the local supplier? (Euro/Kg) <sup>?</sup>	<input type="text" value="10,00"/>	$0,00 \leq x \leq 20,00$
Order of packaging (number of packaging) <sup>?</sup>	<input type="text" value="10"/>	$0 \leq x \leq 20000$

### Production Management

How much raw material will you process? (kg) <sup>?</sup>	<input type="text" value="5"/>	$x \geq 0$
Purchase of new machines (number of machines) <sup>?</sup>	<input type="text" value="3"/>	$0 \leq x \leq 5$
How will you pay for the new machines? <sup>?</sup>	Deferred payment <span style="float: right;">v</span>	

Figure 16 - Verification



## 05. Model

### 3.1.2 The companies' activities (Decision Making)

Now you have access to the companies' activities that are organized in **three general areas:**

**The management of supply, and therefore the relationship with the two suppliers, local and foreign. Conditions relating to the management of supply:**

- The company produces a single type of finished product, starting from a single type of raw material.
- You get the raw material by ordering it from two suppliers: a local supplier and a foreign supplier.
- The local supplier accepts orders each month and delivers the goods the following month. The quantity of raw material actually obtained depends on the sum of the orders of all companies: if you have not exhausted the availability of the supplier, you get the order; otherwise the amount obtained is reduced according to the price offered: whoever offers a higher price obtains a minor reduction.
- The foreign supplier accepts orders only in certain months of the year and delivers the goods with a delay of several months. The raw material is ordered with a fixed price and is transported in containers, each of which has a fixed cost of rent and a maximum capacity. Each order includes a maximum quantity of deliverable raw material.
- Regardless of its origin, the raw material received is kept in one raw material warehouse. • The raw material warehouse contains a certain amount of raw material, as a result of operations inherited the previous year.
- Since the finished products must be sold packaged, you must also buy packaging of a single type, that is kept in a packaging warehouse. The unit cost of packaging is determined by the sole



## 05. Model

supplier, and it depends on whether they are purchased at retail or wholesale, in the specific number less than or greater than a given threshold.

**The production management, includes the warehouse management, the production capacity (equipment and personnel) and the technology development. Conditions relating to the management of the production:**

- The process of transformation of raw materials into finished products is achieved by machines and workers in warehouses, in which you pay for the rent and the use of energy. New equipment may be acquired, even with deferred payment. Workers can be hired and/or fired: their labor productivity can be improved by investing in their technical training.
- Investments in technology and training determine the quality of the process of transformation of the raw material. The production of finished products, broken down into high-quality products and products of average quality (maintained separately in the finished goods warehouse), depends on those investments.
- The investments allow for improvements in the efficiency and effectiveness of the process. Improving the efficiency increases the number of finished products made per unit of raw material and decreases the cost of implementation of each product. Improving the effectiveness increases the fraction of high-quality products on the total of the finished products made.
- At the beginning of the game, the management inherited from the previous year is such that the company is able to produce only finished products of medium quality. The finished products in stock are of medium quality as a result of previous management.

**The management of marketing and sales, through the two channels, stores and hypermarkets, according to the general scheme. Conditions relating to the management of marketing and sales:**



## 05. Model

- The finished products are put on sale, with their packaging, through two channels: stores, which accept only high quality products, and hypermarkets, which accept both products of high quality and of average quality.
- The stores have a capacity of less than the total sales of the hypermarkets, but accept higher selling prices. The sale price in hypermarkets is the same for products of high quality and medium quality.
- The number of finished products sold in stores and hypermarkets depends on various factors, including the asking price and the investments made in advertising.

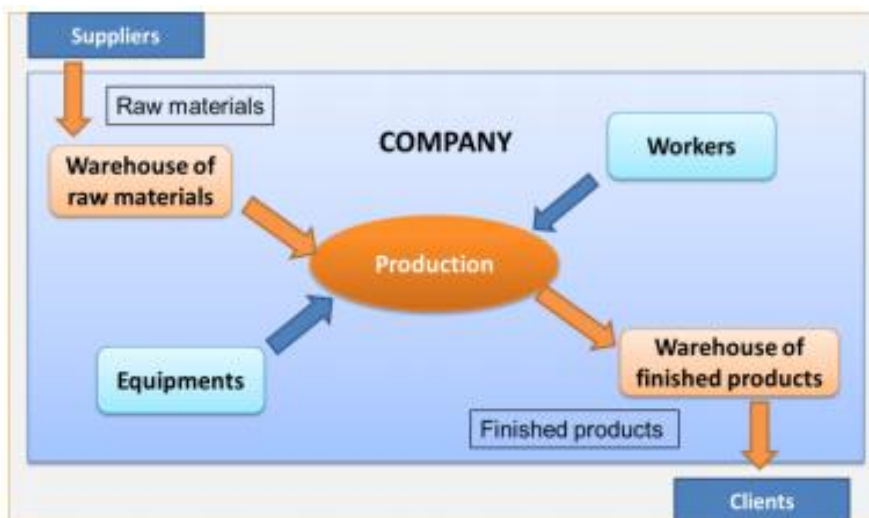


Figure 17 - The Company's Activities

### 3.1.3 The market analysis

The market analysis tab shows the following three areas:

## 05. Model

- Current situation: Overview about the current situation of the company with values for Supply, Production, Marketing and Sales management as well as the overall results of the management and the market research data.

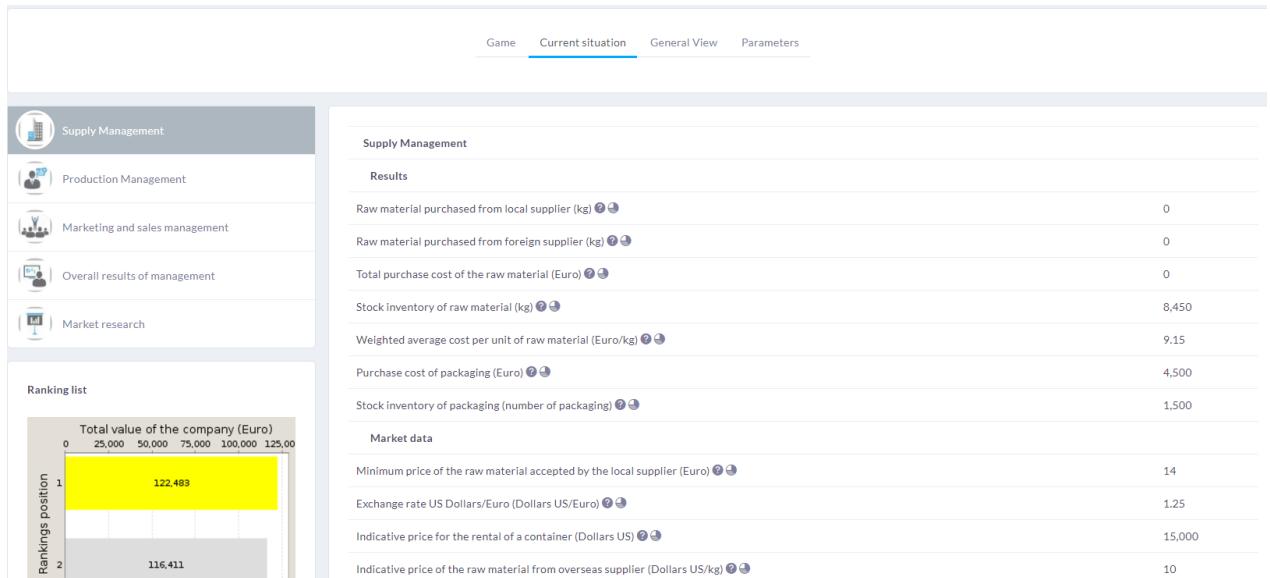


Figure 18 - Current situation

- General view: Decision history from all the rounds already played in the current session

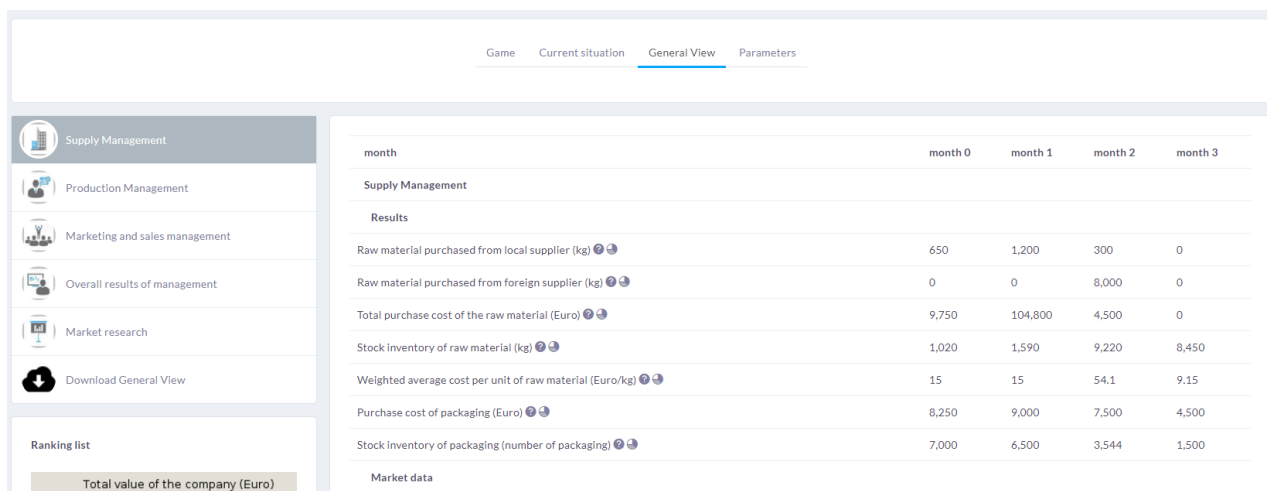


Figure 19 - General view

- Parameters: Overview and description of the game parameters

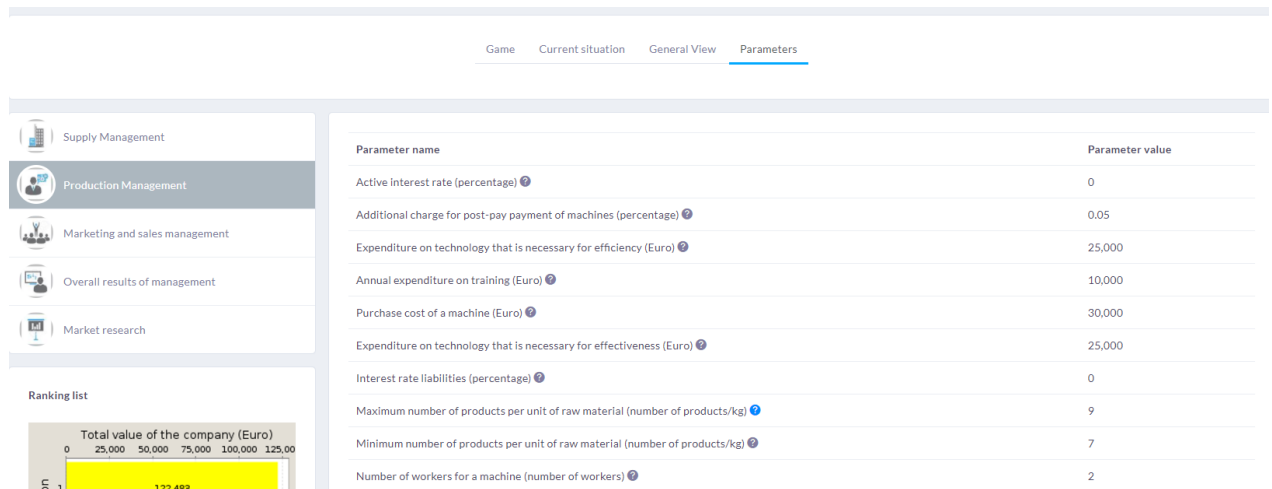


Figure 20 - Parameters

### 3.1.4 Experiences with the game

There are different ways to become familiar with the game. Since there is not a single one “right approach”, this chapter will outline experiences from the project partners:

DCU (Ireland): *Watch tutorials and practice a few times first - those who received top scores in Ireland had played it a few times and had a strategy to begin with. The participants felt that they needed to practice first to really understand the layout of the game, the information and what was expected of them.*

BIA (Bulgaria): *It occurred very useful for the participants during the game to explain to them in detail what information they receive after each round in the “current situation” of the separate sections (supply management, production management, etc.)*

LIUC (Italy): *Practicing sometimes the game is the best training for the players. In the Italian experience we noticed that the players that have had some previous experience of the game had a better performance.*

NKUA (Greece): *Participants who have tried the game before, find it easier to play it and to take decisions. Some users found very useful the additional information that is included in the help button. Also some participants used the glossary in order to understand the concept of the game.*



## 05. Model

### 3.2 Toolkit

To support participants, project target groups and stakeholders of the project it is essential to offer **supporting materials** that provide clear instructions on how to use the tools offered on the platform. These materials will make the P4G BG easier to play and more enjoyable, and can be used for educational, training, evaluation and guidance purposes.

The following supporting materials are available and have (in parts) be translated into English [EN], Italian [IT], Greek [GR], Bulgarian [BG], Turkish [TR]:

Tool / Language	Content
Technical Guides for Trainers (ppt, pdf) <a href="#">EN</a>	The following topics are included in the technical guide for trainers: <ul style="list-style-type: none"> <li>● P4G Business Game Objectives</li> <li>● Why is the P4G Business Game Innovative</li> <li>● Tips and available resources to support trainer</li> <li>● Competences to be developed by learners engagement</li> <li>● Game parameters</li> <li>● Exemplary Scenarios</li> </ul>
Technical Guides for Players (ppt, pdf) <a href="#">EN</a> , <a href="#">IT</a> , <a href="#">GR</a> , <a href="#">BG</a>	The following topics are included in the technical guide for players: <ul style="list-style-type: none"> <li>● The Game in Summary</li> <li>● General characteristics of the markets</li> <li>● Business activities</li> </ul>







## 05. Model

	<ul style="list-style-type: none"> <li>• Introduction to the use of the software system</li> <li>• Target Variable</li> <li>• Supply, Production, marketing and sales management</li> <li>• Results of the management</li> </ul>
<p>Detailed players guide (pdf)</p> <p><a href="#">EN</a>, <a href="#">BG</a></p>	<p>More detailed version of the "Technical Guide for Players"</p>
<p>Glossary (Syllabus) (pdf)</p> <p><a href="#">EN</a>, <a href="#">IT</a>, <a href="#">GR</a>, <a href="#">BG</a>, <a href="#">TR</a></p>	<p>List of essential words to the project activities with clear references to the European approaches and terminologies.</p>
<p>P4G How To Play Video</p> <p><a href="#">EN</a></p>	<p>Introduction on how to play (Interactive version of the Quick start game guide)</p>





## 05. Model



<p>Quick start game video guide  <a href="#">EN</a>, <a href="#">IT</a>, <a href="#">GR</a>, <a href="#">BG</a>, <a href="#">TR</a></p>	<p>This is a quick guide to the game: What is the online business, and what players must do to compete in the virtual market.</p>
<p>Quick start game guide (pdf)  <a href="#">EN</a>, <a href="#">IT</a>, <a href="#">GR</a>, <a href="#">BG</a>, <a href="#">TR</a></p>	<p>Written version of the Quick start game video guide.</p>

**Play4Guidance Business Game – A quick start guide**  
Author: Università Carlo Cattaneo (LIUC)

HOW TO PLAY	THE SIMULATED MARKET
<p>With this game you can demonstrate your <b>skills of business management!</b> The game is divided into <b>periods</b> in which you have to save your own <b>decisions</b>. Once saved, you can see the <b>results</b> and proceed to the next round.</p> <p>Each of the periods of the game represents <b>a month</b> of management of your virtual company. You and your opponents will have to compete in the market of t-shirts, managing companies which are operating in that market and are in the same initial conditions as yours.</p> <p><b>Please note that</b></p> <ul style="list-style-type: none"> <li>• the market is only made up of your company and those of your opponents,</li> <li>• companies are in indirect competition for the acquisition of scarce resources upstream (in the process of acquisition of raw materials from suppliers), and downstream (trying to sell products to customers).</li> </ul> <p>Through the "Decisions" button, you can access the control panel to manage your company. For each area (supply, production, sales), you can define the plan for the following months by placing the most significant values.</p> <p>Follow these <b>simple steps to play</b>:</p> <ol style="list-style-type: none"> <li>1. Analyze the current situation of your company by clicking the "Last turn results"; for each variable in the list you can click the "?" to know details, or the image of the chart to look at trends.</li> <li>2. Enter your decisions, via the Decisions button you will be taken to a page with the full set of decisions. If you click on the buttons of each area of business management (supply, production, sales) you will find all the information and decisions divided by area.</li> <li>3. When you have finished all decisions click on the "End round" in the main Decisions panel. You will see the results for the period just ended and you can access a new round of the game.</li> </ol> <p><b>N.B. At any time you can see your position in the ranking, by clicking on the graph image of the variable "The Value of The Company."</b></p>	<p>Your company produces two types of product (<b>high-quality t-shirts</b> and <b>average quality t-shirts</b>), by processing a single type of raw material. You get the raw material by ordering it from two suppliers: a local supplier and a foreign supplier.</p> <p>The process of transformation of raw materials into products is achieved by <b>machines</b> and <b>workers</b> in warehouses, for whom you pay the rent and the use of energy. New equipment may be purchased, even with deferred payment. Workers can be hired and/or fired: their labor productivity can be improved by investing in their technical training. <b>Investments</b> in technology and training determine the quality of the process of transformation of the raw material. The production of high-quality t-shirts and average quality t-shirts depends on those investments.</p> <p>The products are put on sale, with their packaging, through two channels: <b>stores</b>, which accept only high quality t-shirts, and <b>hypermarkets</b>, which accept both high quality and average quality t-shirts. The stores have a capacity of less than the total sales of the hypermarkets, but accept higher selling prices.</p>

<p>Assessment guide / Skill matrix</p>	<p>Description of different targets in the different countries involved.</p>
--	--





## 05. Model

<p>(ppt, pdf)  <a href="#">EN</a>, <a href="#">BG</a>, <a href="#">TR</a></p>	
	<div style="background-color: #1a3d54; color: white; padding: 20px; text-align: center;"> <p><b>THE PLAY4GUIDANCE BUSINESS GAME</b></p> <p><b>ASSESSMENT (THE MATRIX)</b></p> </div>
<p>Tutorial for trainers          (ppt, pdf)  <a href="#">EN</a></p>	<p>Key resource related to the “Technical Guide for Trainers” that supports, informs and prepares teachers &amp; trainers. Useful learning scenarios for trainers are provided.</p>
	<div style="background-color: #1a3d54; color: white; padding: 10px;"> <p><small>P4G Trainer'sGuide</small></p> <p><b>TIPS AND AVAILABLE RESOURCES TO SUPPORT TRAINERS</b></p> <ul style="list-style-type: none"> <li>✓ Learners: <b>issues or problems</b> - <b>encourage</b> them to try to figure out the solution</li> <li>✓ explain the <b>aims &amp; benefits</b></li> <li>✓ Guide learners through the P4G “<b>Great Denominator Matrix</b>” section at <a href="http://www.play4guidance.eu" style="color: white;">www.play4guidance.eu</a></li> <li>✓ Encourage learners to make use of the “<b>Glossary</b>”</li> <li>✓ Provide <b>guidance</b> and <b>feedback</b> before and after learners enter final decisions</li> <li>✓ Access <b>intermediary results</b></li> <li>✓ Tasks within a <b>team environment</b></li> </ul> </div>
<p>Video tutorial for Players:  <a href="#">EN</a>, <a href="#">IT</a>, <a href="#">GR</a>, <a href="#">BG</a></p>	<p>Key resource related to the “Detailed players guide” to inform, prepare &amp; support players.</p>



	
<p>Introductory Video for the P4G BG</p> <p><a href="#">EN, TR</a></p>	<p>More General P4G Introduction video for first time visitors / players.</p>
	

Table 5 - Tool overview

### 3.3 Assessment

The competences introduced in chapter 2.2.3.2 are **automatically assessed** during the game. **For each competence, different actions are needed** to play in a successful way and to reach a high score. Some of the competences can be seen as a result of other competences and are therefore **related to each other**:

Category of competences and their relationship	
Competence	Related competences



## 05. Model

Analytical Thinking	Information seeking
	Order and Quality
Expertise	Order and Quality
	Result Orientation
Flexibility	Innovation
Decision Making	Result Orientation
	Analytical Thinking
	Flexibility

Table 6 - Related competences

In addition to the users' decisions, some **specific questions** are asked to reach a better understanding of why the player takes some actions and if the action is related to a specific strategy or if it is only a casual move.

### 3.3.1 Calculation of the user's score

In all assessments, we use the results from different game variables that, for better balancing, are always normalized in the form of [0:1]

After normalization, a general rule is that given "X" the score of a given competence, the evaluation will be:

**LOW:  $X < 0.25$**

**MEDIUM:  $0.25 < X < 0.60$**

**HIGH:  $X \geq 0.60$**

The reason for the explained assessment balance follows general game development rules in which an oversensitivity in obtaining a non-medium score will influence the player in trying to maximize the assessment by reverse engineering the more sensitive variables.





## 05. Model

The “dependence” of a competence in the assessment of another, that can be found in some of the below calculations, it is to be understood as the full assessment value [0:1] added to the equation of values that will be then normalized in a new [0:1] value range for the assessment of the “depending” competence.

E.g. Flexibility = Mix of suppliers’ index\*0.5 + Innovation assessment\*0.5

Given Mix of suppliers’ index = 0.1,

Innovation assessment = 0.9 [Innovation assessed as HIGH]

Flexibility =  $0.1*0.5 + 0.9*0.5 = 0.5$  [MEDIUM]

### 3.3.1.1 Information Seeking

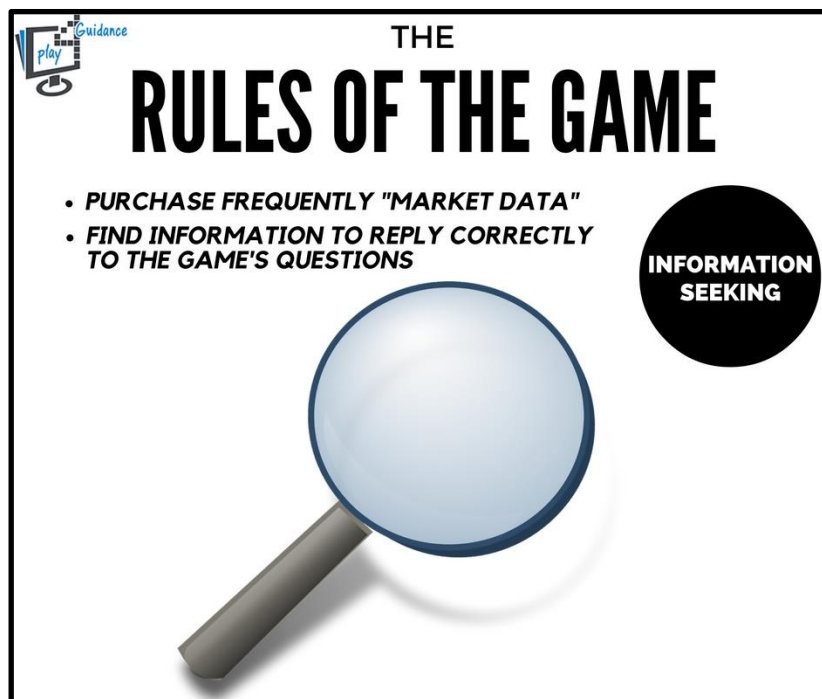


Figure 21 - Information Seeking

*The ability to find and capture information to increase knowledge or find solutions*



## 05. Model

It is calculated by monitoring the purchase frequency of Market Data during the game and the 9 related assessment questions.

Weight is divided equally between game behaviour and assessment questions.

As for balancing, being "perfect" in just one of the 2 factors OR average in both will score up to a medium valuation.

### Questions:

- In the process of raw material acquisition, how many type of suppliers are available?

One; **Two**; More; I don't know.

- How many workers are needed for the operation of a single machine?

**Two**, Three; Five.; I don't know. (Information seeking)

- What is the effect of technology investments?

Improving digital competences of the workers; **Increasing production of the high quality products**; optimizing the value of the company; I don't know.

- How many "warehouses" are there?

Two, **Three**, Six; I don't know.

- What is the effect of training expenditures?

Increasing both the effectiveness and the efficiency of production; **Increasing the efficiency of production**; Increasing overall selling; I don't know.

- When is available (on the warehouse) the raw material ordered by foreign supplier?

One month after the order; **Two months after the order**; Three months after the order; I don't know.

- Is it possible to sell high quality products to hypermarkets? **Yes**, No, I don't know.
- How many times have you used the "?" button to better understand the meaning of game's variables? Never; **2**; 10; More than 10. (Information seeking)
- During the game how many times have you looked at the Player's Manual or the FAQs? Never; **2**; 10; More than 10



### 3.3.1.2 Business Acumen

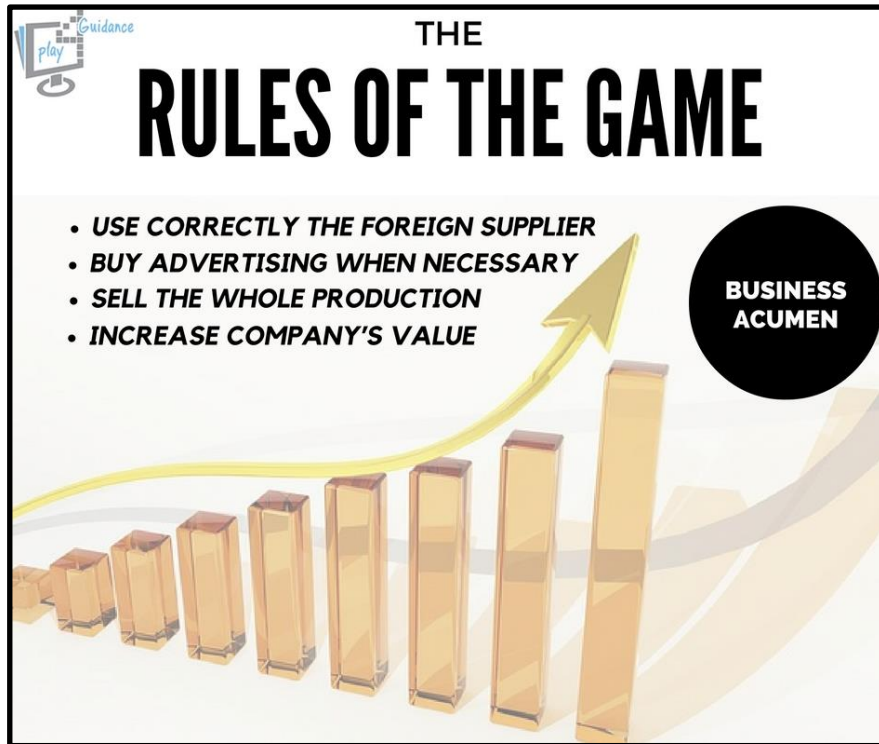


Figure 22 - Business Acumen

*The ability to discover opportunities and transform resources into performance*

It is calculated monitoring:

- Suppliers usage [20%] (*Do players use correctly the foreign supplier?*)
- Advertising usage [20%] (*Do players buy advertising when necessary?*)
- Sales Management[20%] (*Do players sell the whole production?*)
- *Result Orientation* dependence [20%] (*Do players increase company's value?*)
- Assessment questions [20%]

#### Question





## 05. Model

- Why did you use the local supplier? Because is cheaper; **because his delivery is the quickest**; because you can pay 4 months after the delivery.
- Why did you use the foreign supplier? **Because is cheaper**; because you can buy whenever you want; because you can pay cash

### 3.3.1.3 Decision Making

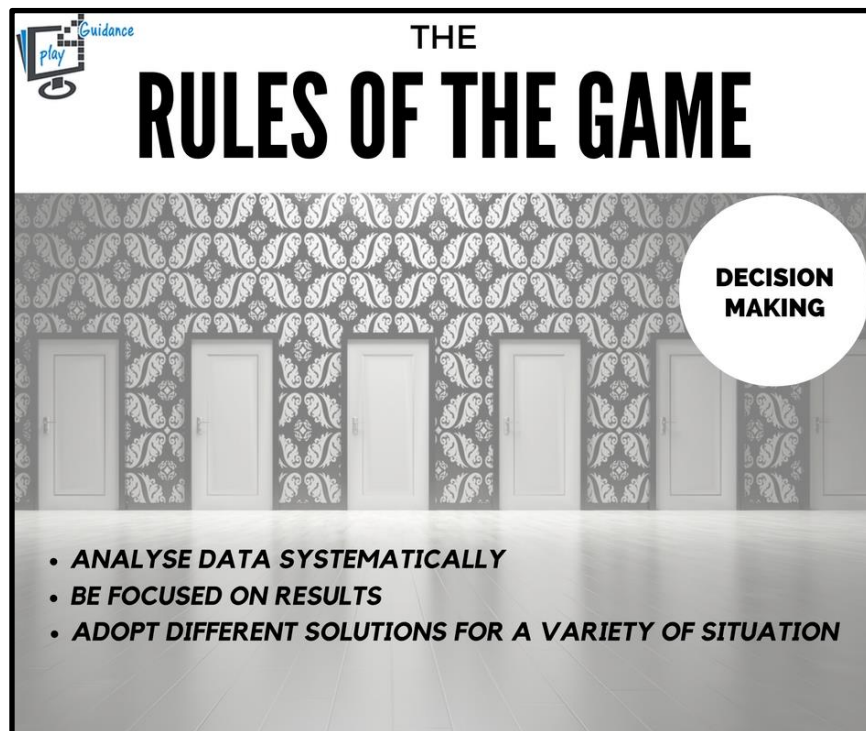


Figure 23 - Decision Making

*The ability to create new problem solutions also in highly complex situations and in large teams / organizations*

It is calculated monitoring:

- *Result Orientation* dependence [33.3%]
- *Analytical Thinking* dependence [33.3%]
- *Flexibility* dependence [33.3%]



### 3.3.1.4 Commitment to learning

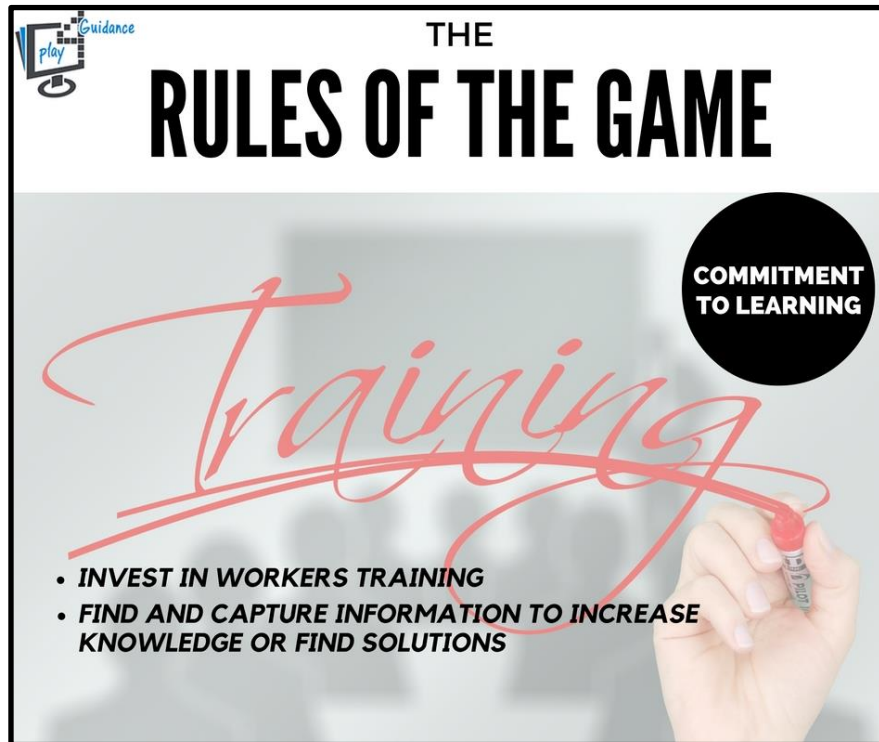


Figure 24 - Commitment to learning

*The ability to actively pursue learning and develop competitiveness*

It is calculated monitoring:

- Commitment in workers training versus needed training expenditure [33.3%]
- *Information Seeking* dependence [33.3%]
- Assessment questions [33.3%]

#### Questions

- Why did you use the foreign supplier?

**Because it is cheaper;** because you can buy whenever you want; because you can pay cash



## 05. Model

- Before making decisions have you searched any keywords on Google (or other) related to the game?

Yes; No

### 3.3.1.5 Analytical Thinking

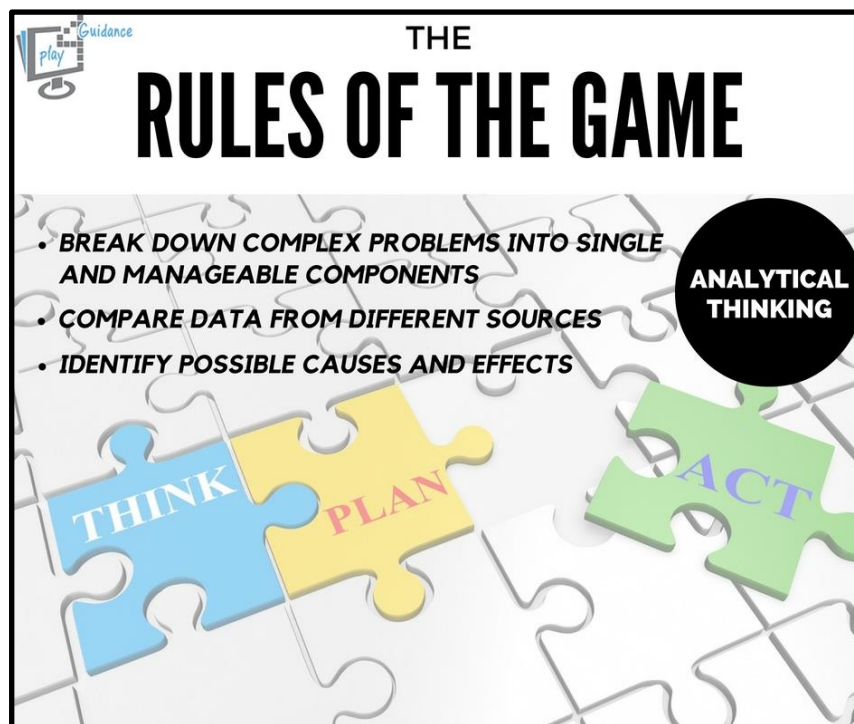


Figure 25 - Analytical Thinking

*The ability to analyze problems systematically.*

It is calculated monitoring:

- *Order and Quality* dependence [50%]
- *Information Seeking* dependence [50%]

### 3.3.1.6 Order and Quality



Figure 26 - Order and quality

*The ability to reduce uncertainty and to control quality.*

It is calculated monitoring:

- Correct usage of production capacity [25%] (*Do players use the entire production capacity to maximize the number of final products?*)
- Number of stock-outs [25%] (*Do the supply meet the demand?*)
- Correct leveraging of Stocks [25%] (*Do players use a lean production to minimize stocks?*)
- Correct leveraging of production efficiency [25%] (*Do players increase the available production capacity?*)

### 3.3.1.7 Expertise

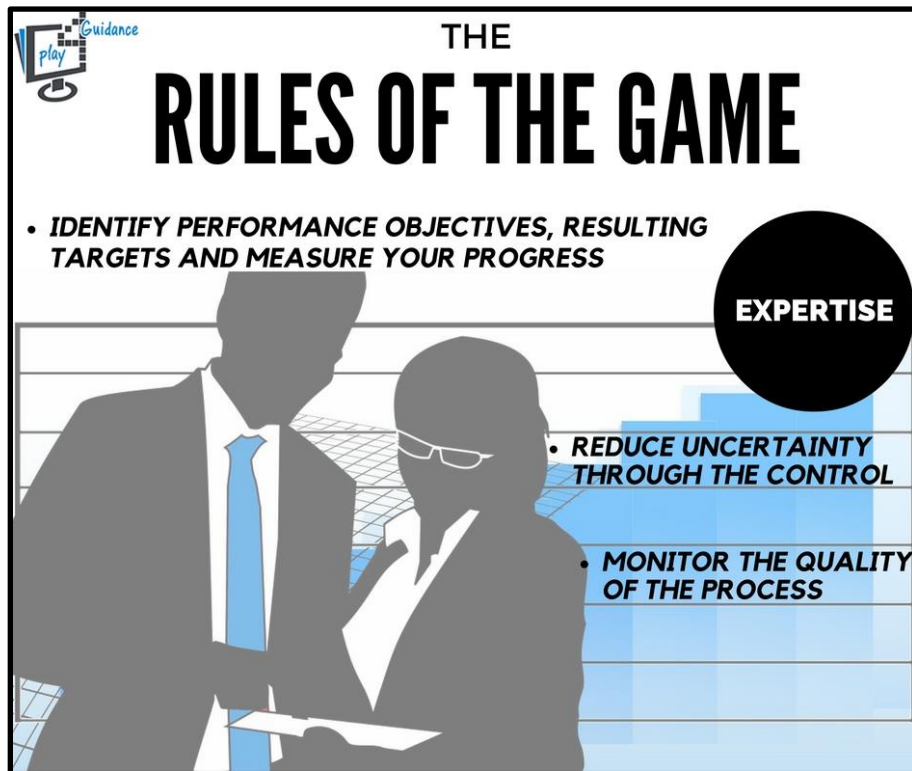


Figure 27 - Expertise

*The ability to perform professional jobs.*

It is calculated monitoring:

- *Order and Quality* dependence [50%]
- *Result Orientation* dependence [50%]



## 05. Model

### 3.3.1.8 Flexibility



Figure 28 - Flexibility

*The ability to effectively adapt to a variety of situations.*

It is calculated monitoring:

- Mix of suppliers chosen [50%] (*Do players use correctly the foreign supplier?*)
- *Innovation* dependence [50%]

### 3.3.1.9 Result Orientation



Figure 29 - Result orientation

*The ability to set performance objectives, resulting targets and measures.*

It is calculated monitoring:

- Growth of company value [25%] *(Do players increase company's value?)*
- Player's company value versus System's company value [25%]
- Strategy [50%]

*(If the player hire new workers, does he invest the correct budget in training? Do players invest constantly?)*



## 05. Model

### 3.3.1.10 Innovation

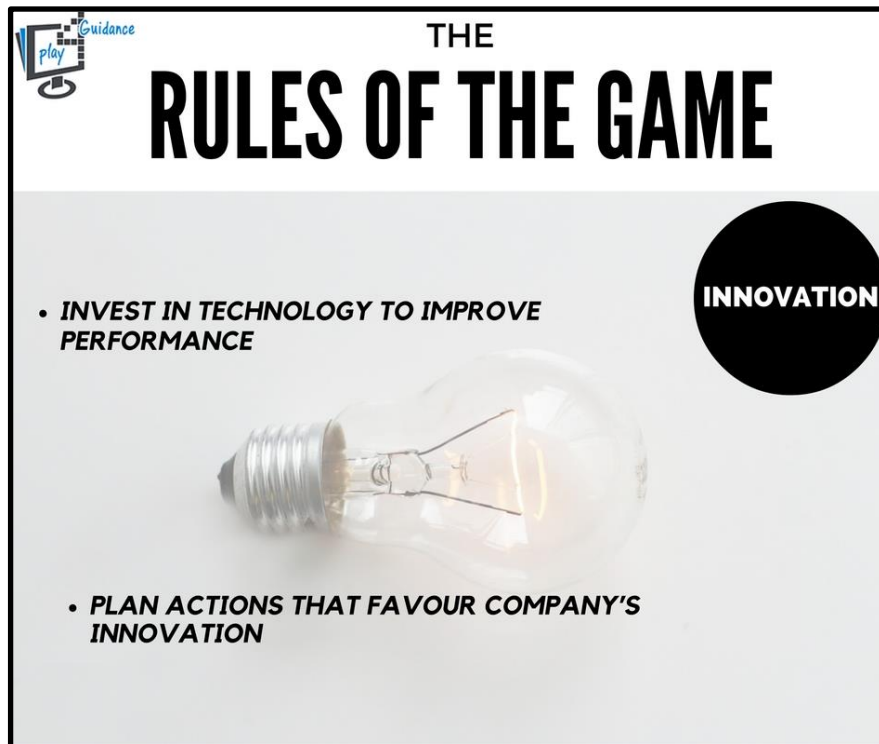


Figure 30 - Innovation

*The ability to make something new and to improve performance.*

It is calculated monitoring:

- New technology expenditure [50%]

Player's actions that favour company's innovation [50%]

### 3.3.2 Experiences with the automatic assessment tool

Due to the personal experience of the project partners and the results of the second pilot phase it was suggested that feedback should be given earlier in the game to support the players and help them to understand the impact of their decisions and how to improve.

While the players in the current version of the game must still have played the complete 12 rounds to receive feedback, it seems useful in the case of a further development of the game to







## 05. Model

give the users direct feedback on their decisions. According to the feedback, the current version of the game might not meet the user's needs.

### 3.4 Reflection / Lessons learned

Aiming to support a European culture on entrepreneurship and to assist young people to become entrepreneurs, the P4G project has made a significant contribution to the achievement of this goal. With the Greatest Common Denominator Matrix (GCDM), a main result of the assessment, a milestone toward the definition of the characteristics of a 'Young European Entrepreneur' could be reached. The found competences could be confirmed in the pilot phases and thus have great relevance for approaching entrepreneurs. By means of the pedagogical approach, these and other competences could be embedded in the business game and put into a learning context.

Important in the context of P4G was not only to focus on the business game, but also to develop holistic learning scenarios.

In the design of the learning scenarios, the demarcation of the target group and the context was decisive. With the help of the skills matrix as well as the pedagogical approach, the competencies and the manner of mediation were determined. In the last part of the preparatory phase, the focus was on the learning activities, the role description as well as tools and services that can be integrated into the scenario. In addition, an example scenario was listed.

In the second phase, the Play & Perform phase, the game was first presented with the most important components, the activities of the company as well as the market analysis. The toolkit supports the learning process with different resources. At the end of the chapter, the evaluation and feedback system was explained in detail.

The scenarios will help trainers and teachers to adapt to the business game and the additional learning materials for different contexts and target groups. While the overall implementation of the learning scenarios was very successful, there were still suggestions for improvement to carry out the game:

DCU (Ireland): *Many participants struggled in terms of understanding the impact of their decisions and suggested that they would have benefitted from more feedback from the game itself. The majority of participants felt that more visually appealing graphics would have made it a more user friendly experience. Participants really enjoyed the multiplayer version of the game, as being able to see your position on the leader board added to the competitive element and*





## 05. Model

*added a great deal of fun and motivation. Providing opportunities for reflection and discussion during the different rounds was also beneficial to participants as they could consolidate their learning and experiences.*

*BIA (Bulgaria): The Multiplayer version of the game was more appealing to the participants in Bulgaria because of the competitive environment which it simulated and the knowledge gained as a result of the internal discussion in each team.*

*LIUC (Italy): Some participants ask for more variables in the game (to let grow the complexity of the game during the rounds); we think that this request means that after many played games the players wish have something different and the game should change and/or increase the difficulty after a certain number of games. With these improvement the game could remain interesting and challenging for long time.*

*NKUA (Greece): The multiplayer game was more demanding as the players had to antagonize other people. All participants enjoyed the multiplayer version of the game. The function of the virtual market was closer to the real one and as a result the players were involved in logical reasoning.*

All in all, it can be said that P4G could successfully implement the original goal of providing an innovative learning experience for students and young unemployed in the area of entrepreneurial competences. Improvement potential is seen by the users mainly in some game details, especially in usability aspects and the adaptation of the difficulty level.



## 05. Model

### 4. List of Table & Figures

#### *List of Figures*

Figure 1 - Structure .....	6
Figure 2 - Introduction video on Entrepreneurship .....	10
Figure 3 - Play the Game Icon .....	11
Figure 4 - Quick guide video .....	12
Figure 5 - Videos on the 10 competences (4 shown).....	14
Figure 6 – Current situation tab .....	15
Figure 7 - General view tab .....	16
Figure 8 - Market situation tab.....	16
Figure 9 - Extract of the Cross-border business development scenario.....	38
Figure 10 - Extract of the "Take decisions" scenario.....	38
Figure 11 - Start Page.....	39
Figure 12 - Registration Form .....	40
Figure 13 - New Game .....	40
Figure 14 - Game overview.....	41
Figure 15 - Decisions .....	42
Figure 16 - Verification.....	42
Figure 17 - The Company's Activities .....	45
Figure 18 - Current situation.....	46
Figure 19 - General view .....	46
Figure 20 - Parameters.....	47
Figure 21 - Information Seeking.....	54
Figure 22 - Business Acumen.....	56





## 05. Model

Figure 23 - Decision Making.....	57
Figure 24 - Commitment to learning.....	58
Figure 25 - Analytical Thinking.....	59
Figure 26 - Order and quality.....	60
Figure 27 - Expertise.....	61
Figure 28 - Flexibility.....	62
Figure 29 - Result orientation .....	63
Figure 30 - Innovation .....	64

### *List of Tables*

Table 1 - Learning scenario context.....	20
Table 2 - 10 Most Important competences.....	32
Table 3 - Evaluation Results .....	34
Table 4 - educational Scenario Example.....	37
Table 5 - Tool overview.....	52
Table 6 - Related competences .....	53

### *List of linked resources*

Chapter	Resource	Link
2.1.2.1	Introduction video on entrepreneurship	<a href="#">Introduction</a>
2.1.2.3	How to Play Video	<a href="#">How To Play</a>
2.1.2.4	10 Competences Videos	<a href="#">10 Competences</a>
2.1.2.5	Link to game overview	<a href="#">Link to the Game</a>
2.2.3.2	Assessment Final Report	<a href="#">Assessment Final Report</a>
2.2.4	Pedagogical Approach	<a href="#">Pedagogical Framework</a>
2.2.6	Pilot Summary	<a href="#">Pilot Summary</a>
2.2.8	Cross-border business development scenario	<a href="#">Cross-border business development</a>





## 05. Model

2.2.8	'Take decision' scenario	<a href="#">Take decisions: Learn how to run a company</a>
3.1.1.	P4G Game Link	<a href="http://play4guidance.cetic.liuc.it/">http://play4guidance.cetic.liuc.it/</a>
3.2	Technical Guide for Trainers (ppt, pdf)	<a href="#">EN</a>
3.2	Technical Guide for Players (ppt, pdf)	<a href="#">EN, IT, GR, BG</a>
3.2	Detailed players guide(pdf)	<a href="#">EN, BG</a>
3.2	Glossary (Syllabus) (pdf)	<a href="#">EN, IT, GR, BG, TR</a>
3.2	How to Play Video	<a href="#">EN</a>
3.2	Quick start game video guide	<a href="#">EN, IT, GR, BG, TR</a>
3.2	Quick start game guide (ppt,pdf)	<a href="#">EN, IT, GR, BG, TR</a>
3.2	Assessment guide / Skill matrix (ppt,pdf)	<a href="#">EN, BG, TR</a>
3.2	Video tutorial for trainers	<a href="#">EN</a>
3.2	Video tutorial for Players:	<a href="#">EN, IT, GR, BG</a>
3.2	Introductory Video for the P4G BG	<a href="#">EN, TR</a>

## 5. References

- European Commission. (2014). The Entrepreneurship 2020 Action Plan. Retrieved from <http://ec.europa.eu/DocsRoom/documents/10378/attachments/1/translations>
- Suchman, L. A., & A., L. (1987). *Plans and situated actions: the problem of human-machine communication*. Cambridge University Press. Retrieved from <http://dl.acm.org/citation.cfm?id=38407>
- Wheeler, M., & Clark, A. (2008). Culture, embodiment and genes: unravelling the triple helix. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 363(1509). Retrieved from <http://rstb.royalsocietypublishing.org/content/363/1509/3563>
- Wu, W.-W. (2009). A competency-based model for the success of an entrepreneurial start-up. Retrieved from <http://www.wseas.us/e-library/transactions/economics/2009/32-323.pdf>

