



 Infinitech

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The INFINITECH Marketplace

Empowering the Digital Finance Community
through a unique Repository of Big Data and
Artificial Intelligence Resources

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1. Introduction

1.1 The rise of Big Data and AI in Finance

In recent years, financial and insurance organizations are producing large volumes of digital data from a variety of sources including traditional enterprise systems, e-banking and mobile-banking transaction processing systems, social media platforms, as well as emerging blockchain systems based on distributed ledger technologies. The availability of these data has given rise to the development and deployment of a host of novel banking, finance and insurance applications in areas such as credit scoring, customer risk assessment, personal finance management, asset management, robot-advisors, fraud detection, customer centric analytics, intelligent customer service and regulatory reporting. Most of these applications rely on big data and Artificial Intelligence (AI) technologies, which enable the persistence, the management and the intelligent analysis of these datasets.

AI applications in financial and insurance are already delivering a positive Return on Investment (ROI) for financial organizations. This ROI stems from¹:

Tangible improvements in the efficiency of existing digital finance business processes (e.g., risk assessment, regulatory reporting), which enhance productivity and drives reductions in operational costs. Therefore, these improvements increase the profitability of finance and insurance organizations.

The development of novel personalized customer-centric products that increase the customers' engagement with the organization and their overall lifetime value for the financial or insurance company.

This is the reason why there is a surge of market interest on AI applications in digital finance and insurance. According to Grandview research, the global AI in Fintech (Financial Technology) market was valued at USD 9.45 billion in 2021 and is expected to grow at a Compound Annual Growth Rate (CAGR) of 16.5% in the period from 2022 to 2030². This growing market value will be produced in the scope of growing ecosystem that comprises multiple stakeholders, including traditional banks and insurance firms, emerging Fintech and Insurtech companies, digital finance/insurance vendors and integrators, as well as consultants and regulators.

To accelerate the adoption and deployment of Big Data and AI solutions for digital finance, all stakeholders need easy access to a variety of technical and technological resources. The latter range from data infrastructure components and Machine Learning (ML) algorithms to training and learning resources. Along with access to these resources, most stakeholders need also support in development, deployment and innovation management processes, notably support that will help them learn, gain experience and gradually overcome development and deployment barriers. Nevertheless, most of the resources that are nowadays available to financial organizations, insurance companies and other relevant

¹ OECD (2021), Artificial Intelligence, Machine Learning and Big Data in Finance: Opportunities, Challenges, and Implications for Policy Makers, <https://www.oecd.org/finance/artificial-intelligence-machine-learningbig-data-in-finance.htm>.

² <https://www.grandviewresearch.com/industry-analysis/artificial-intelligence-in-fintech-market-report>

stakeholders tend to be fragmented and propriety rather than structured, integrated, and openly accessible from a single-entry point. This can become a serious setback to testing AI solutions and deploying relevant AI-based innovations.

1.2 Catalogues and Repositories of Resources for AI in Digital Finance in Europe

To address the need for accessing Artificial Intelligence and Digital Finance related resources from a single-entry point, several European Research and Innovation (R&I) projects have developed on-line catalogues and repositories of such resources. Some of the most prominent examples of catalogues and repositories with relevance to the digital finance sector include:

The AI4EU Catalogue of AI resources. AI4EU is the first European Artificial Intelligence On-Demand Platform and Ecosystem, which has been recently built with the support of the European Commission under the H2020 R&I program. AI4EU has developed a searchable catalogue of AI assets, which includes already 100s of AI resources. These resources are classified based on different criteria, including the business domain they address. Nevertheless, the catalogue does not include any resources in the digital finance and insurance category. Moreover, even though some of the AI resources of the catalogue have been used in finance use cases, the catalogue is far from providing a critical mass of digital finance resources that could be useful for the BigData and AI in finance and insurance communities.

The Internet of Things (IoT) Catalogue is a one-stop-source for IoT knowledge, innovations and technologies. It aims at helping IoT stakeholders (e.g., developers, integrators, advisors, end-users, etc.) to access IoT resources and use them to improve the competitiveness and business results of their organizations. The catalogue comprises use cases, technologies, components and other IoT-related resources, which in several cases include analytics, ML and AI algorithms. Several EU projects have leveraged the IoT catalogue infrastructure in order to provide repositories of components in the form of new segments of the catalogue. However, the catalogue is not primarily focused on AI and does not include digital finance resources.

The Finsecurity portal is an on-line catalogue and community of security experts and stakeholders of the finance sector, which was created by the **H2020 FINSEC project**. It presents, promotes and offers solutions and services for the security of the critical infrastructures of the Finance Sector. Hence, while being focused on the digital finance sector, its scope is quite limited to security and critical infrastructure protection and does not cover the broader scope of AI-based Fintech and Insurtech applications.

Beyond these EU projects initiatives, there are also commercial initiatives and open-source ecosystems that provide single-entry point access to AI resources. Two of the most prominent examples include:

The KNIME Hub offers public and private spaces for organizing and sharing AI/ML resources developed in the scope of the ecosystems of the **KNIME platform** for data science. It includes many solutions, yet very few of them are directly related to finance sector use cases.

The Acumos AI platform which is an open source framework that eases the development, and sharing of AI applications. Acumos had started a marketplace of standardized AI solutions, which did not however created a lot of traction around the platform.

There are many other initiatives that have developed similar repositories of solutions, while a lot of code for software solutions can be found in lower level repositories such as github. However, there is generally a lack of single access points to a critical mass of AI/ML based solutions for digital finance and insurance. Motivated by this gap, the H2020 INFINITECH project has developed and established the INFINITECH marketplace, an on-line repository of AI-based solutions for digital finance.

2. The INFINITECH Marketplace

2.1 Overview

The INFINITECH marketplace is a repository and a catalogue of on-line resources about Big Data and AI solutions in digital finance and insurance, which has been established by the H2020 INFINITECH project. It supports the innovation efforts of the INFINITECH community and of other EU projects, including the efforts of banks, insurance companies, Fintechs, Insurtechs, AI/BigData vendors, as well as of universities and research organizations. The marketplace is already used by the INFINITECH partners and other related organizations from their business networks, including other EU projects (e.g., H2020 Triple-A), researchers, banks and digital finance innovation associations.

The marketplace is on-line accessible at: <https://marketplace.infinitech-h2020.eu/>. Its home page is depicted in Figure 1. As evident from the home page, as of September 2022, the marketplace comprises:

- 41 technical assets for AI and Big Data in digital finance that were developed by the INFINITECH project.
- 75 third party technical assets and tools for AI and Big Data in digital finance, including solutions developed by the INFINITECH business partners and other third parties organizations.
- 212 courses and 77 innovation services (including resources developed in INFINITECH), structured and organized in searchable catalogues.
- 14 workshops and 4 thematic Webinars addressing many different technical and technological areas of AI/BigData solutions for digital finance and insurance.

The contents of the marketplace form already a critical mass of technical, training and innovation support resources, which can be of interest to various stakeholders. Furthermore, the amount of resources that are integrated in the INFINITECH marketplace is constantly growing in an attempt to keep up with the evolution of the state of the art and to continually provide value to the community.

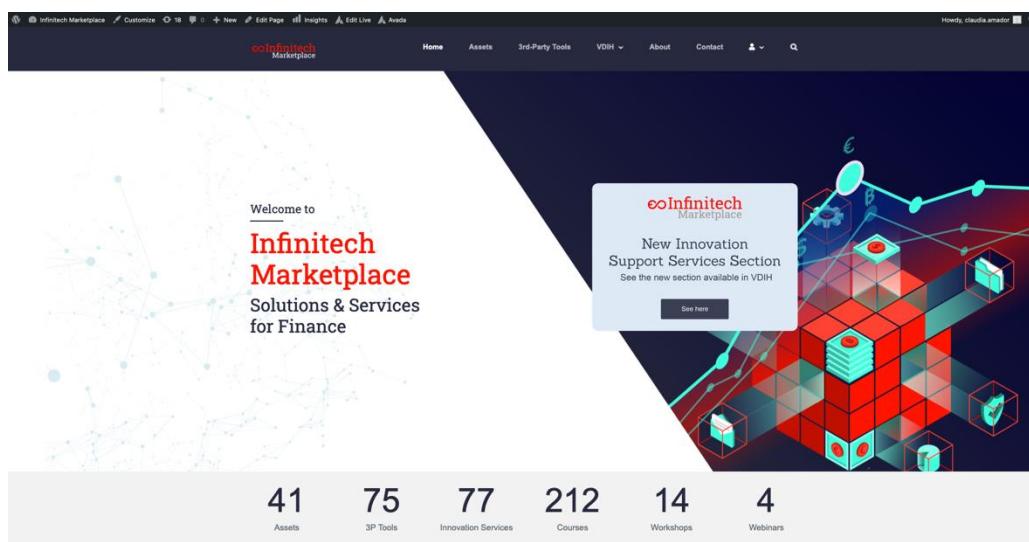


Figure 1 - The INFINITECH Marketplace (<https://marketplace.infinitech-h2020.eu/>)

2.2 Technical Architecture

From a technical viewpoint, the marketplace is empowered by a platform that follows the architecture presented in Figure 2. At a high level, the platform comprises the following layered structure:

- **A presentation layer**, which visualizes the marketplaces contents to different stakeholders of the INFINITECH community. These stakeholders are of two types, namely providers and consumers of marketplace resources. Hence, this layer includes the front-end of the platform, which is the single point of access to the resources and capabilities of the marketplace.
- **An interaction layer**, which empowers the interaction of the front-end elements and controls with the marketplace by means of properly designed APIs (Application Programming Interfaces). In addition to APIs for accessing, storing, persisting, and visualizing resources, the interaction layer provides APIs for access to lower-level run-time environments (i.e., Sandboxes and the ALIDA platform³) where selected INFINITECH resources are executed. Specifically, these environments enable the on-line execution of services, which goes one step deeper than mere access to information about assets and services.
- **An assets management layer**, which provides functionalities for managing assets' data and metadata within the INFINITECH marketplace. Management functions include searching for an asset (or resources), as well as CRUD (Create, Retrieve, Update, Delete) functionalities.
- **An assets storage layer**, where the various resources are persisted in the databases of the platform, including SQL and noSQL databases.

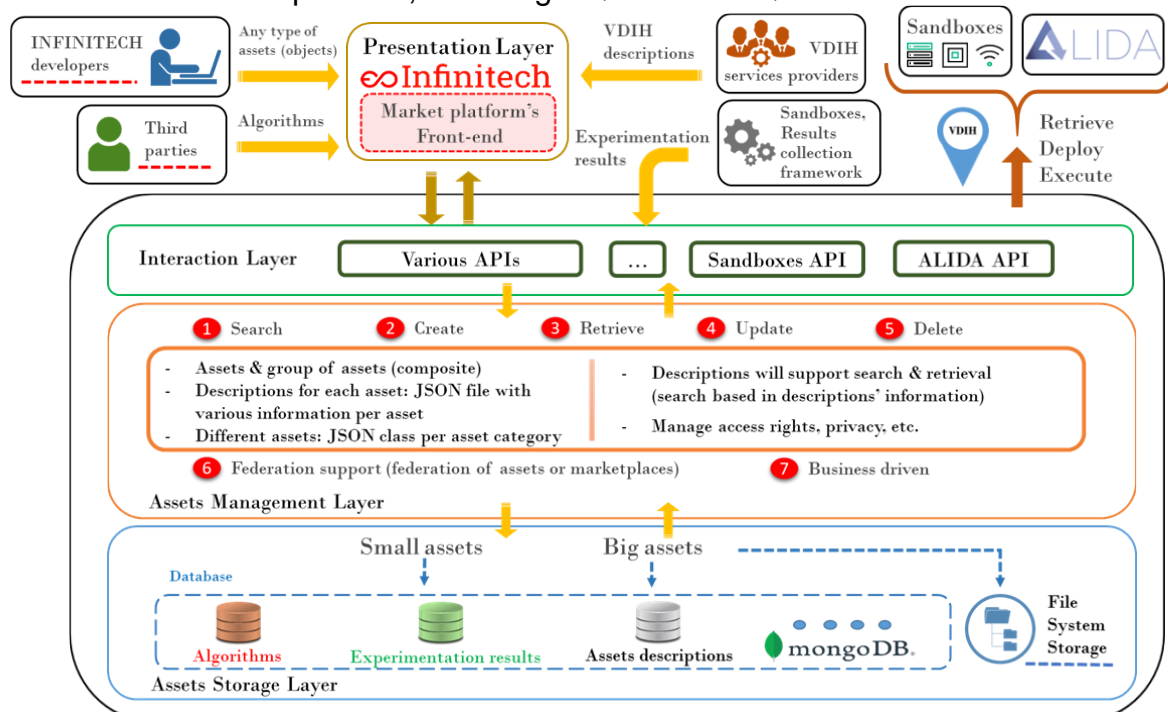


Figure 2 - INFINITECH Platform Architecture (<https://marketplace.infinitech-h2020.eu/>)

³ "ALIDA: improving flexibility and business responsiveness", available at: <https://www.eng.it/en/case-studies/alida-per-migliorare-la-flessibilita-reattivita-del-business>

Overall, the INFINITECH marketplace platform comprises back-end and front-end components, while realizing a unified and integrated environment for managing resources/assets of varying types and formats.

2.3 Technological Assets and Tools

The technological assets and tools of the marketplace are of different types and are offered based on different formats. They include:

- Datasets for data science testing and experimentation.
- Software components in terms of docker images for easy packaging and distribution.
- Source software libraries and applications available in Github.
- Data science components (including machine learning code) in the form of data science notebooks (e.g., Jupyter Notebooks).
- Open-source components with links to software repositories.
- Textual and multimedia documentation of software components and solutions, including PDF documents and Youtube videos.

From a business perspective the various assets and tools cover many data intensive digital finance use cases, including risk assessments of investment portfolios, customer profiling solutions, financial recommendation solutions, usage based insurance solutions, energy efficient and ESG investments, regulatory compliance and data protection solutions, as well as a variety of blockchain solutions. INFINITECH's ambition is to populate the marketplace with Big Data & AI assets and resources spanning the entire digital finance sector.

2.4 Resources and Services

The marketplace integrates a rich set of training and innovation management resources and services, including:

- **A searchable catalogue of training resources for AI and Big Data in Digital Finance.** including courses in major training platforms like Udemy and Coursera, course and trainings developed by INFINITECH, as well as a rich set of relevant webinars that were organized by INFINITECH project and organizations of the INFINITECH partners' business network. Moreover, the catalogue includes training resources in the form of how-to videos, which drive their viewers to complete a concrete programming or data science task.
- **A searchable catalogue of accelerator programs for AI/BigData and financial technology in Europe.** The catalogue provides comprehensive information about each program, including its technology or business focus, as well as the location where the acceleration services are provided.

These resources complement the assets and tools of the marketplace. They are destined to help potential users of the marketplace's assets and tools to develop the skills and obtain the innovation support needed to use and fully leverage the available technical and technological resources of the repository.

2.5 Virtualized Digital Innovation Hub

The marketplace includes a dedicated section that comprises innovation management and support services. This section is conveniently called Virtualized Digital Innovation Hub and comprises the following services and resources:

- **The training and accelerator’s catalogues of the marketplace.** These catalogues enable innovators to locate and access skills resources and innovation support services through a single-entry point.
- **The INFINITECH innovation support service.** This service provides Fintechs, SMEs and innovators working on novel ideas with access to information and resources about these ideas, notably resources available within the INFINITECH marketplace repository or linked to it. An overview of the service operation with emphasis on its innovation support workflow for SMEs is illustrated in Figure 3.
- **The INFINITECH digital finance skills framework.** The framework provides a structured taxonomy of skills for digital finance, along with guidelines for building skills profiles based on them. It can be used by Fintechs, banks and policy makers in their skills development and training program development activities.

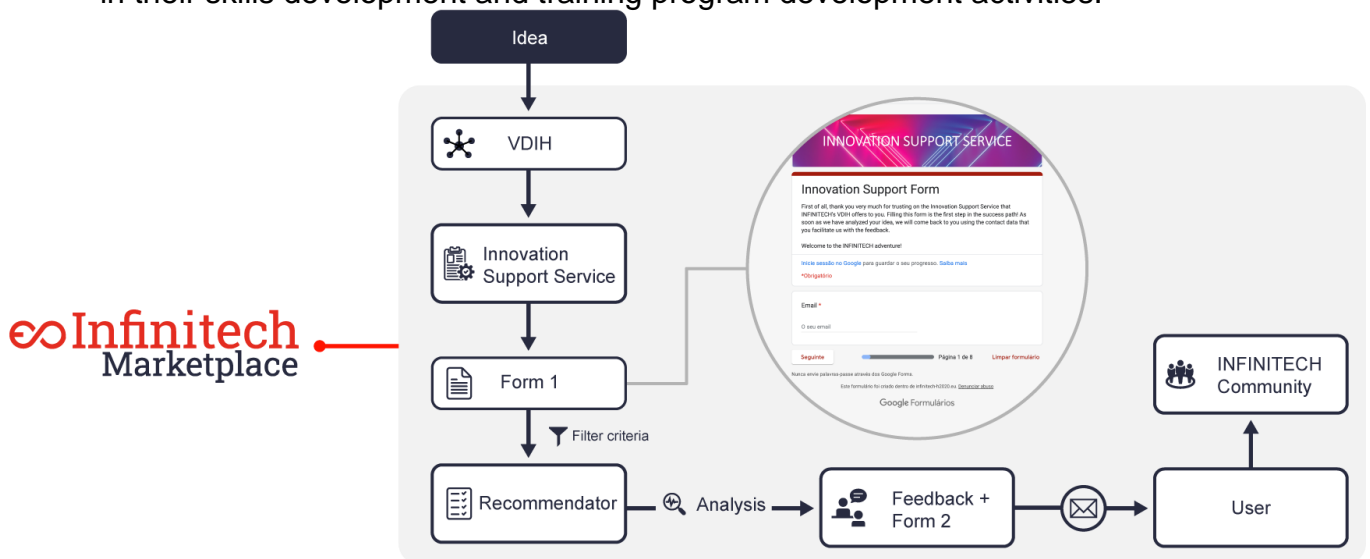


Figure 3 - INFINITECH Innovation Support Service

3. Using the INFINITECH Marketplace

3.1 Target Stakeholders

The assets, resources, and services of the INFINITECH marketplace address the needs of a wide range of stakeholders of the digital finance and insurance industry, including:

- Fintech and Insurtech enterprises seeking to innovate based on Big Data and AI in the finance and insurance sectors respectively. The INFINITECH marketplace provides to these enterprises with access to training and innovation support resources. In addition to supporting Fintechs and Insurtech enterprises as consumers of INFINITECH resources, the marketplace can support them as providers of novel solutions.
- Researchers in AI and/or digital finance, which are provided with resources (e.g., software, datasets, training courses) for developing research solutions and improving their skills. Furthermore, researchers and scientists are provided with opportunities to share their research and innovation outcomes through the marketplace i.e., to promote their solutions to the INFINITECH community.
- Vendors and integrators of digital finance and insurance solutions, which will be provided with examples of practical solutions that could help them in designing, developing, and deploying their own products and services. Moreover, the marketplace serves as a promotional channel for vendors that have already developed relevant solutions, as these solutions can be integrated and advertised through the marketplace.
- Banks and insurance enterprises that are provided with sample solutions, practical demonstrators and learning resources that can help them prepare for their digital transformation journeys.

3.2 Functionalities and User Journeys

To access the marketplace's resources and services, interested stakeholders must register to the platform. Registration is generally simple as it can be performed based on existing identify management services (e.g., a Google, LinkedIn or Github account). Register users can access the assets and resources of the marketplace, including for example source code, docker images, technical documentation and trainings. Typical user journeys include for example searching and accessing training courses, searching and accessing accelerator programs, obtaining information for an innovative idea through the innovation support service, accessing and downloading technical resources and tools, viewing some webinar, accessing training materials and more.

The marketplace enables also resource providers to add new assets to the marketplace. In this direction, it also provides a short video tutorial about adding new assets.

3.3 How to get Started

Register to the marketplace at: <https://marketplace.infinitech-h2020.eu/login>

Browse through assets at: <https://marketplace.infinitech-h2020.eu/assets> and download the asset of your interest.

Access INFINITECH trainings, how-to-videos and other training resources through the training catalogue at: <https://marketplace.infinitech-h2020.eu/vdih/training/courses>

Add a new asset after viewing a short tutorial on how to add your own resource to the marketplace at: <https://marketplace.infinitech-h2020.eu/new-information/new-asset>

4. Complementary Resources & More Information

Stay up to date about the INFINITECH marketplace solutions, assets and services through:

- Visiting the INFINITECH project web site: <https://www.infinitech-h2020.eu/>
- Subscribing to the INFINITECH YouTube Channel:
<https://www.youtube.com/channel/UCIVeOyQyljdCpL51GSPa7Zg>
- Subscribe to the INFINITECH Newsletter at: <https://www.infinitech-h2020.eu/contact-us>
- Registering to INFINITECH Marketplace: <https://marketplace.infinitech-h2020.eu/>

For more information and queries about the INFINITECH marketplace contact us at:

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or

use the contact form at: <https://www.infinitech-h2020.eu/contact-us>