Grid enabled access to rich media content

Building and Operating the GREDIA Banking Pilot Application

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1. Banking Pilot Application Overview

In the context of the GREDIA project and in order to assess the effectiveness of the GREDIA platform in real life, a banking application has been developed, which enables the exchange of private information between banking organisations and their potential customers for the assessment of their creditability and the risk associated with granting a specific loan according to the Basel II regulations. This pilot utilises the advances in web services and other middleware developed in GREDIA in order to demonstrate how Grids can be accessed by many partners regardless of location, ensuring that the data sharing is consistent with the principles of the financial sector.

1.1. Pilot Objectives

The GREDIA banking pilot application aims to meet the following objectives:

From a strategic point of view

- Assist in strengthening the bank's position to efficiently respond to customers' needs and address challenges in a competitive environment
- Expand the portfolio of synergies with other trusted sources, such as banks and external information providers
- Evaluate the advantages to innovative approaches for new and flexible business models, in which a governmental institute or organisation controls the bank system within a country and consequently has access to all the subscribed banks, in order to provide with the appropriate creditability of their investments (including loan applications and sharing)

From a business perspective

- Enable bank's boosting productivity by reducing the cost for creating and performing dynamic business processes
- Overcome the limitations of the bank's legacy sealed and monolithic systems
- Increase the opportunities for market penetration and bank customers' portfolio
- Ensure the secure (at all levels) exchange of critical distributed data

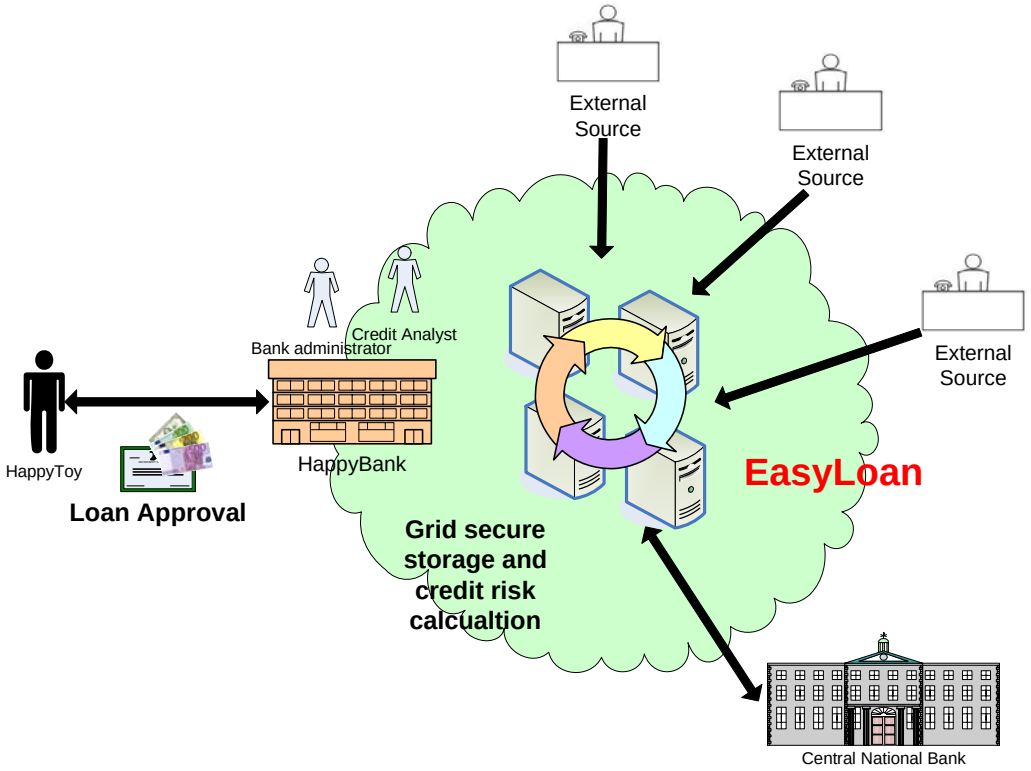
From a technical point of view

- Support the massive access to the bank's services for requesting loan applications
- Parallelise the process for credit scoring to speed up relevant calculations
- "Gridify" the ratios used in credit scoring calculation formed on the base of the history of each bank account movements
- Increase the virtual work space by enabling more trusted sources to provide data in order to enable the more accurate evaluation of the relevant credit merit
- Support the updates for customers' credit scoring

1.2. Pilot Scenarios Overview

The GREDIA banking pilot application deals with servicing multiple concurrent loan application requests and offers the realization of a Grid-based 'virtual work space' enabling for the exchange of complex information, between the customers and their bank(s), in a Basel II related credit scoring scenario. The process of calculating the customer credit line becomes accurate as much information from different sources is made available to the bank. Towards this direction, the banking pilot application serves as the base for supporting the various actors being involved to effectively cooperate and provide the most relevant and reliable decisions.

A graphical representation of the banking pilot application concept is depicted in the following figure:



The GREDIA banking pilot application provides a Web-based solution for enabling the customer companies to submit a loan request and give to the bank as much information is possible so that the credit score is affordable and precise and the bank can take better decisions in the evaluation (and probably tailor a better price for the customer). The bank representatives can process the loan applications by combining data coming from a lot of different information sources. Through this application, the banking market can maintain a collaborative space, where customer companies and individuals can interact with their banks and securely exchange qualitative and quantitative data autonomously.

The large volumes of data that an organization with hundreds of thousands of clients produces daily require a robust, efficient and versatile system for their storage and retrieval. Banks store and utilize large and highly diverse amounts of data that are both human and computer generated. Pertaining to this scenario, banks utilize information that is: internal (i.e., records, assets, ratings, etc that the bank already holds but may be geographically distributed); external (i.e., useful information on a client's economic reliability or potential as this is documented from external sources such as the Risk Department of the Italian Central Bank); and finally, user-provided (i.e., the data that the client him/herself provides during the application or later processes).

Through the Web-based solution of the GREDIA Platform, the banking pilot application integrates all the available data, which can be efficiently stored, indexed and retrieved. Thus, all relevant documents are secured stored in Grid infrastructure and indexed according to the customer's ID, date, etc**.** In order for the credit scoring algorithm to be applied, a number of different documents and data need to be collected, by performing multiple queries, based on different attributes. Finally, having collected all the required/available data, the system identifies the service that implements the actual score computation.

The banking pilot application has foreseen also for including mobile extensions to the credit scoring process. In that respect, a bank representative can visit the premises of the customer company, which has applied for a loan, and use the mobile device in order to securely access the bank system and update data on the company's profile, which can affect the calculation of the credit scoring model, and trigger the recalculation of the credit scoring.

Through this scenario, the workflow in the banking market can be enhanced, since:

- This pilot utilises the GREDIA advances to demonstrate how disparate data, both within an organisation and across several organisations, stored in multiple technologies, can be intelligently viewed in a Grid environment to support a decision process
- The collaborating actors can define strict contract statements, configuring the security layer so that, during communication and data exchange between parties, the security can be guaranteed on a very fine grained level
- New business scenarios can be implemented, which provide added-value to the bank market portfolio, and enable the deployment of fruitful collaborations to establish mutual massive annotated data access and retrieval
- The internal processes can be optimised in terms of execution time and information value, as complex computations for the credit scoring evaluations can be parallelised and self-repaired, through service replacement in case of malfunction or unavailability

2. Pilot Manuals

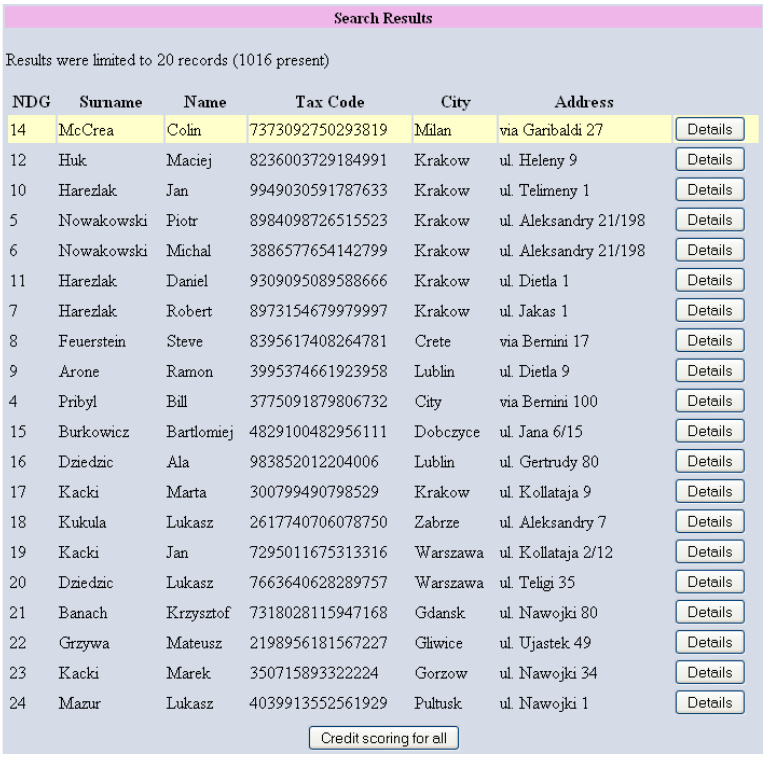
2.1. Building the Pilot

2.1.1. Running the Application Scenario

In order to be able to interface with the banking pilot application (and any APPEA application scenario), the following conditions need to be met:

- The user must have an operational Web browser with javascript supports and cookies turned on.
- The user must be registered with the FiVO framework as a member of a relevant Virtual Organization (this can be done by contacting bkryza@agh.edu.pl).

Once these steps are complete, the user may log into the GREDIA portal and execute any application scenarios available to him/her, including the banking pilots.



Search Results

Results were limited to 20 records (1016 present)

NDG	Surname	Name	Tax Code	City	Address	
14	McCrea	Colin	7373092750293819	Milan	via Garibaldi 27	Details
12	Huk	Maciej	8236003729184991	Krakow	ul. Heleny 9	Details
10	Harezlak	Jan	9949030591787633	Krakow	ul. Telimeny 1	Details
5	Nowakowski	Piotr	8984098726515523	Krakow	ul. Aleksandry 21/198	Details
6	Nowakowski	Michal	3886577654142799	Krakow	ul. Aleksandry 21/198	Details
11	Harezlak	Daniel	9309095089588666	Krakow	ul. Dietla 1	Details
7	Harezlak	Robert	8973154679979997	Krakow	ul. Jakas 1	Details
8	Feuerstein	Steve	8395617408264781	Crete	via Bernini 17	Details
9	Arone	Ramon	3995374661923958	Lublin	ul. Dietla 9	Details
4	Pribyl	Bill	3775091879806732	City	via Bernini 100	Details
15	Burkowicz	Bartlomiej	4829100482956111	Dobczyce	ul. Jana 6/15	Details
16	Dziedzic	Ala	983852012204006	Lublin	ul. Gertrudy 80	Details
17	Kacki	Marta	300799490798529	Krakow	ul. Kollataja 9	Details
18	Kukula	Lukasz	2617740706078750	Zabrze	ul. Aleksandry 7	Details
19	Kacki	Jan	7295011675313316	Warszawa	ul. Kollataja 2/12	Details
20	Dziedzic	Lukasz	7663640628289757	Warszawa	ul. Teligi 35	Details
21	Banach	Krzysztof	7318028115947168	Gdansk	ul. Nawojki 80	Details
22	Grzywa	Mateusz	2198956181567227	Gliwice	ul. Ujastek 49	Details
23	Kacki	Marek	350715893322224	Gorzow	ul. Nawojki 34	Details
24	Mazur	Lukasz	4039913552561929	Pultusk	ul. Nawojki 1	Details

Credit scoring for all

Figure 1: Executing APPEA prepared application scenarios using a Web portal

2.1.2. Modifying and Committing the Application Scenario

If the user wishes to modify the application scenario or deploy new application scenarios, then he/she must set up the Application Execution Planning Tool, which is available for download from the http://gredia.cyfronet.pl website. The AEPT is based on the Eclipse framework and requires the user to have an operational version of the Java Development Toolkit 1.6.0_10 (or later). Specific manuals are provided on the http://gredia.cyfronet.pl website (please consult the Installation section). AEPT is available both for Linux and Windows systems.

If the user wishes to execute application scenarios locally, a GSEngine server package needs to be downloaded and installed. This package is also available at gredia.cyfronet.pl. Otherwise, a GSEngine client needs to be installed and connected to a running instance of the remote Execution Service, such as those deployed on virolab.cyfronet.pl and gredia.cyfronet.pl (port 6900). The AEPT includes a user-friendly wizard devoted to configuring the GSEngine software.

Once the AEPT is configured, the user may log into the system using his/her FiVO handle (same as for end users) and check out any scenario from the GREDIA scenario repository, which is located at http://gredia.cyfronet.pl/trac/gredia/wiki/installation. Upon checkout, the application scenario script can be modified and new files attached as required. The overall sequence of actions is as follows:

- Start AEPT
- Log in using your FiVO credentials
- Click the "Check out Application Scenario" button and import the selected scenario into your local workspace
- Introduce any modifications you wish
- Commit the scenario by right-clicking its name and selecting Team > Commit.
- Optionally, you may also release the scenario for execution by the Portal by right-clicking the scenario name and selecting Team > New Release.

The same procedure applies to any other application scenario. If the user wishes to create a new scenario, he/she should click the "New Application Scenario" button. A new scenario can be committed to the Application Scenario Repository by right-clicking its name and selecting Team > Share Project.

2.2. Pilot Functionality

This section provides the "getting started guide" for the banking pilot application.

1. Access the Application

Connect to http://hestia.atc.gr/gredia. You will be redirected to the portal location. You may want to bookmark this address.

2. Login

In order to log in, write your username and password. Make sure that you select the EasyLoan VO.

Figure 2: Login Screen

3. Create Customer Profile

This form is used to insert a new customer into the banking data repository. The form requests customer details and then stores the data in the secure database at POPSO. This action should be run by a bank clerk on behalf of the client.

Please note that some fields require certain types of input. For instance, the tax code should be a 16-digit number. Relevant information is provided in the form of tooltips in the scenario form.

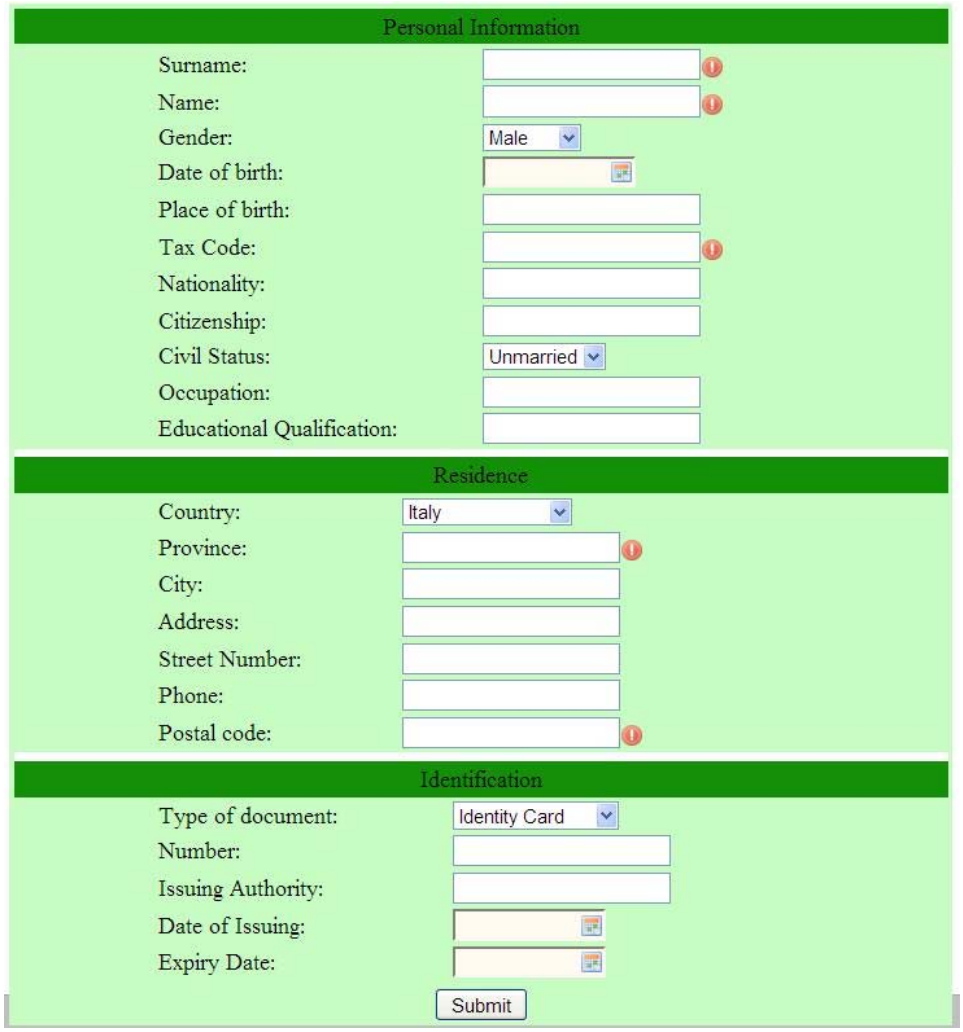


Figure 3: Customer Profile Form

4. Customer Selection

This is the main scenario of the GREDIA banking application. It is used to determine customer credit profiles and calculate the probability of credit default for selected subsets of customers.

The scenario begins with a form where the banking representative can enter search criteria, enabling the system to narrow down the set of customers to be considered for credit assessment. Once the relevant criteria are entered, the scenario queries the secure database at POPSO and retrieves a list of customers.

Figure 4: Searching a bank customer form

The banking representative can then perform the following operations:

- Request details for a given bank customer,
- Enter the credit profile for a given customer (income and expenditure values),
- Calculate credit scoring for a given customer,
- Calculate credit scoring for all customers retrieved in the first step of the application scenario.

The credit profile scenario is parallelized: if the banking representative decides to estimate credit scoring for all registered customers, the Appea platform will utilize a number of separate credit profile assessment services deployed on various servers in the GREDIA infrastructure. This has the benefit of significantly speeding up the calculations, as shown in the summary form displayed once the credit scoring calculation concludes.