## Evaluation Plan and Framework

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<th>Work package Title</th>
<th>Proof of Concept and Evaluation</th>
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<td>Task Title</td>
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<td>Reviewers</td>
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<td>Peter Hanečák (EEA-SRO), Gian-Luca Gasparini (SEFEA); Aurora Prospero (FEBEA)</td>
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## Revision History

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List of Abbreviations

ICT  INFORMATION AND COMMUNICATION TECHNOLOGIES
IT   INFORMATION TECHNOLOGY
TAM  TECHNOLOGY ACCEPTANCE MODEL
TRA  THEORY OF REASONED ACTION
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Executive Summary

This deliverable presents the strategy designed in order to evaluate the PROFIT platform in three testing cycles that will take place in 2017 and 2018. Their focus will be primarily on the general satisfaction of the users with the platform, that is, ease of use and usefulness. Moreover, a general overview of the evaluation for each module of the platform will be presented.

The strategy was elaborated based on the previous activities of the project, especially concerning the definition of the 12 User Groups and the 5 Use cases and Scenarios defined in Work Package 1 (WP1). Another source for the content of this deliverable was the pertinent literature concerning the evaluation of ICT tools and in particular the assessment of the ease of use and usefulness of the platform.

This deliverable also contains an early overview of Social Innovation Assessment, which will be further developed in the subsequent deliverables of WP6. This framework will evaluate the social and economic impact of the platform on the target groups represented by the testers.

The content of this deliverable is the bedrock upon which the remaining activities of WP6 will be built, especially the evaluation questionnaire. The questionnaire will be improved as the work on WP6 progresses and the testers will provide us with valuable feedback.
1. Introduction

The PROFIT Platform is conceived as a solution catering to the exact need of action enhancement for greater financial awareness and capability that has been identified as a major target for improved social performance, client protection and, ultimately, greater societal well-being. More specifically, PROFIT is a user-centred financial awareness platform that will obtain finance-related crowdsourced data from the Web and its users and create new knowledge and advanced forecasting tools to help them understand financial data and trends and empower them in decision-making and financial capability, catering to their specific profile. Such a multi-functional solution for the user has not been available in the European environment so far.

Thanks to PROFIT, European citizens will be able to (i) report financial news or related information; (ii) express their opinion by commenting contributions made by other users; (iii) connect and interact with other citizens inside and outside their communities; (iv) get informed on financial news, as well as financial and market trends, forecasted by techniques that exploit the market sentiment; (v) assess their financial literacy level; and (vi) get assistance in order to better understand all available financial information. As an innovative financial awareness platform, the project will lead to new collective financial knowledge, forecast market trends extracting the market sentiment from users’ opinions throughout the EU, and improve the financial literacy of EU citizens.

The task of designing the PROFIT Financial Intelligence Platform crosses the boundaries of many different disciplines like economics, finance, business, social sciences, and information and communication technologies (ICT). Given (the fact) that the PROFIT platform is highly innovative and based on experimental procedures, it is essential to test it throughout its implementation. Therefore, it is important to evaluate not only the general satisfaction of the users with the platform, but also the main functionalities that are (currently) being developed in several Work Packages (WPs). Namely, they are:

- Incentive mechanisms (WP1 – Requirements and Functional Design);
- Visualisation tools, crowdsourcing, recommender engine (WP2 – Linked Data Cycle);
- Financial literacy (WP3 – Financial Literacy for Informed Decision-Making);
- Market sentiment and financial forecasting (WP4 – Market Sentiment-Based Financial Forecasting).

Such features will be thoroughly assessed in the related deliverables, whereas WP6 and WP5 will be more focussed on the perceived satisfaction of the testers, as well as the overall usefulness and ease of access of the PROFIT platform.

1.1 Scope of the document

This deliverable represents the first step in the activities concerning WP6 – Proof of Concept and Evaluation. In this WP, the initial set of PROFIT services and applications will be introduced to the customers of FEBEA member organizations. Then, an evaluation of the service acceptability,

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1 Founded in Brussels in 2001, FEBEA is the European Federation of Ethical and Alternative Banks and Financiers. It brings together financial institutions from 14 European countries with the aim of developing ethical and social finance in Europe.
effectiveness and cost-benefits will be carried out, in order to validate these aspects of the project deployment plan. More specifically, this Work Package aims to:

- Test and evaluate the predefined set of services;
- Identify requirements for modification on the basis of the evaluation results;
- Demonstrate the feasibility and the viability of the PROFIT concept;
- define social innovation indicators and/or scoreboards;
- provide some preliminary indications on the social impact of the platform.

This document provides the main reference for the activities related to Task 6.1 – Pilot Plans and Realisation, which will accomplish two main objectives:

1. Define clearly the sample of targeted users to be involved in the testing and evaluation activities;
2. Give a detailed shape to the data collection framework and execution of the pilots.

Therefore, this deliverable will describe the evaluation framework that will be implemented in order to assess the prototypes of the platform and provide some early feedback to the platform developers and also to stakeholders regarding the social impact of the platform. Such framework will include: (a) an overview of the evaluation strategy, (b) the methodology chosen for the selection of the sample of testers, and (c) the assessment criteria and mechanisms for the PROFIT service trials. Particular attention will be paid to the definition of the testers that will participate in the assessment, along with the assessment tools (peer reviews, on-line questionnaires, feedback from users, usage statistics, etc.) that will be implemented.

### 1.2 Structure

The document comprises the following sections:

- **Chapter 1** provides/constitutes an introduction to the content of the deliverable and its structure;
- **Chapter 2** provides the (theoretical) background on the methodology used for this deliverable, drawing from the pertinent academic literature, as well as the previous activities carried out in the earlier phases of the project. Moreover, an overview of the Pilot tests to be implemented, detailing their objectives, structure and timeline, is also provided;
- **Chapter 3** presents the overall strategy that will be adopted for the testing cycles of the platform. It includes the testing sample and the envisioned indicators to measure the social innovation of the platform;
- **Chapter 4** sums up the strategy outlined to carry out the activities related to Task 6.1 and its links with the parallel and future activities of the project.
2. Pilot test overview

2.1 Background

Activities carried out previously in the project, as well as a review of the relevant research literature on technology adoption, formed the basis upon which this deliverable was conceived. In this section an overview of both will be thoroughly presented.

Starting from the activities carried out previously in the project, an important input is described in deliverable D1.2 - Use Cases & User Scenarios. That deliverable contains the analysis of data obtained from two investigations carried out targeting two different groups. The first investigation resulted in the construction of an online quantitative questionnaire, which involved FEBEA members’ clients as well as the general public. The clients were targeted thanks to the elaboration of User Groups, a set of simple scenarios of potential users and the functionalities that they could find useful in the future platform. The second investigation was based on a qualitative questionnaire, carried out in the form of open interviews with the employees of the FEBEA members participating in the project. In this case, the inquiry was less structured and allowed us to gain a valuable insight into what the financial experts find useful for their clients.

That deliverable, starting from the User Groups and finishing at the Use Cases, has provided an overview of what the platform prototype should include and the likely needs that future platform users may have. The quantitative questionnaire suggests that there is an interest from the “bottom up” to have a trusted, reliable platform that can provide certain services. In fact, an issue that emerged is that many people do not know where to look when searching for financial information on the Internet.

A major conclusion of the data analysis carried out in D1.2 was indicative of the existence of a market for personal finance training. Another important finding concerns the discrepancy between the high figures for those who do not know how to seek for information regarding changes in financial trends and the significant, but still low, figure for the use of specialised websites. This further indicates that the PROFIT project is likely to cater to a strong existing need in the market for financial knowledge and information.

In addition to this, the interviews with employees of FEBEA members have highlighted the positive impact that such a platform will have on their clients in terms of client protection, given the fact that more informed citizens can make better financial decisions. Reflecting the more direct relationship between ethical banks with their customers, it was suggested to think of ways to foster a direct contact between the clients and the platform, in order to get familiar with its features.

This feedback was then analysed and the result transformed into Use cases: five scenarios describing the activity of a user in the platform and the functionalities that need to be implemented in order to have a functioning prototype. These scenarios are the final outcome of a concerted work that takes into account the different expertise and perspectives of the PROFIT consortium. The Use case approach provides a basic view of how the system should work and what should be available in the system for the tester. Use cases describe the whole flow of particular actions the tester should do in order to perform a certain task. Such an approach helps the design of the platform by implementing this functionality in the system in order to be able to determine which steps could be automated and which steps need to be performed by the user.
Obviously, the functionalities to be tested have to be practically feasible. Another factor to take into account is the diversity of the sample: both the interviews and the questionnaires were delivered in six countries, all within the EU but with very different economic characteristics and regulation.

Concerning the literature on technology adoption, understanding user needs and requirements plays an important role in development of any IT system in order to improve the way people will adopt and enjoy using it. It is therefore commonly known that developers of IT systems must be able to have a holistic understanding of the current situation of the users, the actions they perform and their aims. The starting point in facilitating this user adaptation of an IT-system is the cumulative task of collecting knowledge gained from the users’ goals through enquiries that form a set of system requirements. This process strives to identify user needs and is known as “Need-finding”, which continues during each and every phase of system development and design process (Bergvall-Kåreborn et al., 2008; Bergvall-Kåreborn & Ståhlbröst, 2007; Bergvall-Kåreborn & Ståhlbröst, 2008; Ståhlbröst & Bergvall-Kåreborn, 2007, 2008; Ståhlbröst & Holst, 2006, 2006).

Users want products or services that improve their quality of life and work; that is what motivates them to buy and use a specific product or service (Gerstheimer & Lupp, 2004). In other words, the user is mostly interested in his or her individual benefit, hence the possibilities for profitable applications and services and for success in the increasingly competitive market can only be sustained by knowledge of the users’ needs and motives (Gerstheimer & Lupp, 2004).

In recent years, a number of influential models investigating intentions to adopt technology have emerged. These models have their origins in the disciplines of psychology, information systems and sociology (Venkatesh, Morris, Davis, & Davis, 2003). Among the best known is the Technology Acceptance Model (TAM) (Davis, Bagozzi, & Warshaw, 1989).

Based on the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM) deals more specifically with the prediction of the acceptability of an information system. The purpose of this model is to predict the acceptability of a tool and to identify the modifications that must be brought to the system, in order to make it acceptable to/by users. Subjective norms is a TRA construct (Fishbein & Ajzen, 1975) that refers to the motivating influence of our perceptions of what we think significant others (e.g., family) want us to do. Venkatesh and Davis (2000) found that subjective norms had a significant influence on perceived usefulness and behavioural intentions when use of the technology was mandatory. When technology use was voluntary, subjective norms still influenced perceived usefulness, but did not have a direct influence on behavioural intentions.

As demonstrated in the TRA, the Technology Acceptance Model postulates that the use of an information system is determined by the behavioural intention, but on the other hand, that the behavioural intention is determined by the person’s attitude towards the use of the system and also by her perception of its utility. According to Davis, the attitude of an individual is not the only factor that determines her use of a system; the impact it may have on her performance is also an influencing/a decisive factor. Therefore, even if an employee does not welcome an information system, the probability that he/she will use it is higher if he/she perceives that the system will improve his/her performance at work. Nevertheless, it should also be mentioned that between two systems offering the same features, a user will consider the one that he/she finds easier to use as more useful than the other (Dillon and Morris, on 1996).

In the end, Davis (1985) concluded that people tend to use or not to use a system to the extent that they believe it will help them perform their job better (perceived usefulness). Furthermore, the estimation of the effort required to use a system can directly affect system usage behaviour (perceived ease of use). More formally, Davis (1985) defined perceived usefulness and perceived ease of use as follows:
• **Perceived usefulness**: the degree to which an individual believes that using a particular system would enhance his or her job performance.

• **Perceived ease of use**: the degree to which an individual believes that using a particular system would be free of physical and mental effort.

Indeed, the Technology Acceptance Model hypothesizes a direct link between perceived usefulness and perceived ease of use.

According to Davis et al. (1986), perceived ease of use also influences in a significant way the attitude of an individual through two main mechanisms: self-efficacy and instrumentality (tasks the tool helps to accomplish). **Self-efficacy** is a concept developed by Bandura (1982) which explains that the easier a system is to use, the greater should be the sense of efficacy of the user. Moreover, a tool that is easy to use will make the user feel that he/she has a control over what he/she is doing (Lepper 1985). Efficacy is one of the main factors underlying intrinsic motivation (Bandura on 1982; Lepper 1985) and it is what illustrates here the direct link between perceived ease of use and attitude. Perceived ease of use can also contribute in an instrumental way in improving a person’s performance. Due to the fact that the user will have to deploy fewer efforts with a tool that is easy to use, he/she will be able to spare efforts to accomplish other tasks (Davis 1986).

However, in the analysis of the evaluation results, care should be taken in the assessment of their validity also outside the testing phase. Several studies on TAM are carried in a controlled environment. Therefore, results obtained from these studies cannot be automatically generalised to the real world (Lee, Kozar & Larsen 2003). As many researchers argue, testers may have different motivations, such as obtaining rewards, and so on (Legris et al. 2003, Yousafzai et al. 2007, Lee et al. 2003).

### 2.2 Pilot tests objectives

The aim of the Pilot tests is to assess the development of the Platform: the initial set of PROFIT services and applications will be introduced to the customers of FEBEA member organizations, and an evaluation of the service acceptability, effectiveness, and cost-benefits (in terms of time spent/financial literacy improvement) will be carried out, in order to validate these aspects of the project deployment plan. In particular, the pilot tests should help identifying requirements for modification of the prototypes of the platform on the basis of evaluation results, and, in general, demonstrate the feasibility and the viability of the PROFIT concept.

For that reason, the feedback of the pilot users will be communicated to the developers of the platform and to the partners in charge of the specific functionalities that are going to be tested. Afterwards, an analysis will be performed in order to assess the main strengths and opportunities of the PROFIT platform, as well as its weaknesses. Moreover, it will help us understand the processes of collective awareness and evaluate the impact of PROFIT in terms of Social Innovation.

Pilot tests are strongly linked with activities carried out under WP5, as initial feedback received from pilot organizations (D6.2, D6.3) will be incorporated in the different versions of the platform, thus creating the Proof of Concept PROFIT Platform. Finally, the testing phase should validate the integrated platform as a whole, evaluating whether it satisfies the requirements defined in WP1 and analysed in Deliverable D1.2. One important outcome of D1.2 was the delineation of five PROFIT Use Cases, which were used for assessing the technical feasibility of the platform’s functionalities in Deliverable D5.1. The full description of the Use Cases is available in Appendix II.
To summarise, the functionalities (or features) of the platform listed and described in the Use Cases are based on the user requirements collected during the activities of deliverable D1.2. Such requirements have been identified and collected under ‘Functional Requirements’ (Wikipedia a) and ‘Non-Functional Requirements (Wikipedia b)). This process has been conducted following the FURPS model2 (Wikipedia c)). Below, the main thematic categories of features and functionalities identified in D1.2, are listed:

1. **User friendliness** (user interface design, ease of use, friendly language…) – Appeal (visual appeal, appearance, user experience…) – Easy navigation (ease of navigation, structure of information…);
2. **Ease of access** – **Mobile** (fast and easy access from every device and operating system);
3. **Accessibility** – **Localisation** (design taking into consideration people who experience disabilities and adaption of the platform to local specificities);
4. **Privacy** – **Security** (including anonymity concerns);
5. **Quality of content** – **Up-to-date information and notifications** – **Q&A Forum** (reliable and unbiased information, regularly updated and accurate information, newsletters, daily notifications, ask questions to experts or the community, provide answers);
6. **Communication** – **Social network** (socialise, communicate and discuss with other people via a or personal messaging);
7. **Financial services** – **Personalised support/advice** (having the possibility of investing, buying financial services, portfolio management, getting advice and support regarding personal financial decisions).

The previous activities in WP1 and WP5 led to a concept ready by M15, which represents the generated needs from the first steps in the project.

The needs in focus here are the needs that motivate users to adopt and use a particular IT system, i.e., what triggers their motivation.

The aim of the three evaluation cycles is to make sure that the involved users agree with the basic objectives of the developed concept. This means that the basic objectives and functions of the system should be related to the generated needs of the system in order to make sure that these are consistent.

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2 FURPS is an acronym representing a model for classifying software quality attributes (functional and non-functional requirements):

- **Functionality** - Capability (Size & Generality of Feature Set), Reusability (Compatibility, Interoperability, Portability), Security (Safety & Exploitability);
- **Usability** (UX) - Human Factors, Aesthetics, Consistency, Documentation, Responsiveness;
- **Reliability** - Availability (Failure Frequency (Robustness/Durability/Resilience), Failure Extent & Time-Length (Recoverability/Survivability)), Predictability (Stability), Accuracy (Frequency/Severity of Error);
- **Performance** - Speed, Efficiency, Resource Consumption (power, ram, cache, etc.), Throughput, Capacity, Scalability;
- **Supportability** (Serviceability, Maintainability, Sustainability, Repair Speed) - Testability, Flexibility (Modifiability, Configurability, Adaptability, Extensibility, Modularity), Installability, Localizability.

The FURPS+ model is now widely used in the software industry. The + was later added to the model after various campaigns at HP to extend the acronym to emphasize various attributes.
Given this huge number of variables, it is important to keep the evaluation process flexible; that is why the provided framework as well as the evaluation strategy described in this deliverable are/were intentionally kept quite general. More details will be provided in the subsequent deliverables that will be part of WP6.

### 2.3 Test cycles and schedule

In order to provide the project developers with relevant feedback on the subsequent prototypes of the platform that will be designed, WP6 includes 3 test cycles strictly linked with the different version of the platform that will be realised under WP5. The cycles will be organised as follows:

- **1\(^{st}\)** test cycle, M19-21 (July-September 2017): it will assess the 2\(^{nd}\) prototype of the platform (D5.3), corresponding to D6.2;
- **2\(^{nd}\)** test cycle, M25-27 (January-March 2018): it will assess the updated proof of concept prototype of the platform (D5.4), corresponding to D6.3;
- **3\(^{rd}\)** test cycle, M32-36 (September-December 2018): it will assess the proof-of-concept version of the platform (D5.5) and provide an overview of its impact in terms of Social Innovation, corresponding to D6.4.

Each test cycle will include:

- the performance of the tests by selected testers (see following chapters);
- the collection of feedback;
- translation (if needed) and analysis of feedbacks received;
- the drafting of evaluation reports summarising the results of the test (D6.2, 6.3, 6.4).

Table 2.1 summarises the activities to be carried out per each cycle and their schedule.
Table 2.1 – Evaluation framework timetable

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Indicative, timing could be slightly adjusted according to the status of development of the platform.
3. Methodology

Two main pillars of the testing phase are who will test what. Both components of the evaluation strategy will be described in the sections below. Section 3.1 will focus on the testers, whereas Section 3.2 will outline the main features that will be tested throughout the cycles.

3.1 Participants/Testing community

Due to the highly changing nature of the testing cycles in terms of features, content, aspects of the platform and so on, it is important to have a reliable group of people to test the platform in a controlled way. To this end, the strategy adopted by the PROFIT Consortium is two-fold.

On the one hand, 6 members of FEBEA, the European Federation of Ethical and Alternative Banks and Financiers, from 6 countries agreed to provide the test base among their clients/networks. This provides a wide array of EU countries in which the platform will be tested, with different attitudes to finance and saving. The six financial organisations are:

- APS Bank (Malta): the Bank managed to position itself as a cost efficient financial institution, whilst retaining personal banking as its major strength. Its mission statement is to offer quality financial services in an efficient, cost effective and ethical way inspired by the social commitment of its shareholders.
- Cooperative Bank of Karditsa (Greece): offers a wide range of products and services addressing the needs of businesses, entrepreneurs and individuals while retaining a small exposure to risk and maintaining a healthy status for the Bank’s balance sheet.
- Crédal (Belgium): Crédal is a cooperative whose social purpose is to promote a more just and supportive society, especially as regards the use of money. Crédal offers ethical investment; alternative credit; project support.
- ebanka (Croatia): ebanka is an ethical development bank owned entirely by its own members. Instead of high profits, its primary goals are contributing to a better society and the well-being of its co-owners.
- Fondazione Culturale Responsabilità Etica - FCRE (Italy): established in 2003 by Banca Popolare Etica, it operates nationally and internationally with the aim of spreading the principles of Ethical Finance. FCRE actively contributes to the debate on the issues of Finance for a cultural reform of the finance and credit system in a perspective of ethics and social assistance in social and environmental fields.
- Sklad05 (Slovenia): a private financial institution established to finance social entrepreneurship and social innovation. Based on its Impact Investment Ready Service it offers several instruments of support and funding.

4 https://www.apsbank.com.mt/
5 http://www.credal.be/
6 https://www.ebanka.eu/en
7 https://www.fcre.it/chi-siamo
8 http://www.sklad05.si/stran/13/fund05-angleska
The number of individual testers to be involved in the testing phase will be defined keeping in mind the need to analyse and process the feedback according to the time available for each test cycle. Moreover, in order to provide relevant feedback and facilitate the use of the platform by the testers, the testing will be carried out in the platform translated in each FEBEA member’s native language (Croatian, English, French, Greek, Italian, and Slovenian). FEBEA members could involve a total of around 120 users for the testing of the translated platform.

On the other hand, for the PROFIT platform to be accessible to everyone, it was necessary to define a set of “typical users” of the platform in terms of social, educational, and financial terms. Such way of defining users is typical of mostly developed countries and is transversal in its diffusion. To this end a set of 12 User Groups was defined both internally and with the help of the User Forum during the development of T1.2 (for the full list and description of User Groups, see Appendix II).

Each User Group is a profile of a likely future user of the platform, described in the form of short narratives (Boschetti, Golfarelli, Rizzi, & Turricchia, 2014). The structured narratives contain an actor in a certain role (the user), who wants to achieve a goal by making use of the platform (Fancott, Kamthan, & Shahmir, 2012). This makes the user value-centric in that they reflect what the user would like the platform to do as opposed to how this should be (technically) done (O’hEocha & Conboy, 2010). User stories are a great step towards extracting the system requirements, as they express a problem that the system needs to develop a solution for. In this way, they provide light specifications that can later be more detailed by continuous interaction with the users, but at the same time they need to be sufficiently described to be able to estimate the development complexity.

The set of testers of the platform will derive from the intersection between FEBEA members in different countries and the User Groups. That is, FEBEA members will select among their clients/networks a number of users that belong to as many User Groups as possible and will introduce the PROFIT platform to them. The envisioned total number of testers from all six FEBEA members is around 120 people, drawing from the 12 User Groups. To support them in having an experience as smooth as possible, some tutorials will be embedded in the platform in the form of “how to” videos.

As some of the User Groups are typically not familiar with the English language (in particular the elderly), it is fundamental that the Platform be translated in local languages before the starting of the testing phase. Should the translation be unavailable for one or more test cycles, testers will be chosen according to their knowledge of the English language, even if this might affect the number of testers involved in the evaluation process.

Additionally, a brief document containing the main guidelines and information necessary for users in order for them to access the platform in a user-friendly way, will also be produced. Such document will contain not only information about the platform, but also the contact details of the employees of the relevant FEBEA members. They, in turn, will be able to assist the clients in their native language and keep the testers engaged with the platform.

In addition to this, it is important to also collect the opinions of financial professionals that deal with the financial requests of their clients on a daily basis, as they have a deep knowledge of their clients’ needs in terms of financial literacy. Such professional figures were already involved in the analysis of Use Cases and User Requirements (T1.2). Representatives of FEBEA members will therefore provide an overall evaluation of the different versions of the platform to be tested, providing the point of view of banking and financial professionals. Before the beginning of the evaluation cycle, a webinar will be held by the platform designers, targeting the employees of
FEBEA's members. This way the employees will be able to learn how the platform functions beforehand and be able to provide assistance to their clients.

### 3.2 Functionalities to be tested and procedures for testing

This section will outline the main procedures that will be adopted by each member of the Consortium, in order to assess the features that relate to their part of the work for the platform. To clarify, the overall evaluation of the platform will follow two main strands. The first concerns the general satisfaction of the customer, the ease of access and use, and so on (qualitative evaluation). This will form the main content of the deliverables of WP6 – Proof of Concept and Evaluation and will be analysed through an evaluation questionnaire (see Appendix I). The second one concerns the specific features that are the backbone of the project and the platform and are being developed in the appropriate WPs. These features will be tested via specific procedures (technical evaluation). In this regard, it should be noted that more details will be available in the respective WPs and deliverables that deal with the related platform features. Nevertheless, below we provide the general approach followed for each WP.

However, before delving into the actual evaluation plan, it is important to describe a preliminary activity that will be carried out in order to facilitate the first interaction with the platform of not only the testers, but also the personnel of FEBEA's members. A set of User Days could be organised at each FEBEA member’s premises, inviting not only a group of their employees but also their clients. The reason for this approach is twofold. On the one hand, training the personnel will facilitate the use of the platform inside each FEBEA member, with an expected benefit in terms of feedback to the platform designers and in customer support towards the testers. Indeed, they know and have the trust of their clients, thus creating a favourable environment during the testing cycles. On the other hand, the testers will be able to see the platform “in person”. That is, they will have the opportunity to interact with other people, ask questions, see the platform in use by people who already know it and will be more motivated in using it also once at home.

The User Days will be organised before the beginning of the testing phase of the translated platform and will include a version of the platform that will be as close as possible to the one they will test later. It should be noted that this is the general approach to introduce the platform to testers and employees: each member will modify the approach taking into account their own circumstances and modus operandi. For example, one member may have several small workshops in different branches, another may prefer to have a webinar/phone call with the future testers, and so on.

Concerning the features to be tested for **WP1 – Requirements and Functional Design**, the main features to test/to be tested are the incentive and recommendation mechanisms. The goal of the incentive scheme is to motivate users to actively participate and contribute to the platform (e.g. in the various discussions and polls of the platform) by creating, rating, commenting, and uploading relevant information and content. Incentive mechanisms will be based upon a reputation scheme which will promote the most reputed/contributing users of the platform by providing them with certain privileges. The means to verify the success of such incentive mechanisms is a set of questions that are part of the evaluation questionnaire that testers will fill after using the platform prototype. An extra evaluation activity focused on the user's opinion towards the incorporation of certain gamification elements (e.g. private leaderboards) on the user dashboard will also be
conducted. More specifically, the participants will be randomly assigned into two distinct groups (control and treatment group), before the evaluation period begins. The participants that belong in the first group will not have access to the gamification element (in our example, the private leaderboard), whereas the participants belonging in the second group will be able to gain access to it, showing their rank among users with similar scores. At the end of the intervention, the participants belonging in both groups will be asked to answer the aforementioned questions, so that we will be able to investigate the effect of the leaderboard on their motives and opinion towards the user dashboard. Moreover, users belonging in the treatment group will also have to answer to some questions regarding the design of the leaderboard.

The goal of the recommender scheme is to provide personalised recommendations to the users of the platform related to articles and other posts of their interests, educational material catering to their needs and preferences, and other users that share similar interests. The means to evaluate the recommender scheme will be through a set of questions incorporated in the evaluation questionnaire, as well as algorithms considering the feedback provided by the users themselves concerning the received recommendations, e.g. the ratings the users provided to articles that have been recommended to them.

The main features to be tested for WP2 – Linked Data Life Cycle are visualisation tools, crowdsourcing and the recommender engine (the latter also related to WP1). In this case, the features concern how the users will be able to access relevant content and how easily. The means to verify the quality and relevance of what should be visualised are questions to users, as well as more automated feedback, such as counting the number of clicks on the relevant tools. Crowdsourcing features will be assessed by the number of clicks, how the Knowledge Graph (which will contain particular instances of data, for example, data about individual users, individual news articles, and data from particular educational materials) grows and questions on how intuitive the task is.

WP3 – Financial Literacy for Informed Decision-Making will develop performance, knowledge-based tests and self-assessment methods, which incorporate users’ feedback, to assess the levels of financial literacy. The key objective of this work package is to clarify and elucidate the conceptual nexus of the user’s financial literacy whilst formulating tools and assessment criteria for its measurement and targeted enhancement. Financial knowledge will be tested ex ante and ex post, i.e. before the utilisation of the platform and after, via a set of questions. There will also be specific tests on each of the 10-15 units of material, which will test knowledge before and after to capture potential improvement, regarding each specific round of material of financial education toolkit. Participation in these quizzes will be optional, but incentive-compatible, i.e. participants will be rewarded in terms of status in the platform each time they fill a quiz.

WP4 – Market Sentiment-Based Financial Forecasting will have two main features to test: the Market sentiment tool and the Financial Forecasting tool. Both will be mainly evaluated by comparing them to the main indicators available on the market (other websites, European Commission...). However, testers will provide feedback in the evaluation questionnaire on their satisfaction on such tools.

Concerning WP5 – System design and Integration, the goal is to evaluate the users’ satisfaction regarding the actual usage of the platform. Apart from this (see the paragraph on WP6 below), feedback about deficiencies will be solicited continually by placing a “this does not work/this is confusing” button on all platform pages. This button will be linked to a short form which will allow testers to signal if the functionality isn’t working for them in a way they’ve expected and provide a brief description of the problem, the expected behaviour, possibly allowing the attachment of a
screenshot. Information provided by users will also be enriched by the platform itself, as it will automatically fill in additional details such as date and time, URL, etc. The final goal is to keep the form short in order to avoid losing information due to users being discouraged by big complicated forms at some hard-to-find location. All received feedback will be acted upon and a solution will be devised, either by improving the platform itself or enriching the tutorial embedded in the platform.

Finally, WP6 – Proof of Concept and Evaluation will assess the testers’ general satisfaction with the platform (ease of use, usefulness etc.), along with an overall evaluation for each main functionality, and will provide preliminary analysis in terms of the platform’s social impact. Additionally, the evaluation questionnaire (see Appendix I) will be implemented directly on the platform - this way a lot of aggregate personal information would be automatically collected, without the user having to open a new page on the browser and more generally providing information that is already available on the platform (this will be easier for testers and will also protect their personal information better, as the information will not be spreading to third-party cloud services, etc.).

As for the analysis of the data collected via these different testing procedures, each partner will examine the results related to its own WP/functionality, while FEBEA will provide an overall analysis referred/referring to the general satisfaction regarding the platform’s prototypes, according to the answers provided to the evaluation questionnaire.

It should also be considered that the above-mentioned functionalities will be implemented gradually and therefore some of them may not be ready for the first and/or second testing cycle. Therefore, the technical evaluation procedure and the evaluation questionnaire will be adapted according to the functionalities available at the beginning of each testing cycle.

Concerning (any) ethical issues linked to the collection of data, the personal identity of the (user’s) data will be strictly protected from third parties and will only be used for testing purposes within the project. The PROFIT platform will perform user studies and tests and will operate with potentially sensitive data that are volunteered, obtained through behaviour analysis or inferred from the first two types. The data may include, but are not limited to, personal information about the user such as: name, date of birth, interests, location, images, texts, opinions, or relations to other users, behavioural data such as clicks but also information derived from volunteered and behavioural data. It will not be transmitted to third parties, and will be handled with the experiment participants’ explicit consent/with the explicit consent of the experiments’ participants after clearly explaining (to them) what type of data will be collected, and how they will be used, stored and destroyed after the experiments.

Consent will be obtained by formulating acceptance terms of usage, and depending on how far-reaching data collection is, informed consent will be requested at several levels of agreement (e.g. people may agree that PROFIT analyses the data they upload, but not their user interactions, because this may intrude deeper into their privacy). Part of the terms of usage will be informing users about the legal aspects of obtaining information for evidential purposes. Taking all necessary actions described above, to our knowledge no burdens (to our evaluation studies) exist, since participation is voluntary and anonymous, and informed consent is requested in all cases.
3.3 Focus on Social innovation assessment

The second Deliverable concerning WP6 – D6.2 – will incorporate the results of the peer reviews of the service as well as a preliminary analysis of the Social Innovation related to PROFIT, through dedicated indicators. Such indicators will focus on what PROFIT responds to and on the processes it relies on that measure its impact. It should be noted that it is necessary to consider both the process and the outcome of innovation in order to develop social innovation indicators and/or scoreboards. Indeed, the PROFIT project strives to bring social innovation in the field of financial awareness and sustainability by creating a platform that is accessible and has content created by its own users. In order to assess the social innovation of the project it is useful to define first what social innovation means (Stanford 2017).

Social innovation is a novel solution to a social problem that is more effective, efficient, sustainable, or just than current solutions. The value created accrues primarily to society rather than to private individuals. Although social entrepreneurship and social enterprise have become popular rallying points for those trying to improve the world, social change can happen outside of them. These two notions are positive ones, but neither is adequate when it comes to understanding and creating social change. In fact, social innovation is a better vehicle. Social innovation focuses attention on the ideas and solutions that create social value — as well as the processes through which they are generated, not just on individuals and organizations.

Additionally, the term Digital Social Innovation is emerging as a way of indicating digitally enabled or supported social innovation (Bellini et al. 2016). Social media, connected to the Internet of Things, big and open data, and crowdsourcing platforms, are seen as new instruments for fostering social innovation both in its institutional and community-driven understanding. While social innovation proposes new face-to-face solutions to social issues, for example engaging a specific local community in the renewal of a neighbourhood, digital social innovations are expected to create new online instruments (new ICT services) that enable social innovation and take advantage of the network effect typical of the Internet.

Another important aspect (Bellini et al. 2016) is related to the transparency and openness of the ICT solutions proposed. In fact, every social innovation initiative can make use of ICT tools such as management software, social networks for promoting their initiatives, websites etc., but the added value of Digital Social Innovation is on instruments that also foster a new use of ICT which is more aware and respectful of users’ rights in terms of access, privacy, possibility to use and re-use the solutions generated, and so forth.

Methodologies for assessing the outputs and the impacts of social innovations are still at an early stage of development (Bund et al., 2013). The analyses conducted so far are mainly based on case studies and qualitative methodologies; so that comparisons and data aggregation are not yet available (Cajaiba-Santana 2014; Biggs et al. 2010; Smith and Seyfang 2013).

A good starting point that will be further developed is the impact assessment for the CAPS projects (Bellini et al. 2016), which considers six sub-categories, four of which are relevant to the PROFIT project in particular and are described below:

Impact on community building and empowerment: it gathers data about the users of the PROFIT platform and how they use the platform; investigates how PROFIT projects can support the empowerment of online and local communities; investigates the PROFIT community itself, the
internal level of collaboration and the relationship with other stakeholders. This social impact subcategory corresponds to a synthetic index which is composed of 3 dimensions:

- Online community building;
- Online community empowerment;
- Impact on Social Innovation and PROFIT communities.

**Impact on information:** under this subcategory, the focus is on the capability of projects to provide access to high-quality information, provide users with the necessary tools for navigating information, and positively influence information asymmetries. This subcategory investigates an aspect that has strong influence on other aspects, such as “Impact on ways of thinking, values and behaviours”, “Impact on community building and empowerment”, and political impact as a whole. In fact, having access to information and being supported in sharing information is a condition sine qua non for changing opinions, habits and being civically and politically engaged. The impact on information index comprises three dimensions:

- Access to information and sharing of information;
- Quality of information;
- Data management policies.

**Impact on ways of thinking, values and behaviours:** this area of impact tackles the changes introduced in citizens’ way of thinking and behaviours, especially as related to more sustainable individual and collective behaviours and lifestyles. It is not easy to monitor changes in opinions, ethical orientations and behaviours since, even when observing a shift, it is very difficult to associate that change to a defined input. The issue is complicated by the fact that changes in opinions and behaviours are influenced by the number of people that decide to assume certain behaviours: the more people assume a new behaviour the easier it becomes to see this change spreading across the population (network effect). The dimensions investigated within this index are:

- Changes in opinions/ways of thinking;
- Changes in behaviours.

**Impact on education and human capital:** this subcategory investigates if, and to what extent, projects are working on the transfer of their research results and, more generally, the knowledge made available by the projects to users. With reference to human capital, this term refers to the competencies, skills and abilities that workers have or acquire through formal and informal education and on the job training and that constitute an important productive factor of any organisation (profit or not-for-profit). The aim is to understand if the PROFIT project will improve the human capital of its users and/or of the professionals working in the project. Special attention is dedicated to e-Skills, as a lack of such skills may result in the impossibility to benefit from Digital Social Innovation.

- Training provided by the project;
- Impact on human capital;
- Change in training curricula, educational policies, and personal investments in education.
It should be noted that such factors represent the starting point and general framework that the platform evaluation will follow throughout the evaluation cycles. Specific questions based on these factors are incorporated in the evaluation questionnaire and could be integrated according to the feedback and input received. In particular, the initial questions that will provide inputs for the analysis of PROFIT Social Innovation are the following:

- The platform helped me to improve my financial knowledge and awareness (1- Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5- Strongly agree)
  - If you replied "1" or "2" to the previous question, please briefly explain why
- The platform helped me to take informed financial decisions (1- Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5- Strongly agree)
  - If you replied "1" or "2" to the previous question, please briefly explain why
- I think that contributing to the platform is useful as it helps other users (0 - Didn’t notice it at all, 1 - Completely disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 - Completely agree)
  - If you replied "1" or "2" to the previous question, please briefly explain why
- Please rate on a scale from 1 to 5 the quality of the following benefits the PROFIT platform seeks to provide (1 - Very low, 2 – Low, 3 - Neither low nor high, 4 – High, 5 - Very high):
  - Financial education material
  - Financial forecasting and market sentiment graphs
  - Recommended content and users
  - Financial literacy test
  - User Dashboard presenting your impact graph, reputation, user level, etc
  - Search Functionality
  - Articles, Polls, Discussions and other posts
  - If you replied "1" or "2" to one of the previous questions, please briefly explain why

Such questions could be adjusted, edited or integrated according to feedbacks received during the testing phase.
4. Conclusion

This deliverable represents the first step of a long phase of testing of the PROFIT platform. As already explained, this is an iterative process with a multitude of stakeholders and therefore it is impossible at this moment to lay down a more detailed plan, describing each step. On the contrary, the importance of this deliverable is that it provides a set of goals and a methodology on how to achieve them given the fact that the actual details are expected to change as more feedback is gathered and the wrinkles ironed out.

An important feature/aspect of this deliverable is the depiction of the overall evaluation strategy. It puts together not only the testing methodology of WP6 and WP5, which are intimately related to the design and testing of the platform as a whole, but also how each one of the main features of the platform will be assessed and by whom.

As the Platform is being developed gradually, this evaluation plan will have to be adapted according to the status of implementation of the functionalities that are going to be tested.

Another added value that the testing of the platform has provided is the formation/presence of a testing community that has already been identified and analysed: the clients of the FEBEA members. Thanks to the in-depth analysis of their needs in deliverable D1.2, we now have a better picture of what they want in a financial awareness platform. Such analysis also had an important impact in WP5 via the creation of Use Cases, a set of scenarios of platform use that helped in the design of the platform itself for WP5 and WP6. The testers will provide feedback via a brief questionnaire designed to assess the perceived ease of use and usefulness of PROFIT that will pop up after the use of the platform on the platform itself. Potential ethical issues have been identified and dealt with.

A further step that could be used to familiarise and motivate the testers is the possible organisation of a User Day at each FEBEA members’ at the beginning of the testing phase. This way the testers would be able to see/interact with the platform directly and ask questions to both the financial experts of FEBEA members and the platform designers.

Finally, an additional feature that will be assessed throughout the testing phase and that will be constantly improved concerns the Social Innovation that the PROFIT platform will deliver to its users. It will constitute a part of the activities related to task T6.2 – Pilot Evaluation and Assessment towards Social Innovation; nevertheless, an initial overview has already been carried out in this deliverable.

Looking into the future of WP6 and the overall PROFIT project, the first prototype to be reviewed by FEBEA members will become available in M18. It is in this time where the many different activities carried out during the previous months in different WPs will come together organically for the first time. Moreover, the evaluation strategy outlined in this deliverable will be put to the test in conditions that will become progressively similar to the use of the platform in “normal” conditions. At the end of this process, the proof-of-concept of the PROFIT platform (M24) will be demonstrated.
References


Appendix I: Evaluation Questionnaire

PROFIT Tester Feedback Form

Welcome to the PROFIT Online Questionnaire!

The EU HORIZON 2020 project PROFIT is developing a financial awareness platform providing the following tools to its users:

- Personal financial educational toolkits available to the wider public;
- Crowdsourcing tools that will process financial data and extract and present collective knowledge;
- Advanced forecasting models that exploit the market sentiment in order to identify market trends and threats;
- Novel personalized recommendation systems to support financial management according to the user’s profile;
- Reputation-based incentive mechanisms to encourage the active participation and contribution of citizens through many different channels (e.g., posting & rating of financial articles, voting in relevant polls, questions & answers forums)

In order to elicit the user’ requirements concerning what they would like from such a platform to provide, we ask you to fill in the respective questionnaire, helping in this way to build a successful financial awareness platform.

All the provided data will be anonymously processed and the results will be used to improve the platform and be presented in the project deliverables and publications.

With the completion of this survey you agree to the processing of the provided information for the above mentioned purposes.

Thank you for your support!

*Mandatory field

DEMOGRAPHICS

1. Are you ...? *

☐ Male

☐ Female

2. Please state your age, as in number of years *

This draft will be adjusted according to the functionalities available for each testing period.
3. Please state your age, as in number of year *

4. Please state your age, as in number of year *

5. Please state your age, as in number of year *

6. Reflecting on your status in terms of financial awareness and needs, please tick the demographic category (user group) that you think describes you best. You can select more than one answer. *

- Entrepreneurs/latent entrepreneurs/social entrepreneurs/self-employed
- Elderly/retirees/pre-retirees
- Migrants/Members of an ethnic minority
- Children/Parents of young children
- Customers: Indebted/Overindebted households
- Customers: Investors/Potential investors/Depositors
- Unemployed/trainees
- Active citizens/taxpayers
- Mortgage owners/home owners/first-time buyers
- Professionals in financial services/financial experts
- Government executives and political-party members/local authorities
- Collective investors/borrowers/third sector organisations
USEFULNESS OF THE PLATFORM:

7. The platform helped me to improve my financial knowledge and awareness

☐ 1 - Strongly disagree
☐ 2 - Disagree
☐ 3 - Neutral
☐ 4 - Agree
☐ 5 - Strongly agree

8. If you replied "1" or "2" to the previous question, please briefly explain why:

9. It helped me to take informed financial decisions

☐ 1 - Strongly disagree
☐ 2 - Disagree
☐ 3 - Neutral
☐ 4 - Agree
☐ 5 - Strongly agree

10. If you replied "1" or "2" to the previous question, please briefly explain why:
11. I found it overall useful and corresponding to my needs

☐ 1 - Strongly disagree
☐ 2 - Disagree
☐ 3 - Neutral
☐ 4 - Agree
☐ 5 - Strongly agree

12. If you replied "1" or "2" to the previous question, please briefly explain why:

EASE OF USE OF THE PLATFORM:

13. It is user friendly

☐ 1 - Strongly disagree
☐ 2 - Disagree
☐ 3 - Neutral
☐ 4 - Agree
☐ 5 - Strongly agree

14. If you replied "1" or "2" to the previous question, please briefly explain why:

15. It was easy to learn how to use it

☐ 1 - Strongly disagree
☐ 2 - Disagree
☐ 3 - Neutral
16. If you replied “1” or “2” to the previous question, please briefly explain why:

17. There is a convenient and obvious way to move between related pages and sections

18. If you replied “1” or “2” to the previous question, please briefly explain why:

19. Good navigational feedback is provided (e.g. showing where you are in the site)

20. If you replied “1” or “2” to the previous question, please briefly explain why:

21. The functionality of buttons and controls is obvious from their labels and design
22. If you replied "1" or "2" to the previous question, please briefly explain why:


23. The user dashboard is pleasant to look at and feel that will engage users


24. If you replied "1" or "2" to the previous question, please briefly explain why:


Satisfaction:

25. I am satisfied with its use and would recommend it to others
26. If you replied "1" or "2" to the previous question, please briefly explain why:

27. Are market sentiment indexes presented in a concise way?

28. If you replied "1" or "2" to the previous question, please briefly explain why:

29. Are you satisfied with the overall financial forecasting analysis?

30. If you replied "1" or "2" to the previous question, please briefly explain why:
VISUALISATION TOOLS AND RECOMMENDER ENGINE:

31. Is it clear how to use the tools (add / remove data, change dates, etc.)?

☐ 1 - Strongly disagree
☐ 2 - Disagree
☐ 3 - Neutral
☐ 4 - Agree
☐ 5 - Strongly agree

32. If you replied "1" or "2" to the previous question, please briefly explain why:

33. Is it clear what is represented in the widgets?

☐ 1 - Strongly disagree
☐ 2 - Disagree
☐ 3 - Neutral
☐ 4 - Agree
☐ 5 - Strongly agree

34. If you replied "1" or "2" to the previous question, please briefly explain why:

35. Are the recommendations you get for educational material useful?

☐ 1 - Strongly disagree
☐ 2 - Disagree
☐ 3 - Neutral
☐ 4 - Agree
☐ 5 - Strongly agree
36. If you replied "1" or "2" to the previous question, please briefly explain why:

__________________________________________________________

37. Are the recommended articles close to your interests?

  □ 1 - Strongly disagree
  □ 2 - Disagree
  □ 3 - Neutral
  □ 4 - Agree
  □ 5 - Strongly agree

38. If you replied "1" or "2" to the previous question, please briefly explain why:

__________________________________________________________

39. Did you find it interesting to receive recommendations about other users with similar interests?

  □ 1 - Strongly disagree
  □ 2 - Disagree
  □ 3 - Neutral
  □ 4 - Agree
  □ 5 - Strongly agree

40. If you replied "1" or "2" to the previous question, please briefly explain why:

__________________________________________________________
**INCENTIVE MECHANISMS:**

Please mark your agreement/disagreement with each given statement.

41. Incentives to participate in the PROFIT platform

<table>
<thead>
<tr>
<th>Statement</th>
<th>0 - Didn’t Notice it at all</th>
<th>1 - Completely disagree</th>
<th>2 - Disagree</th>
<th>3 - Neutral</th>
<th>4 - Agree</th>
<th>5 - Completely agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think that a good reputation score is indicative of the user’s social status in the platform</td>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
<td><img src="image5" alt="Image" /></td>
<td><img src="image6" alt="Image" /></td>
</tr>
<tr>
<td>I enjoyed advancing my level by contributing to the PROFIT platform</td>
<td><img src="image7" alt="Image" /></td>
<td><img src="image8" alt="Image" /></td>
<td><img src="image9" alt="Image" /></td>
<td><img src="image10" alt="Image" /></td>
<td><img src="image11" alt="Image" /></td>
<td><img src="image12" alt="Image" /></td>
</tr>
<tr>
<td>I tried hard to gain points, badges &amp; awards</td>
<td><img src="image13" alt="Image" /></td>
<td><img src="image14" alt="Image" /></td>
<td><img src="image15" alt="Image" /></td>
<td><img src="image16" alt="Image" /></td>
<td><img src="image17" alt="Image" /></td>
<td><img src="image18" alt="Image" /></td>
</tr>
<tr>
<td>I regularly check my activity graphs on the user dashboard to see my progress</td>
<td><img src="image19" alt="Image" /></td>
<td><img src="image20" alt="Image" /></td>
<td><img src="image21" alt="Image" /></td>
<td><img src="image22" alt="Image" /></td>
<td><img src="image23" alt="Image" /></td>
<td><img src="image24" alt="Image" /></td>
</tr>
<tr>
<td>I think that contributing to the platform is useful as it helps other users</td>
<td><img src="image25" alt="Image" /></td>
<td><img src="image26" alt="Image" /></td>
<td><img src="image27" alt="Image" /></td>
<td><img src="image28" alt="Image" /></td>
<td><img src="image29" alt="Image" /></td>
<td><img src="image30" alt="Image" /></td>
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<tr>
<td>I think that a good reputation score is indicative of the user’s social status in the platform</td>
<td><img src="image31" alt="Image" /></td>
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<tr>
<td>I enjoyed advancing my level by contributing to the PROFIT platform</td>
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<td><img src="image38" alt="Image" /></td>
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<td><img src="image40" alt="Image" /></td>
<td><img src="image41" alt="Image" /></td>
<td><img src="image42" alt="Image" /></td>
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<tr>
<td>I tried hard to gain points, badges &amp; awards</td>
<td><img src="image43" alt="Image" /></td>
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<td><img src="image46" alt="Image" /></td>
<td><img src="image47" alt="Image" /></td>
<td><img src="image48" alt="Image" /></td>
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</tbody>
</table>

42. Which of the following motivated you to contribute more to the platform?
<table>
<thead>
<tr>
<th></th>
<th>0 - Didn’t notice it at all</th>
<th>1 - Completely disagree</th>
<th>2 - Disagree</th>
<th>3 - Neutral</th>
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<tr>
<td>I think that a good</td>
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<td>reputation score is</td>
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<td>indicative of the</td>
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<td>user’s social status</td>
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<tr>
<td>I enjoyed advancing</td>
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<td>my level by contributing</td>
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<td>to the PROFIT platform</td>
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<tr>
<td>I tried hard to gain</td>
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<tr>
<td>points, badges &amp;</td>
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<tr>
<td>awards</td>
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<td>activity graphs on the</td>
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<tr>
<td>user dashboard to see my</td>
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<td>progress</td>
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<tr>
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<td>as it helps other users</td>
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<tr>
<td>points, badges &amp;</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>awards</td>
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</tr>
</tbody>
</table>

43. Did you have access to the private weekly leaderboard on your “Activity” page? If yes, please answer to the following questions as well:

<table>
<thead>
<tr>
<th></th>
<th>0 - Didn’t notice it at all</th>
<th>1 - Completely disagree</th>
<th>2 - Disagree</th>
<th>3 - Neutral</th>
<th>4 - Agree</th>
<th>5 - Completely agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeing how I scored at the weekly leaderboard was fun</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I tried to do better than other users on the weekly leaderboard.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


PLATeFORM CONTENT:

44. How often did you use the PROFIT platform during the testing period?

☐ 1 - Less than once a month

☐ 2 - A few times a month

☐ 3 - Once a week

☐ 4 - Several times a week

☐ 5 - Every day

45. Please rate on a scale from 1 to 5 the quality of the following benefits the PROFIT platform seeks to provide:

<table>
<thead>
<tr>
<th>Benefit</th>
<th>1 - Very low</th>
<th>2 - Low</th>
<th>3 - Neither low nor high</th>
<th>4 - High</th>
<th>5 - Very high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial education material</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial forecasting and market sentiment graphs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended content and users</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial literacy test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User Dashboard presenting your impact graph, reputation, user level, etc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Search Functionality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Articles, Polls, Discussions and other posts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
46. If you replied "1" or "2" to the previous question, please briefly explain why:


47. Did you have a positive experience on the use of the chat feature?

Yes ☐
No ☐
## Appendix II: User Groups (from D1.2)

<table>
<thead>
<tr>
<th>(1)</th>
<th>Government executives and political-party members/local authorities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mr. Z is in charge of communicating his party's economic agenda, involving actions that require programme ownership by the wider public, as they are likely to be met with scepticism. He is interested in open-democracy tools that might be conducive to disseminating the necessity of his agenda to the wider public, along with online resources that facilitate the task of communicating economic and financial figures to the wider public.</td>
</tr>
<tr>
<td></td>
<td><strong>Functionalities/benefits:</strong> Understanding public finances, budgeting/investment opportunities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(2)</th>
<th>Professionals in financial services/financial experts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>John recently started his career in a bank and is interested in becoming a personal financial advisor. He is looking for training material for that role, as well as for online resources to refer his customers.</td>
</tr>
<tr>
<td></td>
<td><strong>Functionalities/benefits:</strong> Personal financial planning + tool for explaining financial products/issues to clients</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(3)</th>
<th>Collective investors/borrowers/third sector organisations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Culturion association is a cooperative organisation, whose mission is to promote the local territory in a sustainable way. In the last few years, due to the financial crisis, Culturion has seen its services, as requested by the public and its stakeholders, to decline. The project that it is involved in right now is to renovate and repurpose an old building in the centre of the town square. To this end, Culturion is looking for sustainable financing opportunities.</td>
</tr>
<tr>
<td></td>
<td><strong>Functionalities/benefits:</strong> Financial planning, financing options</td>
</tr>
</tbody>
</table>

| (4) | Customers: Investors/Potential investors/Depositors |
A single woman in her late fifties with no children, Marina just inherited €400,000 from her recently deceased mother. The inheritance is currently invested in 3- to 5-year guaranteed investment certificates with various maturities earning between 2% and 4% located at 4 different banks. Approximately €200,000 is maturing in the next 6 months while the balance is due over the next 24 months. Marina is an office worker for a small family company. She has a flat worth about €175,000 with an outstanding mortgage of €89,000 and she owes €6,000 on a line of credit with a €10,000 limit that she used to buy new furniture. She does not have a company pension but she has retirement savings of €150,000 invested in a number of mutual funds recommended to her over the years by her advisor, Michael, who has his own financial planning office. Like her mother, Marina has always been careful with her money and a diligent saver, but she has been disappointed with how her mutual funds seem to go up and down dramatically. When she last asked Michael about changing her investments, he said there would be a fee to change and besides it was better to be committed “for the long run.” Marina is looking to know more about potential ways to invest her inheritance.

**Functionalities/benefits:**
Information on financial planning, risk and return, risk diversification, understanding investment and the workings of financial markets.

<table>
<thead>
<tr>
<th>(5) Mortgage owners/home owners/first-time buyers</th>
</tr>
</thead>
<tbody>
<tr>
<td>John and Mary are thinking about options to refinance their mortgage, involving plans with fixed or variable interest rates over different time horizons. They are both uncertain about which option suits their personal finances better and involves higher costs and risks.</td>
</tr>
<tr>
<td><strong>Functionalities/benefits:</strong></td>
</tr>
<tr>
<td>Understanding mortgages, understanding investment, understanding insurance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(6) Entrepreneurs/latent entrepreneurs/social entrepreneurs/self-employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>John is 35 years old, married and a father of two. He always wanted to start his own business, open a small coffee shop and bookstore in his neighbourhood. He is currently employed as a librarian in his local library and in the past 10 years he has been seriously thinking about his small-business idea and actively saving for this purpose. He has managed to save an amount of X thousand Euros. John is really worried about the costs of running a small business and does not know much about financing options from taking a loan from a financial institution.</td>
</tr>
<tr>
<td><strong>Functionalities/benefits:</strong></td>
</tr>
<tr>
<td>Information on small-business financing options, tool in support of managing finances</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(7) Active citizens/taxpayers</th>
</tr>
</thead>
</table>
Nick and Marie, a married couple for 12 years and parents of a son, have extremely opposite political views - also based on family backgrounds - on most matters, including the economics agenda. They are both active citizens and have concerns about their home country’s future and intergenerational justice. They have recently been asked to vote on a crucial matter involving two different agendas by two parties, regarding their country’s fiscal and monetary policy choices. Nick and Marie are confused on the assessment of their country’s economic situation and the evaluation of the opposing proposals by the two leading parties regarding expansionary versus contractionary policies, the budget and spending.

**Functionalities/benefits:**
Understanding public finance, responsible investment

### Unemployed/trainees

Mariana is a 54-year-old single woman who has been working at a local semi-private art gallery for 24 years. The gallery has seen a slow, steady decline in sales over the past ten years and now has received notice from the government that all funding will cease within six months. All six employees have been put on notice that the gallery will soon close. Although Mariana has a degree in literature, she has few computer skills. Her job description included selling artwork, using the old cash register, and handling the window displays for the shop. Mariana is overcome with anxiety as she faces the hard truth about her situation. Her salary was only slightly above minimum wage and, as a result, she has very little savings. She has no debt, and her only assets are the furniture in her apartment, plus several pieces of quality artwork. Her main expenses are her downtown apartment that she rents for an amount X per month plus her regular living expenses. She knows she will be eligible for employment insurance, but has been told she will have great difficulty finding employment considering her limited skills coupled with her age. She is afraid of her future and does not feel confident about her ability to retrain.

**Functionalities/benefits:**
Understanding investment, time value of money, risk diversification, behavioural biases, considering self-employment

### Elderly/retirees/pre-retirees

Mark is 62 years old, works as a cleaner, and is reaching retirement age within a few years. Mark is the sole wage earner and household head in a household of 4 and is worried about his family's financial wellbeing after the time of his retirement. He is interested in learning more about his financial specifics and options once he reaches retirement age.

**Functionalities/benefits:**
Information on retirement planning and accounts, insurance

### Migrants/Members of an ethnic minority
Leticia is 32 and has recently moved from country X to country Y. She works in a family restaurant, owned by her cousins who have lived in country Y for a longer number of years. She has brought an amount of money $Z$ with her and has left a family of 4, parents and 2 siblings back to her native country Y. Leticia is unfamiliar with financial services in country X and is worried about the safety of her money. She also wants to send money remittance money back to her family in country Y and so far the options offered to her either formally or informally seem to her far too costly.

**Functionalities/benefits:**
- Information on remittances, financial planning, benefits and trust on formal finance institutions

(11) **Children/Parents of young children**

Tommy is 12 and has recently noticed an increase in his earnings through a summer job and money received from relatives, specifically his grandparents. Tommy's parents are low educated and do not discuss financial matters a lot with him at home. He would also like to hear more about them at school, but this is also not the case. Tommy heard from a teacher that he should not be spending all his stipend and gifts on consumer goods. He would be interested to know about ways in which he can use the money for his future.

**Functionalities/benefits:**
- Information on children savings account, financial planning

(12) **Customers: Indebted/Overindebted households**

A successful career woman and single mother, Angela, age 52, has always lived a little beyond her means. She enjoys wearing the latest fashions, going out on the town and providing well for her two children, now at prestigious universities out of province. It does not matter to her that credit card charges mounted up, that she is able to pay the minimum amounts required and that she has access to an X line of credit that the bank offered her a few years ago for being such a good customer. She owns a flat downtown worth $Z$ with a mortgage of $W$ and she has a small amount of $B$ in savings accounts. Since beginning to pay for her sons' tuition and out-of-province residence costs, she has maxed out her line of credit and has had difficulty paying her credit cards on time. She is considering asking for an increase in her line of credit but is worried that she might be declined. Angela has had a number of not-sufficient funds cheques recently on her bank account and has been late with her mortgage payment two months in a row.

**Functionalities/benefits:**
- Information on financial planning, household finance, interest rates, inflation.
Appendix III: Use Cases (from D1.2)

Use Case 1: Financial Literacy Assessment

Scope: To raise user’s financial awareness by enabling them to assess their financial knowledge and skills gained by interacting with PROFIT.

Motivation: Financial literacy defined as the: “…ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being” (PACFL, 2008), has received a rapidly growing attention in recent years. In a world of constrained resources, their optimal allocation would be of great significance, becoming even more apparent after the inception of the global financial crisis. In that vein, the ability of consumers to make informed financial decisions is critical to developing sound personal finance, which can contribute to increased saving rates, more efficient allocation of financial resources, and greater financial stability. From an institutional perspective, increased financial capability can contribute to client protection and social performance target assessment by financial institutions. From the European Union's viewpoint, it can also be conducive to the enhancement of the European identity, open democracy and active citizenship for informed political awareness. Recent financial literacy rates across countries reveal that although the rates vary widely across European countries there is common evidence that financial illiteracy rates are above the threshold of 35%. This means that at least 1 out of 3 citizens are financial illiterate.

Story: John is 35 years old, married and a father of two. He always wanted to start his own business, open a small coffee shop and bookstore in his neighbourhood. He is currently employed as a librarian in his local library and in the past 10 years he has been seriously thinking about his small-business idea and actively saving for this purpose. He has managed to save an amount of X thousand Euros. John is really worried about the costs of running a small business and does not know much about financing options from taking a loan from a financial institution.

Application/benefits: While visiting the PROFIT platform, John discovered that he had access to various financial-literacy assessment tools. Accordingly, he used these tools in order to assess his financial knowledge and literacy skill levels. This allowed him to become aware of financial topics on which he needs to work in order to make a solid financial plan and to achieve a better understanding of the conditions of the financial products available to him.

Platform functionalities: The PROFIT platform will incorporate both adaptive (where the computer alters the difficulty of questions in response to the user’s answer) and non-adaptive financial literacy assessment tools (online and printed questionnaires) to capture key information about financial behaviours, knowledge and attitudes. In particular, the platform will encompass knowledge-based performance tests and self-assessment criteria in order to uncover the financial-literacy profile of the user. The latter will engage in obtaining user feedback, which will be informed by the joint assessment of relevant behavioural aspects, such as overconfidence and risk-taking.

Use Case 2: Educational Toolkits

Scope: To test the educational toolkits developed within PROFIT.

Motivation: In accordance to the previous case study, the next step is to provide tools through the platform that can address financial illiteracy. Recent academic literature shows that individuals who are more financially literate have been shown to make more economically rational decisions
pertaining to real estate purchases, insurance purchases, investing, saving, tax planning, retirement planning, pension and insurance planning. At the macro level, salient political choices are determined by attitudes towards redistribution, immigration, austerity, as well as the workings of economic partnerships in monetary and fiscal unions etc. Such attitudes are likely to depend upon the understanding of the basics of macroeconomic accounts and public finance.

**Story:** Nick and Marie, a married couple for 12 years and parents of a son, have extremely opposite political views - also based on family backgrounds - on most matters, including the economics agenda. They are both active citizens and have concerns about their home country’s future and intergenerational justice. They have recently been asked to vote on a crucial matter involving two different agendas by two parties, regarding their country’s fiscal and monetary policy choices. Nick and Marie are confused on the assessment of their country’s economic situation and the evaluation of the opposing proposals by the two leading parties regarding expansionary versus contractionary policies, the budget and spending. In a similar story, a successful career woman and single mother, Angela, age 52, has always lived a little beyond her means. She enjoys wearing the latest fashions, going out on the town and providing well for her two children, now at prestigious universities out of province. It does not matter to her that credit card charges mounted up, that she is able to pay the minimum amounts required and that she has access to a X line of credit that the bank offered her a few years ago for being such a good customer. She owns a flat downtown worth Z with a mortgage of W and she has a small amount of B in savings accounts. Since beginning to pay for her sons’ tuition and out-of-province residence costs, she has maxed out her line of credit and has had difficulty paying her credit cards on time. She is considering asking for an increase in her line of credit but is worried that she might be declined. Angela has had a number of not-sufficient funds cheques recently on her bank account and has been late with her mortgage payment two months in a row.

**Application/benefits:** Through the platform Nick, Maria and Angela will be able to get access PROFIT’s newly developed financial education toolkit. By using this toolkit, they will be able to get a better understanding of notions regarding financial planning as well as concepts regarding macro economy. As potential clients of financial institutions, Nick, Maria and Angela will be able to get more sound financial decisions indirectly enhancing their financial stability.

**Platform functionalities:** The PROFIT Platform will provide financial educational material related to microeconomic and macroeconomic concepts. The financial educational toolkit of the platform will be a collection of important financial education information and tools that the users will be able to access as needed based on their performance, requirements and goals. The platform will navigate the user to the educational material according to its financial literacy skill levels and preferences. The educational material will be available to any user regardless of her financial literacy level. Also, the platform will provide links related to financial education toolkits from other sources such as Financial Institutions, Open online courses, financial games and educational platforms.

**Use Case 3: Financial Collective Knowledge**

**Scope:** In this use case, the user will be able to access the financial collective knowledge that resides in the PROFIT platform. Basically access: data, metadata, knowledge graph (KG), analysis.

**Motivation:** The two main components of the PROFIT platform on the abstract level are methods and data. While the methods are rather static component, the data is always evolving, including the news articles crawled regularly and the user input. Moreover, each piece of data features a metadata either attached to it automatically or obtained with the data. Most of the methods, and hence their efficiency, are based on the metadata. Therefore, the user should be able to benefit from accessing the data in a convenient way and from manipulating the metadata part. The platform may also
Deliverable D6.1

Dissemination Level (PU)

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benefit from such a functionality learning from the usage patterns of the user.

The data is stored in the database and can be accessed in the database, however this option has disadvantages: usability, security. Hence we need to have a set of predefined templates for accessing data.

**Story:** A user enters the platform. In the landing page the user gets personalized analytics and recommendations on the data to browse: fresh news, input from other users, educational materials. The user may be interested to read one of the suggested news articles or to find a different news article. During the reading the user may be interested to have some related reference information: related figures, trends, definitions of the concepts that are not clear. After reading the user may benefit from a recommendation about the related resources: other articles, educational resource, related user input. Another scenario is that the user may want to edit the metadata of the article (tags, relations in the article) to improve the data; the user may choose from the predefined vocabulary or add something from his own. Next the user may be interested in the analytics of the article: topics touched in the article, sentiment score, categories.

**Application/benefits:** the user should be able to search the data and obtain analytics (pre-calculated or calculated on the fly) like sentiment score, category, concepts, readability, corresponding topics and news patterns. Recommendations take the user data and the current piece of information into account. All the analytics, recommendations are based on the metadata for the information unit which is in its turn dependent on the KG (concept for annotation are taken from KG). User should be able to: browse, directly or indirectly influence the metadata for a piece of information, directly or indirectly influence the KG. This will lead to the user getting easy-to-access, relevant and bespoke online resources concerning the topics he is most interested in at the moment.

**List of identified Platform functionalities:**

- **Registration & Login mechanism:** users should be able to register including a double-opt-in mechanism (email is sent after registration with an activation link to avoid misuse of registration). The registration form should NOT ask for too many information to avoid frustration and lower the barrier of registration. Activation link guides the user to users profile page in edit mode and asks to provide more profile information (as image, CV, interests, etc.).

- **Guidance mechanism:** Upon registration the user will be provided with illustrative directions as of how she can use the platform and how she can contribute to it and upgrade her level.

- **Management of user profiles:** user can maintain users profile at any time including ‘remove account feature’ that disables the account (to be discussed: and removes all content of this user from the platform).

- **Personalised Dashboard for the PROFIT users:** providing most important content (knowledge objects) personalised to user needs and requirements. E.g. in the form of different widgets showing (not limited to) the most relevant 3-5 objects as: A) relevant news articles B) relevant e-learning objects C) relevant tools & calculators D) other knowledge objects as available and interesting. Furthermore E) relevant users or F) trends etc.
  - Possibly a user can configure such dashboard by showing / hiding widgets and or positioning such widgets on the screen in a specified area.

- **Browse and Search (relevant) content:** via A) search interface and B) visual browser tool (as a smart glossary). This means a user can make use of a faceted search interface and have A) full text search over all content as well as B) drill down mechanism with groups of facets
(=filters as e.g. types of content, content schemes from Taxonomies = topics, date range, etc.). Search results could be stored and / or single results (that are knowledge objects) can be put into the ‘PROFIT BASKET’ (see below) – means bookmarked and thereby saved for later use.

Additionally a visual browser can be provided that allows to browse through the knowledge graph (taxonomy) and for a selected topic (concept) gives the user a button ‘show all content for this topic’ that creates a ‘topic page’ (means dynamically published page that provides ALL content available for this topic). Remark: this feature is the below mentioned ‘Smart Glossary’ feature that can be integrated herein.

- PROFIT News Aggregator: provisioning of search & browse over news archive – similar to the feature of search & browse above but only on top of news articles.

- Show trends (trending topics) over time for PROFIT (can also be personalised – means trends along the user profile / interests / requirements): in a dashboard / widget the user can see trending topics (Taxonomy terms and / or aggregated to top concepts / concept schemes) over time and can e.g. select period of interest (start date – end date). This feature may provide 2 areas: A) trends of overall PROFIT platform and B) trends aligned with the user profile (trends along users interest) – potentially also C) trends per concept scheme (user selects concept schemes and receives a chart with trends from this scheme over time).

- Show trending knowledge objects over time: similar to feature above but showing the trending knowledge objects instead of topics (Taxonomy terms) – these 2 features could also be combined. Here also A) trending k-objects PROFIT overall B) along users personal profile C) per concept scheme. Here also the user views on such knowledge objects should be taken into account for the calculation of a ‘trendy knowledge object’.

- User Tagging of content (additional tagging mechanism by users – contributing additional tags from the Taxonomy – or even free tags – to a knowledge object) to ensure better annotation by user mechanisms.

- User feedback mechanisms: rating and commenting of a PROFIT knowledge object. E.g. rating by a ‘star mechanism (1-5)’ and stars are aggregated and an (weighted) average is calculated and such average is provided to the user in several views of a knowledge object, as search results, if shown in a dashboard, in detail view (in detail view all ratings plus comments can be shown). Commenting should allow users to give a short statement for the knowledge object (remark: if this is implemented a mechanism of quality assurance at least for illegal content etc. should be specified and implemented). Such feature can be similar to these features on e.g. booking.com or amazon.com.

  - This feature should also provide: Reviews of papers from users, experts (suggested) besides a pure rating & commenting feature.

- Directory of financial tools and calculators

- Browse and explore the Taxonomy via Smart Glossary and suggest edits (PROFIT Knowledge Graph): browse through the Taxonomy in the form of a visualisation (visual mapper) and thereby explore the Knowledge Model and learn about the topic. If an interesting topic (concept) is found the user can click a button ‘show topic information’ and receives a page with all available info on that topic from the Knowledge Graph as e.g. title (pref label), synonyms (alt label), description, images (if any), links to other sources (e.g. Wikipedia, etc.), narrower – broader – relations. PLUS: links to the most important knowledge objects of such a selected topic.
• **Analytics for a single piece of content (knowledge object):** beside the content itself the following information can be provided: sentiment, topics (tags e.g. as tag cloud from Knowledge Graph / Taxonomy), relevant additional info (example: article on exchange rates of Euro/USD then show somewhere the time series visualization), use of such knowledge object (how often viewed by users) and rating & commenting by users; related / similar knowledge objects.

• **Save collections of data (suggested feature):** e.g. in the form of a PROFIT basket where a user can put several knowledge objects and then save such ‘PROFIT KNOWLEDGE BASKET’ with: title, date (automatically) and description, author (automatically) and tags from Taxonomy (suggestions can be provided by PowerTagging = semiautomatic tagging). This could also include BOOKMARKING of a single piece of content and adding this to the BASKET (thereby in the basket the user can manage and organise A) single knowledge objects and B) bundles of such knowledge objects).

  - **Potentially:** A) share 1 knowledge object (a bookmark) with one or more specific users (for this users need to be selected from a search and browse interface – the users the knowledge objects should be shared with) and B) share a bundle of knowledge objects with 1 (same mechanism as before) and/or ALL users (if shared with all users the bundle is published and becomes a new knowledge object in the information management system).

• **Share a piece of content (suggested):** see above – already described

• **Get updated on a specific concept/topic/category Monthly/weekly/daily reports (suggested):** similar feature as the personal dashboard described at the very beginning above BUT the automatically suggested / personalised knowledge objects are sent via email alert service (newsletter service) whereby the user can A) refine the topics the user is interested in (means not only full automatically extracted from user profile) and B) user can select the interval when such emails should be sent as e.g. daily, weekly, monthly. The emails provide ALWAYS a link to the full knowledge object in the PROFIT platform to ensure this is working as a push mechanism = means that users content is pushed to users but users are also guided to the information system back again (and thereby create page impressions and explore also other information).

• **Print button for analytics (suggested):** print and / or export etc. feature should be specified throughout the whole platform.

• **Competition:** predict something, try to guess, make a bet.

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**Use Case 4: Incentive Mechanisms and Personalised Recommendations**

**Scope:** To demonstrate the reputation-based incentive mechanism and personalized recommendation system developed within PROFIT.

**Motivation:** Recent advances in the field of Information & Communication Technologies have led to a major increase in the human knowledge capital. A large amount of financial information, is nowadays easily available thanks to the aforementioned technological developments. However, citizens cannot fully grasp and exploit this information to their benefit, due to the documented human cognitive limitations of processing large volumes of information, as well as the widespread financial illiteracy, even in developed countries. Personalised Recommendation Systems could help citizens by pointing them to the financial education and other material that is of interest specifically
to them and catering to their particular needs. On the other hand, Web 2.0 tools and applications, such as blogs, wikis, and media sharing, could give users of various educational levels, e.g. learners, educators, and experts, the opportunity to collaborate, communicate, and take active part in the knowledge creation process. This is also inline by the so-called crowdsourcing (CS), a distributed online process that emerged with the development of Web 2.0 and harnesses the participation of the crowd for the achievement of particular tasks. However, the success of CS platforms is depended upon the users’ continuous participation and engagement, which can be triggered and sustained by appropriate incentive mechanisms. These incentive mechanisms can be categorized into four main categories, consisting of reputation systems, gamification, social incentive mechanisms, and financial & career rewards.

Story: Eliza is a 50 year old single mother from Greece who has been working as a veterinarian in the private sector for most of her adult life. She has two children, a 22 year old daughter who is studying medicine in another city, and a 17 year old son preparing for his graduation exams. Despite having saved some money for emergency situations, Eliza is often anxious about their financial state and worries whether she will be able to support her children financially during their studies, given also the recent economic developments in Greece. Additionally, she also wants to find more information regarding her retirement and her eligibility status.

Eliza uses her cell phone daily to call her friends, clients, and family. She does not have a computer because she did not need it in her job so far. However, her son persuaded her to buy an affordable tablet and he showed her how to use it for Internet browsing and free communication (calls, messaging). Moreover, she became gradually interested in the use of social media as they give her the opportunity to reconnect with old friends and family members in other cities/countries and she also spends some of her free time reading the news online. However, she is quite reluctant in meeting new people online or expressing her views on specific issues.

Application/benefits: Eliza first heard of the PROFIT platform from her son, who stumbled across the PROFIT project on Twitter and was curious to find out more about “Ethical & Alternative” Banking. Upon visiting the web platform the first thing that he noticed was that he could participate in a competition for new users and gain a tablet. Moreover, he found the design of the platform quite appealing and ‘fun’ as he realized immediately that he could gain points for his action on the platform, unlock new levels, and gain badges and special awards. So, he invited his friends/relatives in order to gain bonus points on the platform.

Eliza, on the other hand, was not very interested in participating initially, since she finds discussing with strangers or competing with them online intimidating, given also the fact that she is a basic computer user and her financial knowledge is also limited. However, she realized quickly that the particular platform could help her increase her financial knowledge, and exchange opinions with other users that experience similar situations or maybe even talk to financial experts. The user-friendly design of the platform and the step-by-step instructions helped her make her first post (a question) and receive feedback from other users, both in the public forum and in private messages. She was also informed by a platform message that the more participation she had to the platform, the more accurate personalized recommendations she could receive regarding other users of the platform with similar interests and needs, and financial education and other material of her particular interests and needs. She soon became interested in presenting a good reputation and participating in the platform through various means (e.g. uploading financial articles, rating others’ posts, participating in platform polls, etc.), and she even thinks of inviting her friends and relatives through social media. She was very happy that through the personalised recommendation service she could find other users that share similar interests and could connect with them, follow them and exchange opinions.
Platform functionalities:

**Incentive mechanisms:** The PROFIT platform will incorporate a reputation-based incentive mechanism in order to attract users’ attention and sustain their engagement with the platform. It combines a variety of different incentive mechanisms (reputation system, gamification, social incentive mechanisms, and financial rewards) to appeal to different user motives. More specifically, users can rate, comment and react to the platform’s content as well as content uploaded by other users, and provide relevant feedback, leading to a fruitful exchange of new knowledge in the financial domain. Two distinct reputation metrics are going to be implemented, in order to reflect both the participation level of a user and the quality of her provided contributions on the platform. These reputation metrics will provide feedback to the users as to what extent they are engaged with the intended behaviours.

The incentive mechanism will also incorporate gamification elements (such as points for each contribution on the platform, badges indicating user achievements, illustrated avatars to show the level of the user, etc.), as an additional service layer of the reputation system. Both implicit (e.g. social status) and explicit rewards (e.g. tangible rewards) are combined in a way that could appeal to the various different target users of the PROFIT platform. Moreover, unnecessary competition (e.g. public user leaderboards) will be avoided and users’ privacy concerns will be taken into consideration (e.g. by giving them the opportunity to make their user profiles private).

To promote a sense of ownership and of a common goal among the participants, they will be provided with appropriate and timely feedback regarding the impact of their contributions on the platform (e.g. through interactive visualizations, graphs, etc.). Special feedback will also be provided to newcomers, by giving them simple guidelines on how they can participate, highlight what they can achieve from their participation, and provide them with special rewards for their initial contributions.

Social incentive mechanisms elements that will be incorporated in the platform include functionalities that act as enablers of social interactions (such as the functionality to follow other users or to comment on others’ posts, exchange private messages with other users, share posts on social media, etc.). Lastly, financial incentives to increase the users’ interest include the possibility to enter a competition for a tangible reward (e.g. a laptop), as well as discounts on financial products provided by local cooperatives and alternative banks.

This reputation-based incentive mechanism is described in more detail in Katmada, Satsiou and Kompatsiaris (2016).

**Personalised Recommendation System:** The developed personalized recommendation system will point users to (i) financial content (articles, forecasts, etc.) of their particular interest, (ii) financial educational material of their particular profile, (iii) other users of the platform with similar interests whom with whom he can connect and exchange views. The user can opt also to be pointed to users of similar age, country, or the most reputed users of the platform whom he can follow and be updated on any new contributions they make. The developed system will be based on an advanced collaborative filtering method according to which recommendations are based on the similarity of the user in hand and the other users of the platform calculated based on the contributions the users make in the platform, the ratings they provide to different platform content, etc. Thus the more contributions the user make in the platform, the more accurate personalized recommendations he can receive, acting also as an incentive for him to contribute as much as possible.

**Use Case 5: Market Sentiment-based Financial Forecasting**
Scope: To demonstrate the market sentiment-based financial forecasting tools developed within PROFIT.

Motivation: Financial markets integration and the expansion of electronic trading platforms have increased the number of individual investors engaging in any kind of financial investments. Furthermore, as the costs of entering the stock market have fallen, more and more individuals are investing in equities or other financial instruments. The literature has identified several patterns of investing behaviour regarding the kind of portfolio they choose to hold and how they trade over time. These patterns include insufficient and naïve diversification and excessive trading among others. The most prominent behavioural explanation of such excessive trading is overconfidence: people believe that they have information strong enough to justify a trade, whereas in fact the information is too weak to warrant any action. These patterns are well diversified by the institutional investor behaviour leading to underperformance of the selected portfolio relative to a benchmark or to institutional investors’ investment selections. Moreover, it is recognized by many economists that investors are only partially rational due to their limited processing capacity. Only few traders can pay attention to all sources of information. The increased volume of information in recent years makes it even more difficult for an investor to keep track of the daily developments in the financial markets.

Story: A single woman in her late fifties with no children, Marina just inherited €400,000 from her recently deceased mother. The inheritance is currently invested in 3- to 5-year guaranteed investment certificates with various maturities earning between 2% and 4% located at 4 different banks. Approximately €200,000 is maturing in the next 6 months while the balance is due over the next 24 months. Marina is an office worker for a small family company. She has a flat worth about €175,000 with an outstanding mortgage of €89,000 and she owes €6,000 on a line of credit with a €10,000 limit that she used to buy new furniture. She does not have a company pension but she has retirement savings of €150,000 invested in a number of mutual funds recommended to her over the years by her advisor, Michael, who has his own financial planning office. Like her mother, Marina has always been careful with her money and a diligent saver, but she has been disappointed with how her mutual funds seem to go up and down dramatically. When she asked Michael about changing her investments, he said there would be a fee to change and besides it was better to be committed “for the long run.” Marina is looking to know more about potential ways to invest her inheritance.

Application/benefits: Marina, while visiting the PROFIT platform, discovered that she had access to various financial and econometric tools that could assist her with her investment situation. She used the forecasting tools of the platform as well as the market sentiment indexes that were extracted for various topics such as oil prices, stock markets, exchange rates etc. in order to get a quick report of the trends that prevail in various financial markets. To better refine her investment decisions she also accessed publicly available forecasting data and sentiment indexes from various sources that the platform presented by a topic of interest.

Platform functionalities: The PROFIT platform will incorporate novel financial forecasting tools exploiting the market sentiment (distilled from news, important events, news and users’ polls), for enhancing the awareness, perceptiveness, and meta-knowledge of non-expert and expert users in financial aspects. Via its market sentiment-based financial forecasting tools, the platform will also communicate and disseminate financial trends to the user and will provide her with a methodology to better understand how financial markets operate and interact with each other giving practical examples of what is meant by “for the long run”. Finally, the platform will incorporate interactive time series visualisations and reports. These graphs and reports will provide the user with the means to get a self-evaluation of her predictive performance based on realised events that take place in financial markets.