


Tailored IoT & BigData Sandboxes and Testbeds for Smart, Autonomous and Personalized Services in the European Finance and Insurance Services Ecosystem



D7.21-Pilots' Evaluation and Stakeholders' Feedback – II

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Executive Summary

The document D7.21 (Pilots' Evaluation and Stakeholders' Feedback – II) revolves around the collection and the evaluation of the stakeholders' feedback, which represent an important milestone of the periodic evaluation, whose inception is concomitant to the kick-off of T7.8's 2nd phase.

The deliverable contains the business-wise Pilot's monitoring approach that enabled the aggregation, and the consequent evaluation of the stakeholders' feedback, which lead to the identification of improvements as well as to picture the evolution of the INFINITECH project (e.g., trends, development statuses, etc.).

The evaluation herein presented has been carried out from two different standpoints: from the Pilot-specific and aggregated perspective. In particular, the ABI Lab Consortium leveraged the outcomes of the stakeholders' workshops, from which it has been possible to gain an overall view of the Pilots' results and developments. Such a reporting is meant to achieve a straightforward overview of all the Pilot systems regarding their status with respect to the INFINITECH innovation pentagon's dimensions, KPI measurements and lessons learned.

Moreover, the ABI Lab Consortium leveraged the aggregation of Pilots into clusters – according to different categories with respect to the “business types” and “technological areas” – as to observe the stakeholders' satisfactions under different standpoints.

Overall, both the Pilot-specific and Collective evaluation outlines that the Pilots solutions live up to the stakeholders' expectations, if not beyond, over the identified INFINITECH innovation pentagon's dimensions.

Below we report the key characteristics of each Pilot, highlighting the elements that drive innovation:

- Pilot #2 – *Real-time risk assessment in Investment Banking*: ability to promote a risk-driven approach, enabling to adjust portfolio composition if needed.
- Pilot #3 – *Collaborative Customer-centric Data Analytics for Financial Services*: ability to involve multiple stakeholders in developing advanced analytics services, also ensuring continuous compliance;
- Pilot #4 – *Personalized Portfolio Management (“Why Private Banking cannot be for everyone?”)*: high scalability and service orientation in supporting private banking development;
- Pilot #5b – *Business Financial Management (BFM) tools delivering a Smart Business Advise*: tailored approach and simplified user experience in accessing the services in Business Financial Management (BFM) environment;
- Pilot #6 – *Personalized Closed-Loop Investment Portfolio Management for Retail Customers*: focus on business KPIs and on data visualization capabilities for Portfolio Management services;
- Pilot #7 – *Avoiding Financial Crime*: focused on business scenario to design the solution that may have in reducing false positives in fraud detection process, also increasing the efficiency in “express loans” fraud detection;
- Pilot #8 – *Platform for Anti Money Laundering Supervision (PAMLS)*: adopting a mixture of innovative use of Data Science approaches and technology already proven in similar domains, to support the AML process;
- Pilot #9 – *Analyzing Blockchain Transaction Graphs for Fraudulent Activities*: ability to follow a fast-paced innovation thread like blockchain with a dynamic approach to monitoring and analysis;
- Pilot #10 – *Real-time cybersecurity analytics on Financial Transactions' BigData*: focus on scalability of the cloud-based technological infrastructure, supporting Data Science advanced frameworks for real-time cybersecurity analytics;

- Pilot #11 – *Personalized insurance products based on IoT connected vehicles*: data-driven approach both combining structured and unstructured-information (both internal and external) to enhance the analytical capabilities for insurance services, with main focus on IoT;
- Pilot #12 – *Real World Data for Novel Health-Insurance products*: strong in combining data from different domains to promote a tailored approach in the health insurance service;
- Pilot #13 – *Alternative/automated insurance risk selection - product recommendation for SME*: strong business driven approach in supporting SMEs to achieve a better service regarding insurance risk selection, pointing a significant impact on process automation and service delivery;
- Pilot #14 – *Big Data and IoT for the Agricultural Insurance Industry*: close to Agricultural's industry core issues, combining portfolio administration and external weather and climatic analytic monitoring in one all-encompassing application, for an innovative agricultural insurance service;
- Pilot #15 – *Open Inter-banking Pilot*: collaborative approach and focus on research and experimentation to design a brand-new approach in document analysis for banks with the ambition of modeling the Bank Specific language with the support of NLP frameworks;
- Pilot #16 – *Data Analytics Platform to detect payments anomalies linked to money laundering events*: focus on the use of innovative data-driven technologies and approaches to fastening and enhancing AML activity recognitions.

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Abbreviations

AI	Artificial Intelligence
AIGO	AI-based Genetic Portfolio Optimization
AML	Anti Money Laundering
API	Application Programming Interface
ARIMA	AutoRegressive Integrated Moving Average
AgI	Agricultural Insurance
BFM	Business Financial Management
BOC	Bank of Cyprus
BOI	Bank of Ireland
BOS	Bank of Slovenia
BPFI	Banks and Payments Federation Ireland
CBDC	Central Bank Digital Currencies
EBA	European Banking Authority
EoD	End of Day
ES	Expected Shortfall
EU	European Union
FATF	Financial Action Task Force's
FIU	Financial Investigation Unit
GDPR	General Data Protection Regulation
GUI	Graphical User Interface
HPC	High Performance Computing
ICT	Information Communication Technology
IT	Information Technology
IoT	Internet of Things
KPI	Key Performance Indicator
KYC	Know Your Customer
MGA	Managing General Agent
ML	Machine Language
MVP	Minimum Viable Product Platform

NGO	Non-Governmental Organization
NLP	Natural language processing
PSD2	Second Payment Service Directive
REST	Representational State Transfer
SME	Small and Medium-Sized Enterprises
VaR	Value at Risk
VASPs	Virtual Asset Service Providers
WP	Work Package

1 Introduction

1.1 Objective of the Deliverable

This document presents the Pilots' evaluation strategy, as well as their related outcomes, that enabled the evaluation of the Pilots from both business and technical/operational perspective. Such evaluation has been achieved by leveraging the stakeholders' feedback through the hosting of workshops and collecting the KPI measurements (so as other parameters), which were first reported in the deliverable D7.20 – Pilots' Evaluation and Stakeholders' Feedback – I.

This document is the second one of a triad that is being constructed through the 2nd phase of the Task 7.8, which is the most mature level of the periodic evaluation. Such process addresses the process of gathering the stakeholders' feedback, as well as the definition of a decentralized approach that allow the Pilots to collect the required data through the exploitation of workshops. Moreover, it presents the high-level vision of the Pilots' progresses, not only in terms of technical improvements (e.g., metrics' calculated deltas obtained from different time periods), but especially from the business-dimensions, which represent the core elements of the INFINITECH business-modelling and innovation management approach (better described in the deliverable D9.15 - Business Models and Innovation Management – I).

1.2 Insights from other Tasks and Deliverables

The evaluation reported herein leverages the outcomes of the stakeholders' workshops, from which it has been possible to gain a perception of the Pilots' results. It also relies on the ever-increasing synergies within the INFINITECH project to improve the way the business assessment is carried out. Such assessment is performed by fine-tuning the current approach – based on the aggregation of the stakeholders' feedback – to the INFINITECH business-model framework (described in the deliverable D9.15 - Business Models and Innovation Management – I). The INFINITECH Pentagon's Innovation Dimensions (see D9.15, chap. 5.2) has been leveraged for that purpose.

1.3 Structure

The deliverable at hand is structured as follows:

- Section 2 outlines the approach used to evaluate the Pilots' development (business-wise and technology-wise), as well as the following sub-sections:
 - Sub-section 2.1: describes the methodology, the feedback collection strategy, and the evaluation goals.
 - Sub-section 2.2: presents the contents and the structure of the questionnaire used to collect the stakeholders' feedback.
- Section 3 shows the workshops' outcomes (i.e., INFINITECH innovation pentagon, the KPIs, and lessons learned) with respect to each Pilot with the goal of depicting an overall status of its development;
- Section 4 presents a summary of the Pilots' outcomes clustered according to different types of businesses and technologies. The section also reports the aggregated final remarks;
- Section 5 outlines the conclusions;

- Section 6-7 provide an overview of the stakeholders' workshops held by the Pilots over the timespan of March 2021 – February 2022;
- Section 8 lists the references.

2 Evaluation Approach

The objective of this section is to first present the methodology followed to track Pilots' progress from the business side and the technical/operational (aimed at setting the ground to perform a multi-faced assessment of the Pilot system). Subsequently, it will be described the aggregation model (survey), whose structure have been increasingly refined and reshaped as to find the right balance between the effort and the efficiency while collecting the stakeholders' feedback during the workshops.

2.1 Methodology

ABI Lab Consortium has recently started the 2nd phase of the Evaluation Process, whose approach can be summarized in the following two sub-phases (see Figure 1):

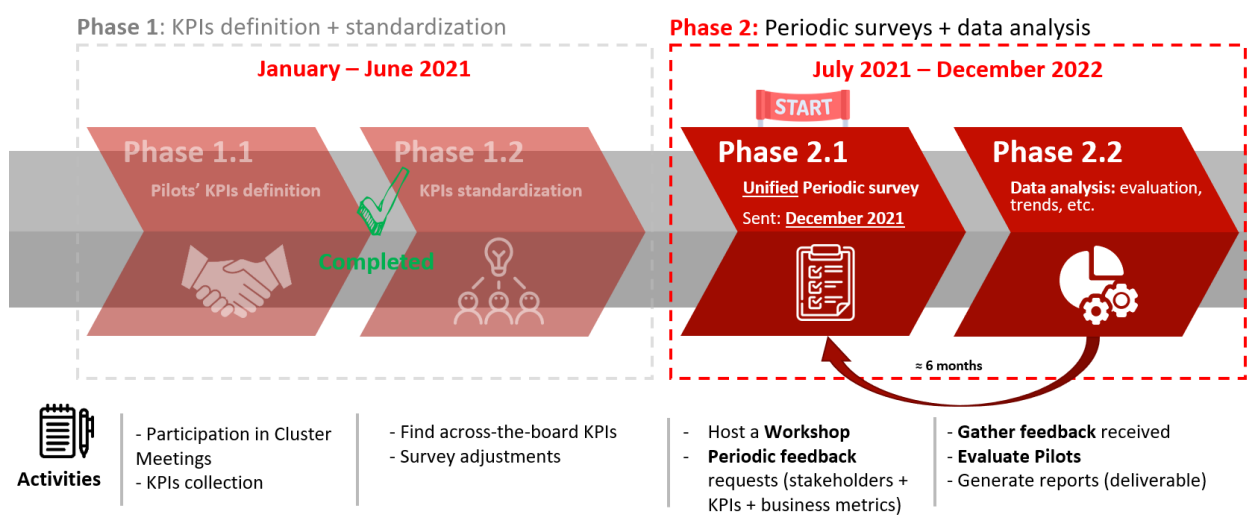


Figure 1 Evaluation Framework (2nd phase – cyclic process)

Sub-phase 2.1 – Requires the Pilot to host a meeting with the stakeholders (e.g., workshop, corporate meeting, Work Package (WP) level meeting, external event, etc.) and consequently provide the collected feedback in a unified survey. Such feedback is nothing but the aggregation of the outcomes of the post-event session concerning the stakeholders' satisfaction related to the Pilot's solution;

Sub-phase 2.2 – Once the Pilot's workshop results are provided within the survey, as well as the other metrics reported within the questionnaire (i.e., KPIs and additional business metrics), the ABI Lab Consortium will be enabled to collect the aggregated outcomes, analyze the data therein reported, start defining trends, making evaluations, as well as to picture the evolution of the INFINITECH project.

Such phases are meant to periodically repeat every 6+ months. The exact timing slightly varies according to the Pilots needs, as well as to identify the most suitable time-window to conduct additional workshops with the stakeholders.

The first iteration of workshops, as well as its following evaluation, have been conducted following the roadmap reported below:

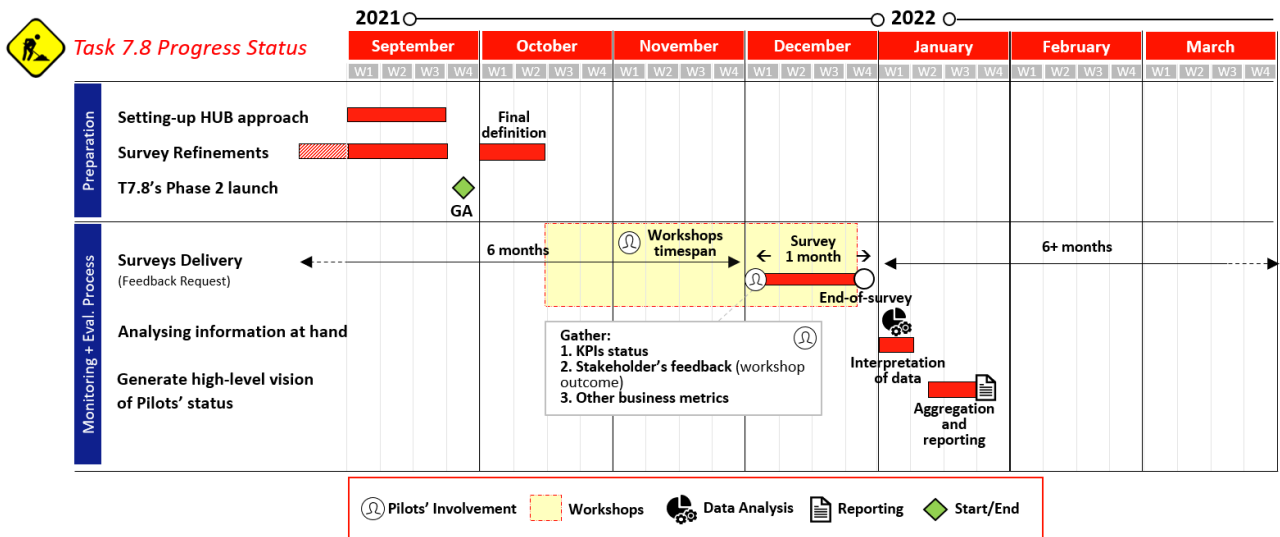


Figure 2 Pilots' Workshops and Evaluation timeline

The idea behind such a timeline, is that every Pilot is required to host a meeting (of any kind) with the stakeholders within the timeframe of the yellow box (see Figure 2) that goes from mid-October until mid-December, providing that the Pilots come back with the outcomes by the end of December itself. In such way, the ABI Lab Consortium was enabled to interpret the reported data and make this deliverable out of the high-level view of the observed improvements.

Regarding the type of meetings and the way to collect the feedback, it has been assessed to be highly valuable that the Pilots independently find its own way to better collect the stakeholders' feedback, since each Pilot has its own diverse set of peculiarities (e.g., different stakeholders, context, business-cases, objectives, etc.). Therefore, with this goal in mind, it has been agreed not to bind the Pilots to standards, which only end up weighing down their flexibility and cause potential incompatibilities. Rather, it has been decided to foster flexibility, enabling the Pilots to take any collection strategy they desire (whether structured or not) to support a seamless progress within the INFINITECH project.

The following is a list of meetings the Pilots could hold with the stakeholders:

- Workshop;
- Corporate meeting;
- Direct contact;
- External event (e.g., Conference);
- WP-level meetings.

As for the way the Pilots can collect the feedback from the stakeholders, they can rely on the following live poll tools, which are available online:

- Slido;
- Mentimeter;

- Poll Everywhere;
- Doodle;
- Team’s integrated anonymous polls (aka Forms).

Within the context of the 2nd phase of the Evaluation Process, it has become paramount to make the aggregation model more in tune with the INFINITECH business approach, as well as to find the right balance between the survey’s complexity and the need to collect relevant information out of the stakeholders during workshops.

That is why, ABI Lab Consortium leveraged the INFINITECH Pentagon’s innovation dimensions and included them in the survey – first presented in the previous deliverable (D7.20). Accordingly, there has been a work of merging all the metrics within one all-encompassing unified questionnaire, whose simplification was necessary not only to overcome the well-known difficulties in collecting comprehensive feedback, but also to ensure an effective data reliability for analysis as well as to guarantee some degree of flexibility during data collection.

The overall idea of the questionnaire (and its following evaluation) is to provide a set of standard questions which is uniform across the Pilots’ system and reported under different business dimensions [4]. Such dimensions are then evaluated by the Pilots/Stakeholders, and this eventually enable to aggregate and depict the results within a graphical pentagon (see Figure 3).

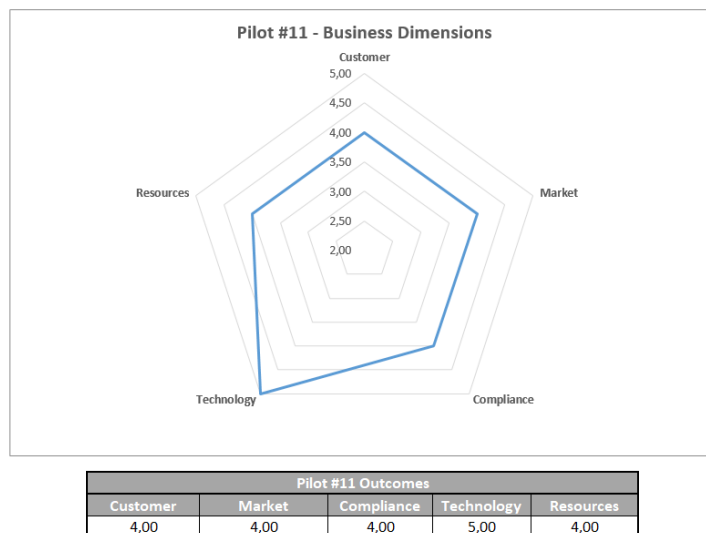


Figure 3 Example of Business Dimension's levels (results)

An example of dimension’s calculation could be the following: under the “Customer Perspective” there are two questions, and for each of them the Pilot/Stakeholders will attribute a rank – ranging from 1 to 5. Alongside this rank, the Pilot also provide an aggregated description that explains as to why the metric has reached such a level, as well as whether there are any potential changes that could be made to make the product/service better fit the stakeholders needs. Hence, assuming the Pilot obtained the tuple (3, 5) out of the workshop, then its average provides an overall satisfaction – (4) – with respect to that vertex of the pentagon.

Eventually, once the Pilot compile the whole survey, it will be possible to build up a comprehensive pentagon whose vertices are the average of all the results of the innovation pentagon. Such graphical

illustration clearly displays an overall view of such levels from which it is possible to spot potential gaps (such outcomes will also be useful for the Reference Validation Model, as it represents a starting point from which it will be possible to provide recommendations/actionable insights to increase these levels). Not to mention that the results are corroborated by the textual evidence that help spotting further insights for improvements.

As far as the evaluation is concerned, it is worth noting that the INFINITECH ecosystem is made up of a diverse range of Pilots, each of which has its own peculiarities (i.e., different realities, stakeholders, business-cases, objectives, etc.). Therefore, some limitations might reside in the comparison of the level of satisfaction of the stakeholders with respect to different Pilots (as the indexes of goodness might not be directly comparable). However, some commonalities (i.e., the five dimensions of the INFINITECH Pentagon) of goodness have been found.

When it comes to the assessment of individual projects, the evaluation concerns do not stand. Indeed, the Pilots were able to engage and interact with the stakeholders as to acquire feedback on their solution's outcomes, both in terms of ratings and additional opinions/insights about potential future developments. All of this contributed to form an aggregated result that outlined the key drivers that lead to achieve such degree of satisfactions with respect to different areas of the Pilot's solution, as well as to suggest room for improvements. Hence, the projects can be accurately evaluated individually as the feedback received is relatively subjective to the Pilot's context.

Nonetheless, an aggregation attempt has been made. It has been possible to cluster Pilots oriented to different technological areas (i.e., AI, IoT and Big Data, Blockchain) and business types (i.e., B2B, B2C, Internal Processes), building up a common basis from which it has been possible to correlate and compare the satisfaction among all Pilots.

2.2 Aggregation model

The following are the information requested in the questionnaire:

- **Workshop Overview** (see Annex B for more details)
 - Workshop Title
 - Date
 - Agenda
 - Link to the event (if applicable to the event type)
 - Event Type
 - Duration of the Event (h)
 - Number of participants
 - Players Involved

INFINITECH - Pilot Workshop Overview					
Workshop Title:				Date:	dd/mm/yyyy
Agenda: (description of the topics presented)					
Link to the event: (if applicable to the Event Type)					
Event Type:	Duration of the event (h):		Number of Participants:		
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)					

Figure 4 Pilot Workshop Details

- **Stakeholders' satisfaction** with respect to the INFINITECH Pentagon's innovation dimensions (see Figure 5):
 - Customer
 - Market
 - Resources
 - Compliance
 - Technology

Market Perspective <small>(the following feedback are the results of data aggregation)</small>	
Feedback received by your Community regarding the <u>market saturation, competition</u> as well as <u>positioning</u> . Provide evidences that explain why the metrics have reached such level. Is there anything you can do to make your product/service better fit the stakeholders needs?	
<input type="radio"/> Excellent <input type="radio"/> Very Good <input type="radio"/> Good <input type="radio"/> Fair <input checked="" type="radio"/> Poor	
Compliance Perspective <small>(the following feedback are the results of data aggregation)</small>	
Feedback received by your Community regarding the <u>coherence of the solution with the compliance constraints</u> (external regulations and internal procedures). Provide evidences that explain why the metrics have reached such level. Is there anything you can do to make your product/service better fit the stakeholders needs?	
<input type="radio"/> Excellent <input type="radio"/> Very Good <input type="radio"/> Good <input type="radio"/> Fair <input checked="" type="radio"/> Poor	
Technology Perspective <small>(the following feedback are the results of data aggregation)</small>	
Technological Capability & Readiness	Provide evidences that explain why the metrics have reached such level. Is there anything you can do to make your product/service better fit the stakeholders needs?
<input type="radio"/> Excellent <input type="radio"/> Very Good <input type="radio"/> Good <input type="radio"/> Fair <input checked="" type="radio"/> Poor	

Figure 5 Pilot's Questionnaire – Pentagon's subset

- **Operational and business-related aspects:**
 - Operational-driven and Business-driven **KPIs** (common and Pilot-specific ones);
 - Additional **business metrics** (see D7.20 – "Chap 2.3 Monitoring Process"). Some of these are:
 - Deviation from timeline
 - Projects adjustments
 - Number of critical problems reported
 - Etc.

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency <i>(common-KPI)</i>	O/B	Average of the percentages in the two operational pilot-specific KPIs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n.d.	44,65%	58,75%	75%	NO
User Satisfaction <i>(common-KPI)</i>	B	Weighted average of the percentages in the three business pilot-specific KPIs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	60%	NO
At least 75% of the clients complete more than 85% of all triggered questionnaires forwarded to them in the past 2 months	O	Objectively determined by the data collected at Healthentia	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n.d.	46,40%	83,02%	75%	YES
At least 75% of the clients wear their sensors to provide the automatic measurements for at least 6 out of 7 days in each of the	O	Objectively determined by the data collected at Healthentia	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n.d.	42,90%	34,48%	75%	NO
At least 75% of the clients are satisfied with the mobile app after 2 months of use	B	Subjectively reported by the clients in a survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	75%	NO
Upon completing the 2nd month of their usage of the mobile app, at least 50% of the clients are	B	Subjectively reported by the clients in a survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	50%	NO
At least 50% of the health insurance professionals can confidently determine insurance premiums	B	Subjectively reported by the health insurance professional	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	50%	NO

Figure 6 Example of a Pilot's KPI Table

Date	Percentage of Completion	Deviation from Timeline	Deviation from Expected Effort	Number of Critical Problems Reported	Project Adjustments	Core Model Accuracy	Goodness of Fit
	<i>i.e. 36%</i>	<i>i.e. +2 months (delay)</i>	<i>i.e. +15% (delay)</i>	<i>Criticalities addressed that potentially implied an adjustment to the project</i>	<i>Number of changes made to the project</i>	<i>Accuracy Level of the core AI model in making predictions / classifications</i>	<i>Measure of the quality of observation data</i>
11/06/2021	30%	On time	0	0	0	F1 score above 50%	n.a.
27/12/2021	50%	On time	0	0	0	F1 score above 70%	n.a.

Figure 7 Additional Business Metrics

Overall, the utility of the questionnaire is twofold: it could be either used by the Pilots as a template aggregation model in which to report the workshop’s outcomes; or it could work as a source from which to extract the questions to be then shared with the stakeholders (as the questions therein reported already represent what will be required to asked to them). Both strategies could be pursued by the Pilots.

3 Pilots Evaluation

In this section, the Pilots' outcomes will be outlined, whose results have been assessed based on the feedback received by the stakeholders and provided aggregately by the Pilots. This is meant to achieve a straightforward overview of all the Pilot system regarding their status with the INFINITECH Business Dimensions, KPI measurements, Solution's Development and Lessons Learned.

See Annex A to see more information about the players who evaluated the Pilots' solutions.

The evaluation is based on the following main metrics:

- **INFINITECH Innovation Pentagon:** results calculated as the average of the stakeholders' feedback obtained over the 5 innovation areas (vertices), whose scores range from 1 to 5;
- **% Customer Satisfaction:** measured as the ratio of the KPI value in relation over the target level;
- **% Core Task Efficiency:** measured as the ratio of the KPI value in relation over the target level;
- **Monitored KPIs:** percentage of the KPIs being monitored by the Pilot;
- **Pilot Completion:** percentage of currently achieved milestones against the total number of future milestones (namely, at what point the Pilot is located on the *timeline* set);
- **Deviation from Timeline:** the time difference between the planned baseline against the actual schedule;
- **Number of Critical Problems Reported:** criticalities encountered that have implied adjustments to the project;
- **Project Adjustments:** number of changes made to the project in terms of contents, timetable (rescheduling activities), number of non-planned/extra activities, etc.;

3.1 Real-time risk assessment in Investment Banking

3.1.1 Outcomes

In the latest workshop, Pilot #2 engaged with 38 stakeholders made up of AI experts, finance partners, researchers, traders and financial institutions. From such interactions, the Pilot achieved the following results (see Figure 8):

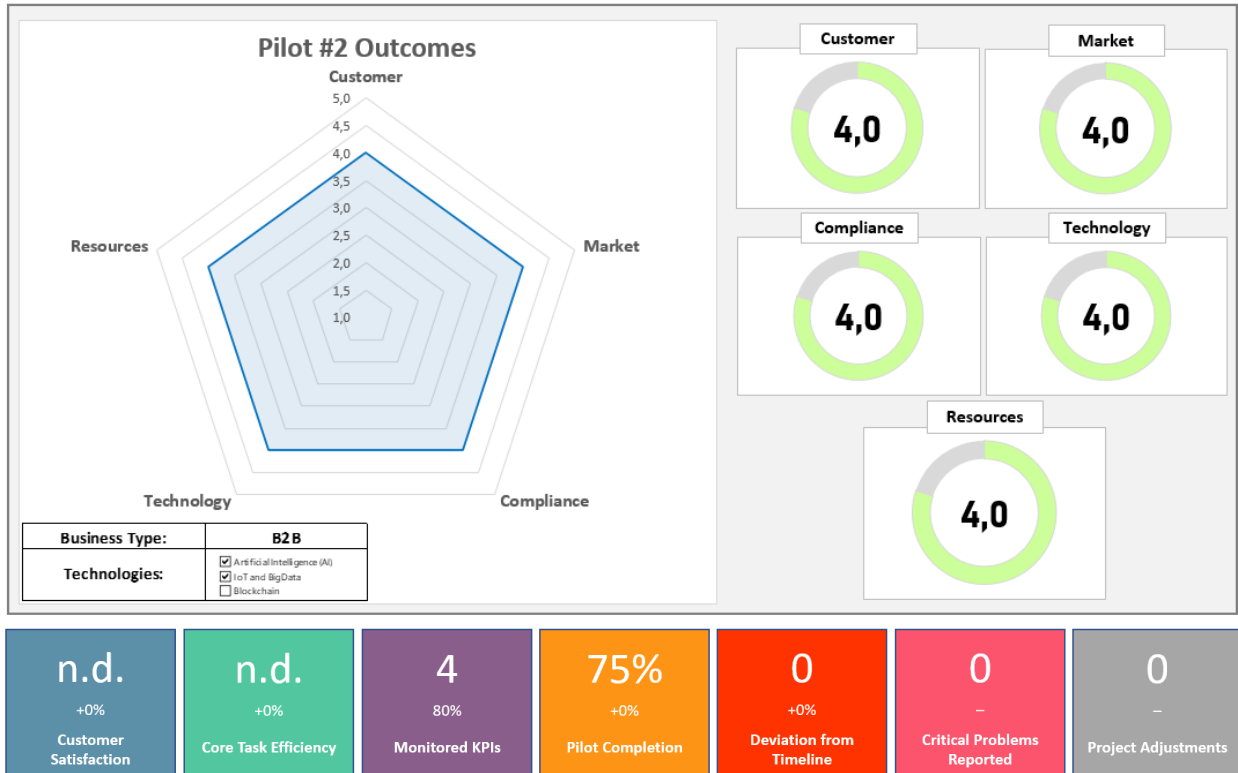


Figure 8 Pilot #2 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- **(Near) Real-time risk assessment:** one of the added values of the tool developed within the Pilot is that enables stakeholders-users, such as traders and risk managers, a near real time risk assessment with several additional futures, including sentiment analysis. The required time to obtain risk estimations is in accordance with the target KPIs. Notably, the *Value at Risk/Expected Shortfall* (VaR/ES) of a portfolio consisting of 4 instruments can be obtained in less than 1 second enabling also the what-if analysis. Furthermore, the DeepVaR algorithm – developed in the context of the project – turns out to be a reliable alternative to classical VaR approaches delivering accurate VaR estimations even in periods of high volatility in financial markets. Such enhancements in performance have been validated through the deployment of the Pilot #2 in the dedicated testbed and its back-testing in a large amount of historical data.
- **Assessment Optimization:** the Pilot’s solution will significantly help financial institutions to optimize their risk assessment with respect to the standards on minimum capital requirements (Basel Committee on Banking Supervision).
- **Quicker Reactions:** the Pilot’s solution enable quicker reactions and give the possibility to adjust portfolio composition, if needed. To this end, the provided solution should be able to make use of the most recent market data and, based on the entry trading positions, provide valid risk measurements.
- **Towards a Higher degree of Innovation:** since many financial institutions are still implementing risk assessment tools based on End-of-Day (EoD) data rather than on intraday basis, the Pilot has the goal in mind to generate an innovative product for use with real-time data.

- **Highly Interoperable/Scalable:** the system's architecture is fully compatible with the INFINITECH model as its internal components are REST API. As a result, the provided solution can be integrated into different data sources and/or systems with minimal configuration required. In addition, the whole solution is highly scalable since i) the risk measurements are initially calculated for each input time series in a univariate and parallel way and ii) its development is based on Kubernetes which allow distributed computations with auto-scaling in resources.
- **Easy-to-understand:** the solution is easy to use and provides an easy-to-understand visualization. This means that no special skills are required on the user side. The tool provides further information based on what-if analysis. It can be used to access real-time risk analysis of pre-trades and can evaluate them both individually and at the overall portfolio level. However, future improvements could be made: enable a comparison of the risk analysis with multiple VaR models (e.g., variance-covariance methods, historical VaR, etc).

Find below the status of the Pilot's KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency (common-KPI)	O	Number of assets per FX portfolio for which the risk is calculated in real time	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0	4	4	10	NO
User Satisfaction (common-KPI)	B	Arithmetic average based on the evaluation of three sub-KPIs (intuitivity, usability, effectiveness)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	N/A	N/A	N/A	> 4	NO
Fewer VaR violations compared to existing models [$P(r < VaR_a) = 1 - \alpha$]	O	Percentage of daily VaR/ES violations per year in confidence level 99% (mean value between utilized portfolios)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2,5%	<1%	<1%	<%1	YES
VaR estimation of multi-asset portfolios in less than 5 seconds	O	Seconds	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3 sec (4 FX assets per portfolio)	1 sec (4 FX assets per portfolio)	1 sec (4 FX assets per portfolio)	1 sec (10 FX assets per portfolio)	NO
Real Time VaR availability instead of daily (batch) VaR estimation	B	Seconds	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	300 secs (4 assets per portfolio)	60 secs (4 assets per portfolio)	60 secs (4 assets per portfolio)	60 sec (10 assets per portfolio)	NO

Figure 9 Pilot #2 KPIs Status

As documented in D9.13, Pilot #2 goes beyond the state-of-the-art by providing the following key functionalities:

1. Risk assessments in real-time based on the latest market data leveraging INFINETCH's data management technologies.
2. SotA AI-based risk modeling (i.e., DeepVaR) while most of the competitive products are limited to standard econometric models such as linear regression and AutoRegressive Integrated Moving Average (ARIMA).
3. Real-time sentiment analysis utilizing transfer learning and natural language processing in financial news feeds.

Moreover, the evaluation results of the DeepVaR algorithm as well as the transfer learning approach used for the sentiment analysis, presented in D5.9, show that the Pilot's technological tools fulfill the set KPIs offering better results than other established benchmarks

3.1.2 Lessons Learned

The various stakeholders of Pilot #2 who participated in the 1st workshop, such as AI experts, financial partners, researchers, traders, financial institutions, contributed significantly with their comments and suggestions to the development and evolution of the Pilot. In addition, internal feedback from traders and

JRC managers regarding the platform and financial news feed was also an important factor in the progress of the service.

Some comments from the stakeholders highlighted the need for more technical details of the utilized algorithm and performance results. Given that our scientific paper entitled “DeepVaR: A Framework for Portfolio Risk Assessment leveraging Probabilistic Deep Neural Networks” is under revision from the Digital Finance Journal [1], such information will be openly available as soon as this work is published.

Additionally, other stakeholders indicated the need for live demonstrations. In our second workshop, planned for the 5th, April of 2022, in collaboration with the H2020 Triple-A project a live demo of the Pilot’s solution will be presented while after on there will be a particular time slot for stakeholders' questions and feedback.

3.2 Collaborative Customer-centric Data Analytics for Financial Services

3.2.1 Outcomes

In the latest workshop, Pilot #3 engaged with 9 stakeholders made up of banks, consultants, technology vendors and academia. From such interactions, the Pilot achieved the following results (see Figure 10):

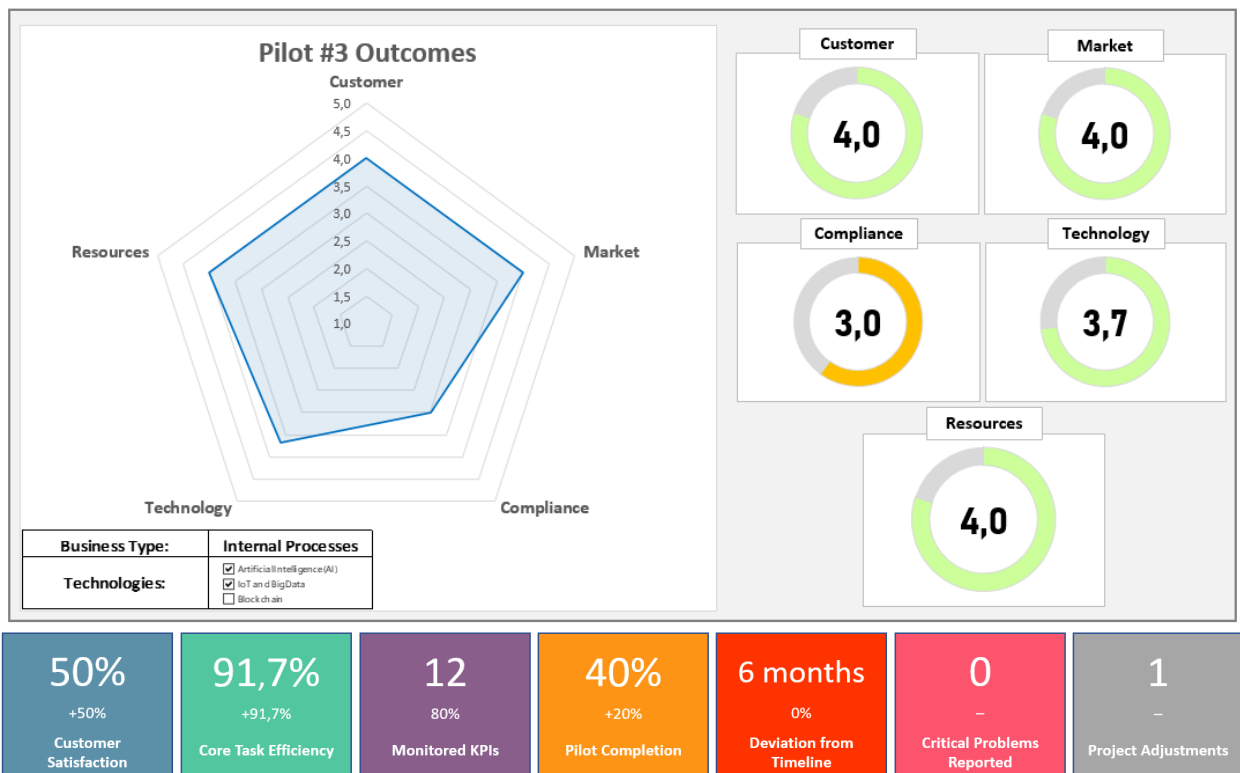


Figure 10 Pilot #3 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- Multiple Stakeholders Engagement:** the key challenge that will lead the solution to its success is to be able to ensure multiple stakeholder engagement on the system. To achieve this type of

engagement, the project team will present the Pilot to the Irish Joint Intelligence Group – consisting of seven financial institutions and Irish Law enforcement. Later in the project the Pilot will seek to present to the International Joint Intelligence Group – consisting of nine of the largest International Banks who operate out of Ireland.

- **High degree of Innovation:** the stakeholders turned out to be somewhat satisfied about the innovation around typologies. The Pilot has taken a very innovative approach to sharing the benefits while remaining compliant with the *General Data Protection Regulation* (GDPR).
- **Potentially Good Market Positioning:** due to the fact that in the current landscape it is not clear who the other competitors are, it could become a fairly powerful tool to be leveraged, provided there are a high degree of participation amongst stakeholders.
- **Challenges in the ever-evolving Compliance:** the proposed solution addresses current compliance issues. However, as the solution evolves over time, issues regarding data privacy might arise and become more challenging.
- **Well-Architected:** out of the workshops held with the stakeholders, the solution has appeared to be well architected. Its technological capability will surely benefit from more integrations with new banks.
- **Better Accuracy Supporting Organizations:** sharing of typologies will give rise to less false positives, allowing staff to cover a wider range of investigations with a greater focus on actual cases.

Find below the status of the Pilot's KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency (common-KPI)	O	(P3-KPI-KYC1) Organization of a KYC/KYB for banking and Insurance Sector workshop triggering an analysis and the survey first collection of Feedback	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	100%	n.d.	YES
	O	(P3-KPI-KYC2) Defining the procedure for aggregating the confidence scores from the NLU models for each red-flag indicator contained in the typology and ranking the highest scoring typologies.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	75%	n.d.	NO
	O	(P3-KPI-KYC3) Enabling a KYC/KYB for banking and Insurance Sector workshop triggering an analysis and the survey first collection of Feedback.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	100%	n.d.	YES
User Satisfaction (common-KPI)	B	(P3-KPI-AS1) Organizing two banking and Insurance Sector stakeholders and organisations event/workshop triggering the awareness and collaboration.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	50%	n.d.	NO
	B	(P3-KPI-AS2) Combination of Bank of Ireland FIU team end-user participants and the Financial Institutions operating in the Irish market (Banking Payment Federation of Ireland member organization).	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	50%	n.d.	NO
Use of different data sets	O	(P3-KPI-D1) Enabling the use of the sample datasets during the project	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0%	50%	n.a.	NO
	O	(P3-KPI-D2) Providing the prototype implementation and enabling the demonstration and use of the data sets during the project.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20%	25%	n.a.	NO
Use of Single Data Model for data processing	O	(P3-KPI-D3) Providing the prototype implementation and the demonstration and use of the applications and/or methods during the project.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	25%	n.d.	NO
	O	(P3-KPI-D4) Providing the prototype implementation providing the demonstration and use of the reference use case during the project.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	25%	n.d.	NO
	O	(P3-KPI-D5) Providing the demonstration and use of the common data model during the project, using the proposed BOI Data model.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	30%	n.d.	NO
Reduction of false positives based on enriched input data	B	(P3-KPI-AS3) Enabling the FIU teams or other organisations interested to have a repeatable & reliable application for identifying human trafficking related services.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	15%	n.d.	NO
	B	(P3-KPI-AS4) Enabling the FIU teams to have a repeatable & reliable process for identifying human trafficking related red-flag typologies to use in their KYC processes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	50%	n.d.	NO
	B	(P3-KPI-AS5) Aggregating the confidence scores from the NLU models for each red-flag indicator contained in the typology and ranking the highest scoring typologies.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	0%	n.d.	NO
Profile identification accuracy based on input data	B	(P3-KPI-KYC4) Identification & generation of five human trafficking centric red-flag typologies which are integrated within the Bank of Ireland FIU Know Your Customer processes and/or systems.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	0%	n.d.	NO
	B	(P3-KPI-KYC5) Having ready a comprehensive report that study the different integration and interoperability solutions for data sharing in the context of KYC/KYB.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	0%	n.d.	NO

Figure 11 Pilot #3 KPIs Status

At the current moment, it is difficult to define the state-of-the-art KPIs with regard to *Know Your Customer* (KYC) and Human Trafficking as Human Trafficking has only recently been added to the behaviors that banks look for when considering KYC. Currently, KYC checks within a bank's data sets depend on a transaction monitoring system that does not use Human Trafficking Red Flag typologies created by analysis of big data.

Some data analysis is done by some banks using a system (TAH) based on geographical location of Human Trafficking incidents. The TAH data is 80% open source and 20% NGO-contributed and anonymized. This can produce several false positives.

A 3rd party user of TAH has integrated the TAH typologies with machine learning as a basic prototype and produced significantly less false positives than its current transaction-based system. P3 will pick up on this research and apply it to the P3 product

Less than 30% false positives are P3s initial target. FPs are then expected to reduce as more users of P3 share data and typologies so that FPs reduce to a de minimis.

3.2.2 Lessons Learned

1. P3 address KYC issues for banks by using AI to search for Human Trafficking typologies within the bank's own customer data. P3 will become more effective if typologies that give results are shared between banks. This throws up data privacy issues. EU law on Data Privacy currently can be interpreted that it gives criminals data privacy with certain derogations and "let outs" for public interest. Whether a bank's KYC needs can be said to be in the public interest is unclear. On one hand using a negative KYC result to undermine the economics of human trafficking is certainly in the public interest, on the other hand a bank is not a prime engine of law enforcement and as such may not be able to make a clear judgement that their customer is carrying on criminal activities and so is not entitled to data privacy. In order for banks to be able to share the red flag typologies that have produced positive KYC results, data privacy policy will have to take the P3 product into account. One member of P3 is BPFi who are able to influence Irish and EU DP policy as it applies to banks in Ireland.
2. The P3 tool will become more powerful with more participators. P3 is actively disseminating the tool via webinars with the JIG (see above) and the IJIG in April. P3 also disseminates the use of the tool via a monthly analysts call of all users of TAH (up to 65 organizations). Bol is a known leading contributor of Human Trafficking alerts to law enforcement and has had positive media exposure for doing so. Bol expects the P3 tool to enhance its already industry-leading stance on human trafficking. These initiatives are expected to add significantly to the number of P3 users when it is finally launched on the market.

3.3 Personalized Portfolio Management ("Why Private Banking cannot be for everyone?")

3.3.1 Outcomes

In the latest workshop, Pilot #4 engaged with 17 stakeholders made up of researchers and employees belonging to banks, financial institutions and Fintech companies. From such interactions, the Pilot achieved the following results (see Figure 12):

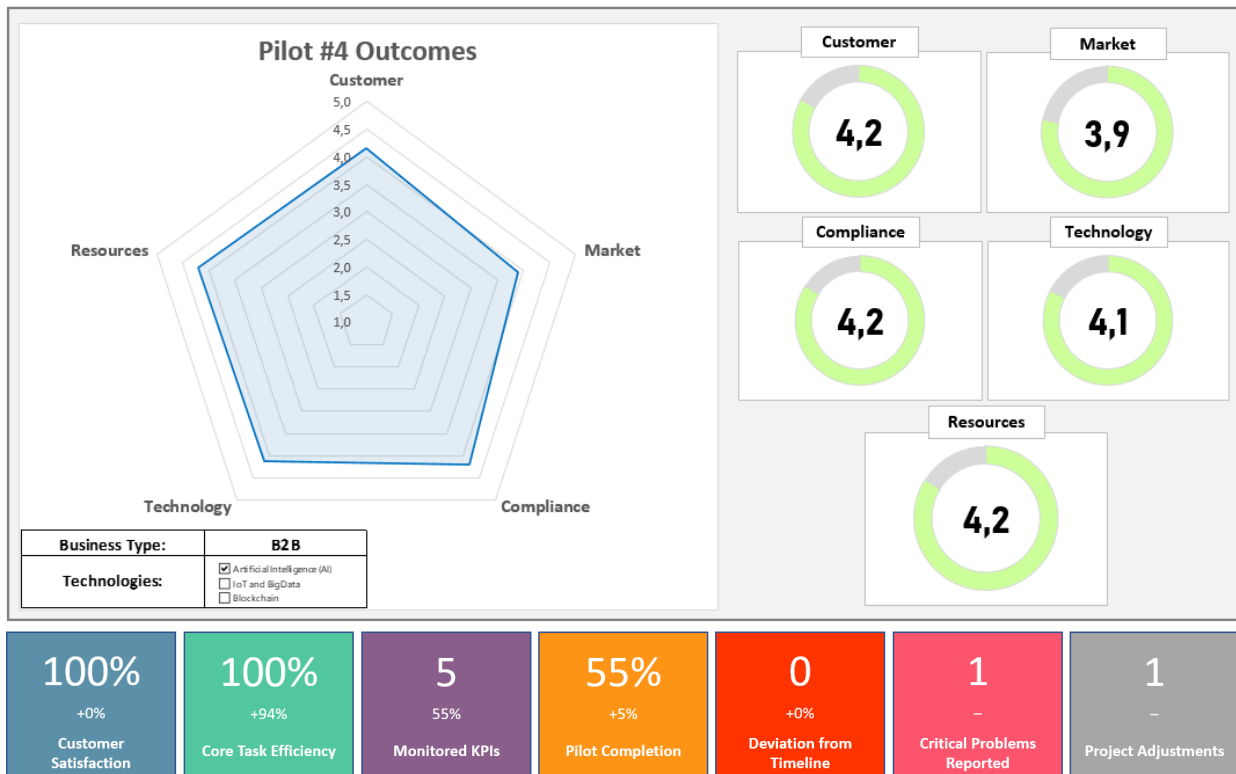


Figure 12 Pilot #4 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- More Streamline Processes:** the Pilot's modular solution (AIGO - *AI-based Genetic Portfolio Optimization*) allow to streamline processes to make financial intermediaries and advisors more efficient and to enable them to concentrate on customer advisory and an automated offering for "Private Banking" like services to the retail space. Pilot's goal is to automatically construct an optimised portfolio by modeling the investment advisory and decision process using a certain level of AI based procedures. The result is a tailored portfolio for each individual investor. All functionalities shall be also available via API access, which should be a kind of "Fintech-as-a-service" (FaaS) offering. It is expected that the first real B2B customer use-cases will show, how these kind of "personalised portfolios" can create a positive impact on the advisory and sales processes for financial intermediaries. Then a more detailed view, how these "personalisation" approaches assist and support a more digitised advisory journey and helps financial institutions to serve existing customers better and win new customer segments, which are not yet using professional investment advice (as 70% of individual assets from retail customers is not professionally managed so far).
- High degree of Innovation:** the stakeholders turned out to be somewhat satisfied about the solution's innovation in terms of both business and technical perspective. As identified during the workshop, the following are the main areas of innovation:
 - Business Innovation: Automatic Risk Scoring, Personalisation via various Preference Selections, AIGO flexibility in Portfolio Construction;
 - Technical Innovation: AIGO (newly developed AI based portfolio construction tool).

- **High Accuracy and User Satisfaction:** reportedly (see KPI table below), most accurate versions of the defined measurements have been achieved.
- **Fully Scalable and Rapid:** the Pilot's solution is eligible to provide a fully scalable digitised advisory and wealth management journey for financial institutions and market participants. Moreover, the algorithm has been assessed to run very fast, even for large portfolios and a large universe (for the 8000+ scenarios tested, over 50% of the responses were obtained within 4 seconds; only a very small proportion requiring a response time of over 10 seconds).
- **Challenging Competitive Market:** the need for “hyper-personalisation” of portfolios poses a challenge as operationally, most firms are not set up to cope with this and, given the high cost of maintenance, can only offer personalized portfolios to their ultra-high-net-worth clients. Competitors from Asia and North America are vying to exploit this opportunity. Global competitors in this space are – to a certain extent – Quantifeed (HK), FNZ (NZ) and Envestnet (US). However, within such a competitive landscape, the Pilot's solution looks promising especially due to the previous desirable feature of being fully scalable.
- **Clear Compliance:** the Pilot's solution would allow financial intermediaries and advisors to offer bespoke wealth management solutions to customers at scale through use of AI based portfolio construction tools while adhering to various regulatory compliances. Both quantitative and qualitative historical data will be leveraged for personalizing the portfolio construction and investment proposals, rendering the journey clear from a regulatory perspective.
- **Satisfactory levels of Readiness and impact to financial, staffing and skills:** as the development of AIGO tool is associated with high development efforts and continuous research, the readiness of the tool is highly correlated with the available resources. In terms on organization readiness to provide the tool to potential early adopters, the Pilot had several presentations and project meetings with the customers for advisory journey and AIGO functionality based on Pilot developments.

Find below the status of the Pilot's KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency (common-KPI)	O	How quickly a personalized and optimized portfolio can be generated?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Normal Advisory Journey. Typically, 2-4 hours	<1-3 minutes	5-10 seconds	10-20 seconds	YES
User Satisfaction (common-KPI)	B	UI Journey user friendly experience score	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Portfolio score risk-return is developed, as well as individual factor score. This allows us to understand the quality of the results. The goal was to create a first prototype allowing the user to check on understandability & accuracy of the tool (whether it is easy for the user to interact with the tool).	Further and ongoing measurement of the portfolio return score. First user prototype of the UI Journey (as described) is created.	Work in progress for 8-version	Most accurate version of the defined measurement. Achieved.	YES
Flexible portfolio construction based on personal risk profiling for retail clients	O	Number of fitness factors to choose from	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4 fitness factors	5+ fitness factors	7 fitness factors	+10 fitness factors. Depending on the customer requirements.	NO
Accuracy of individual portfolio construction based on individual customer preferences	O	Tools for the user to understand the quality of the results	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Portfolio score risk-return tool is developed. The goal: quality & transparency of the results.	Improvement of the tool showing the accuracy of the results.	Target achieved, no change	Most accurate version of the defined measurement. Achieved.	YES
Accuracy of portfolio reporting after portfolio construction and execution of investment decisions	O	Portfolio health score to monitor the quality of the portfolio over time	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The health score API as an ongoing monitoring tool	The health score API	Target achieved, no change	Completed	YES
Improved Advisor Productivity	B	Time frame needed for the portfolio generation Same to Core Task Efficiency	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Normal Advisory Journey. Initially, 2-6 hours	Currently, 5-10 minutes to generate the portfolio	Depends on the UI enhancement	5 minutes	NO
Hyper-personalization of portfolio construction	B	Generic investment theme method already implemented in the part of the fitness function topic	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Covered by some of the fitness factors	Will be covered by some of the fitness factors	Work in progress	n.d.	NO
Increased Customer satisfaction with better risk-adjusted portfolios (Advisor / End-user)	B	To be defined once at the later stage of the project once the development stage is completed and prototype is available	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	To be defined once the prototype is delivered	To be defined once the prototype is delivered	Work in progress	To be defined once the prototype is delivered	NO
Remove barrier to entry for professional wealth management solutions for retail customers (mass-affluent) and their advisors	B	The number of investors with lower investment portfolio horizons. The growth in the number of mass affluent customers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	n.d.	n.d.	Work in progress	n.d.	NO

Figure 13 Pilot #4 KPIs Status

The need for “hyper-personalisation” of portfolios poses a challenge for many existing firms in the financial sector as operationally, most of them are not set up to provide such a service, given the high cost of maintenance. Hence an offering of personalized portfolios can be provided only to their ultra-high-net-worth clients. Pilot #4 addresses this gap and offers such “hyper-personalisation” opportunities even for retail investors with smaller investment amounts.

In addition, in many other companies’ cases generation of portfolio can last up to some hours, which is not the case within the Pilot #4 setup (as currently portfolio generation is finished within a maximum of 5 minutes). Moreover, a big number of so-called robo advisors don’t offer personalized portfolios, but model portfolios, which excludes personalization.

3.3.2 Lessons Learned

One of the key lessons learned is that the need for personalization has been indeed increasingly recognized among various stakeholder groups as one of the key success factors of the developed product. This trend for personalization in the wealth management sector is also supported by the latest reports about developments in the financial industry. For example, according to the “2021 Wealth Research Report” by EY “the uncertainty and disruption of the past year have brought about profound changes in clients’ values. Those shifts are apparent in altered financial and personal goals, in revised views and beliefs, and in the increasing appetite and appreciation for digital tools” [2]. There are some other reports pointing out that a highly personalized and digitized customer experience is crucial to address the clients’ needs. Based on stakeholders’ feedback, we were able to identify that such personalized offering is indeed an increasing demand and must be further addressed in future offerings. It is also important to mention that during the execution the size of the portfolio needs to be taken into consideration, as portfolios with smaller portfolio volume should not exceed a certain number of different assets due to cost and execution issues.

3.4 Business Financial Management (BFM) tools delivering a Smart Business Advise

3.4.1 Outcomes

In the latest workshop, Pilot #5b engaged with 30 stakeholders made up of researchers and employees belonging to banks, financial institutions and Fintech companies. From such interactions, the Pilot achieved the following results (see Figure 14):

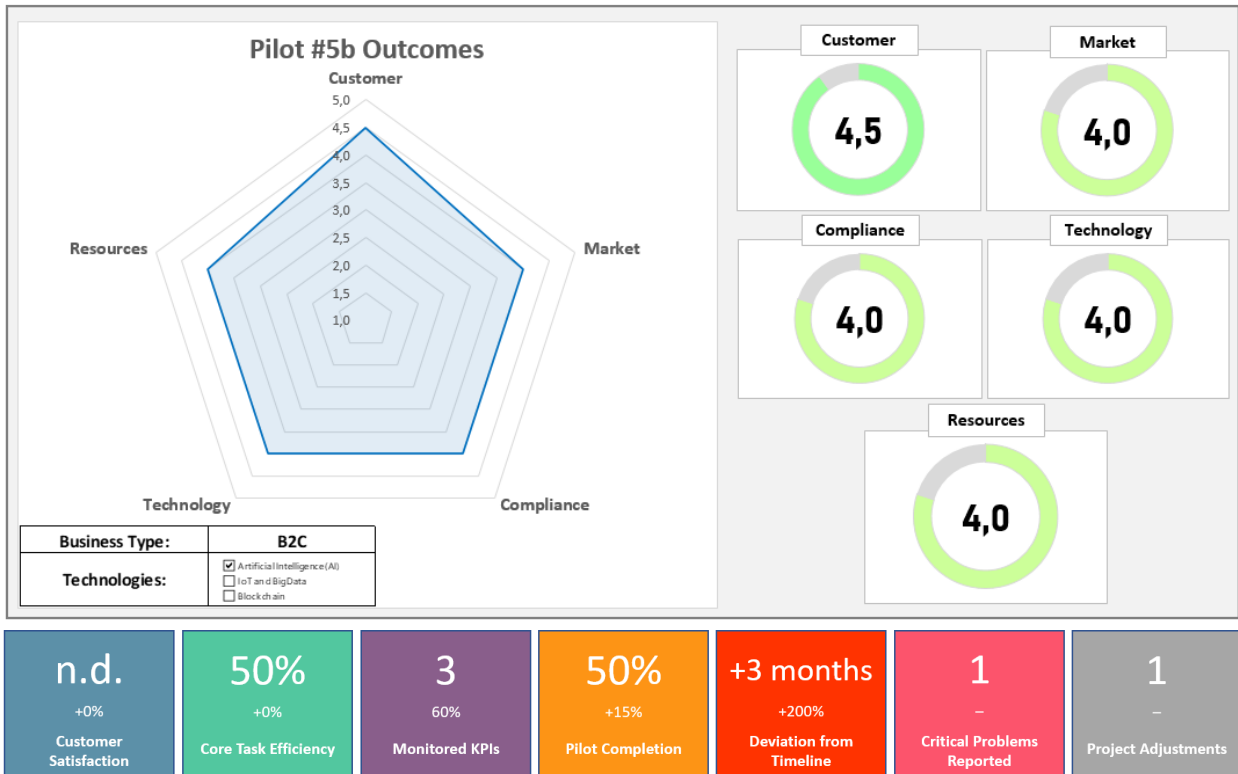


Figure 14 Pilot #5b Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- All-encompassing, easy to use Personalized microservices:** out of the interactions with the stakeholders occurred during the cluster workshop, the Pilot have gathered and achieved excellent levels from the solution’s utility perspective. The Business Financial Management (BFM) toolkit developed within the Pilot provide the ability to quickly and simply obtain an understanding of the business status, that is having a comprehensive health check available at the spot – is found to be an invaluable asset. Visibility of future cash flows, crucial for short term as well as medium term planning, is considered of key importance and appreciated to be part of the intended offering. Nevertheless, concerns regarding the required sharing of data are expressed. Further Small and Medium-sized Enterprises (SMEs) input will be considered as to make sure the developed solution will keep providing value to the stakeholders.
- Very Good Positioning:** Bank of Cyprus is, reportedly, the first bank in Cyprus offering a BFM bundle on top of their core business.

- **Compliant with the constraints:** compliance constraints have been considered at a project level as well as internally at the Bank's level.
- **Added Values:** Pilot's development enables new perspectives in the fields of data management, analytics and testbed development, supporting the bank's digital transformation. However, new technologies are explored and may be potentially introduced to future data analytical components.
- **High levels of scalability:** the “INFINITECH WAY” of development and deployment provides the necessary capacities for increased interoperability and scalability.

Find below the status of the Pilot's KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency: Overall Efficiency (common-KPI)	O	Combined efficiency (mean) of the pilot's two operational KPIs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	50%	50%	50%	100%	NO
User Satisfaction (common-KPI)	B	Actionable insights will be presented with a Like / No Like option. An average value of 80% like is anticipated.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
Transaction Categorization Rate	O	>90% transactions categorized	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	88%	96%	96%	> 90%	YES
Smart Virtual advisor Response time	O	Response time < 1 sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
Customer Engagement	B	Increase in customer logins & time spent logged in	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO

Figure 15 Pilot #5b KPIs Status

The operational KPIs chosen, namely the transaction categorization rate (target >90%) and smart virtual advisor response rate were chosen based on business standards, interaction with SMEs-potential users, research, and bank experience. In more detail, if the response time, even for complex functions and AI models exceeds 1 sec, then in combination with network traffic – additional 1 or 2 secs – the user conceives a lack of real time interaction and tends to lose his focus/interest, resulting in a bad user experience. As for the transaction categorization accuracy rate, even a small error rate is considered acceptable as by nature, a 100% categorization rate cannot be achieved. Nevertheless, a transaction categorization accuracy rate above 80% must be retained to avoid losing trust in the engine's outcome and the rest of the interconnected microservices (i.e., Cash Flow Prediction outcomes).

3.4.2 Lessons Learned

- To attract SME customers, the BFM platform services added value should be clearly communicated and showcased with examples on how the various offerings (i.e., smart transaction categorization) can support the business owner with everyday financial cash flow tasks so that he can focus on his/her core business.
- Conducting and processing the results of 1 to 1 SME workshops proved to be a cumbersome task, resulting in contradicting preferences and propositions among SMEs, mostly due to the different nature of their core business models.
- The data tokenization at the bank's premises decreased data compliance challenges on the one side, increasing however on the other side the data preprocessing needs and causing a delay to the introduction of near real-time data streaming functionalities related to transactional data.
- Outsourcing Banking data to cloud providers is quite a complex task and there are no specific guidelines except from EBA 2017.

- Leveraging Open Banking data remains a difficult undertaking, requiring the user’s permission in regular intervals. The development of a Financial Data Space appears to be a good solution to address many challenges. - Lack of FAIR Data
- Lack of explainability and trust in financial AI models with new regulations being introduced, requiring the utilization of explainable AI models (i.e., LIME and SHAP frameworks).

3.5 Personalized Closed-Loop Investment Portfolio Management for Retail Customers

3.5.1 Outcomes

In the latest workshop, Pilot #6 engaged with 22 stakeholders made up of employees belonging to banks, financial institutions and Fintech companies. From such interactions, the Pilot achieved the following results (see Figure 16):

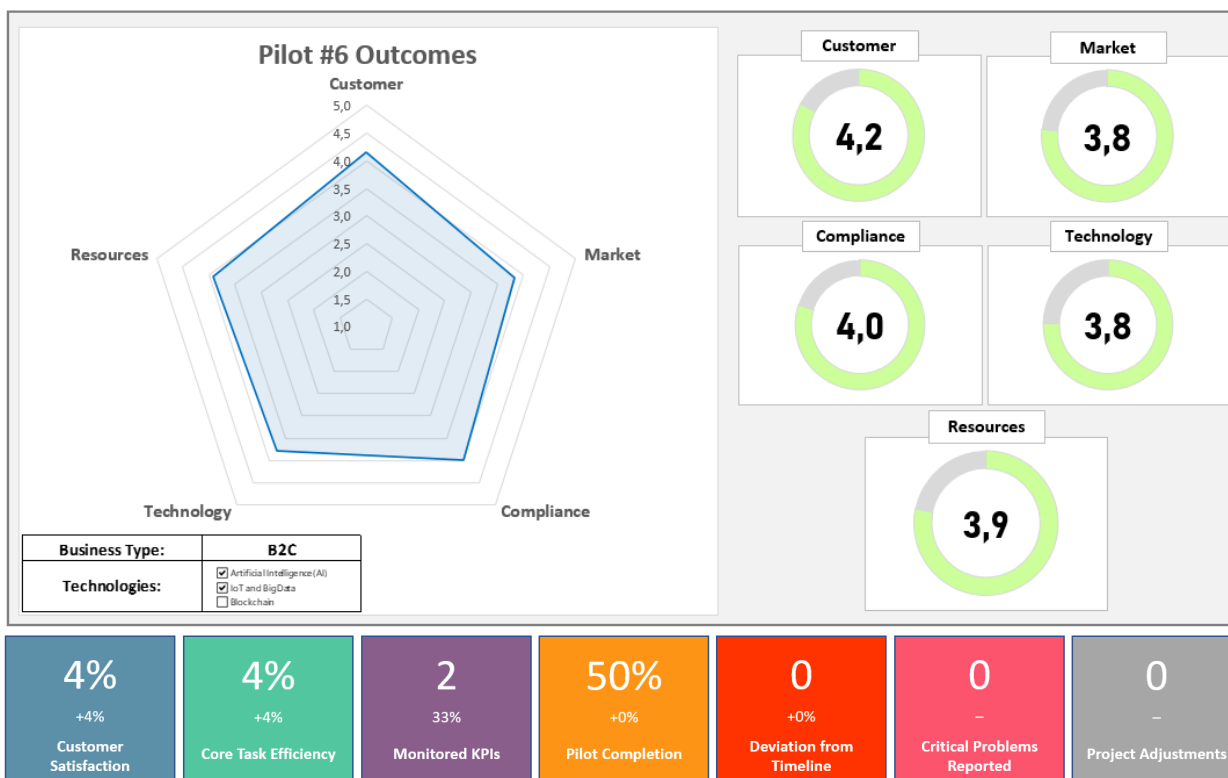


Figure 16 Pilot #6 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- **Highly Innovative:** the solution offers a service that aims at creating a personalized investment recommendations which is available not only for the highly affluent, but also for all Retail Customers. BigData and AI systems can revolutionize personalized portfolio management and customer behavior analytics, through improving and automating investment recommendations for retail customers for Banks & FIs. The proposed recommendations will be based not only on the instruments available from the bank, but also to the necessary input data for sentiment analysis for each financial instrument, based on the news & social feed, for the specific instrument (e.g., stock,

bond, etc), or the relative instrument category. The algorithm – available to financial advisors – not only examines each Customer's transactional activity but takes also into account similarities and patterns among Customers, bringing innovation both business-wise and technology-wise:

- Business Innovation:
 - Democratization of information
 - Introduction of business KPIs to become more effective and efficient, approaching the operational excellence model
 - Detailed level of information regarding investment recommendations
 - Recommendation engine considering also Real-Time information.
- Technical Innovation:
 - Real-Time Big Data usage
 - Easily comprehensible visualization
 - Data harmonization
 - Open-source *Machine Learning* (ML) libraries integration
- **Potentially Good Market Position:** the proposed solution has what it takes to outclass the competitors' existing implementations, as it reportedly combines customer's ability, potential and risk appetite. Indeed, it provides the financial advisors with a holistic view regarding the investment status of each customer, supporting customer satisfaction and operational efficiency.
- **Better Performance Supporting Organizations:** the deployment of the solution – based on BigData/AI technology – will improve the performance of the customer risk profiling and investment recommendation algorithms. On that note, based on the outcomes, and following the usage of more and updated data from Bank's clients, it will be possible to train the algorithm as to provide the best expected results.
- **Foreseeable increase of Customer Satisfaction and Loyalty:** investment advisors' productivity will increase due to the higher quality of recommendations, whilst in parallel advisors will become more trustworthy and built strong customer relationships.

Find below the status of the Pilot's KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency (common-KPI)	O	% increase of acceptance of the clientele propositions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	4%	n.d.	NO
User Satisfaction (common-KPI)	B	Questionnaires sent to targeted clientele segments	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	3,83	n.d.	NO
Increase efficiency by allocating resources properly	O	Measure number of RMs used for Personalized Investments	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
Increase effectiveness through prioritization based on expected Customer Investment	O	Measure and/or project the % net profit for recommendations provided utilizing Pilot's technologies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
Set appropriate targets based on existing Customer portfolio and potentials	B	Calculate % increase of portfolio improvement for Customer portfolio and potentials	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
Make more targeted proposals to Customers and increase sales and Csat	B	Measure % difference of effectiveness for a) Customers' targeted proposals b) Sales Volumes increase c) Customer Satisfaction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO

Figure 17 Pilot #6 KPIs Status (Part of the KPIs can be measured only after 6 months of Project's full operationalization)

Pilot #6 targets for personalized investment recommendations for the retail customers, so as to achieve the following targets:

- New, more automated investment banking processes for NBG branch network
- Investment advisors' productivity enhanced thanks to better recommendations
- Increase Customer Satisfaction and Loyalty
- Increase efficiency and effectiveness
- Identify Customer's potential

3.5.2 Lessons Learned

The various stakeholders of Pilot #6 who participated in the 1st workshop, contributed significantly with their comments and suggestions to the development and evolution of the pilot. Through the workshop, we gained the acceptance of the stakeholders for our Pilot as an important and very interesting project. In a fast-paced environment, where the competition is extremely high, a mechanism that can offer personalized proposals to each customer, based on his needs, seems to be very highly innovative.

3.6 Avoiding Financial Crime

3.6.1 Outcomes

In the latest workshop, Pilot #7 engaged with 15+ stakeholders made up of employees of CXB security department, researchers and developers of AI methods (FBK, FTS) and customer faced employees Financial Sector (FTS). From such interactions, the Pilot achieved the following results (see Figure 18):

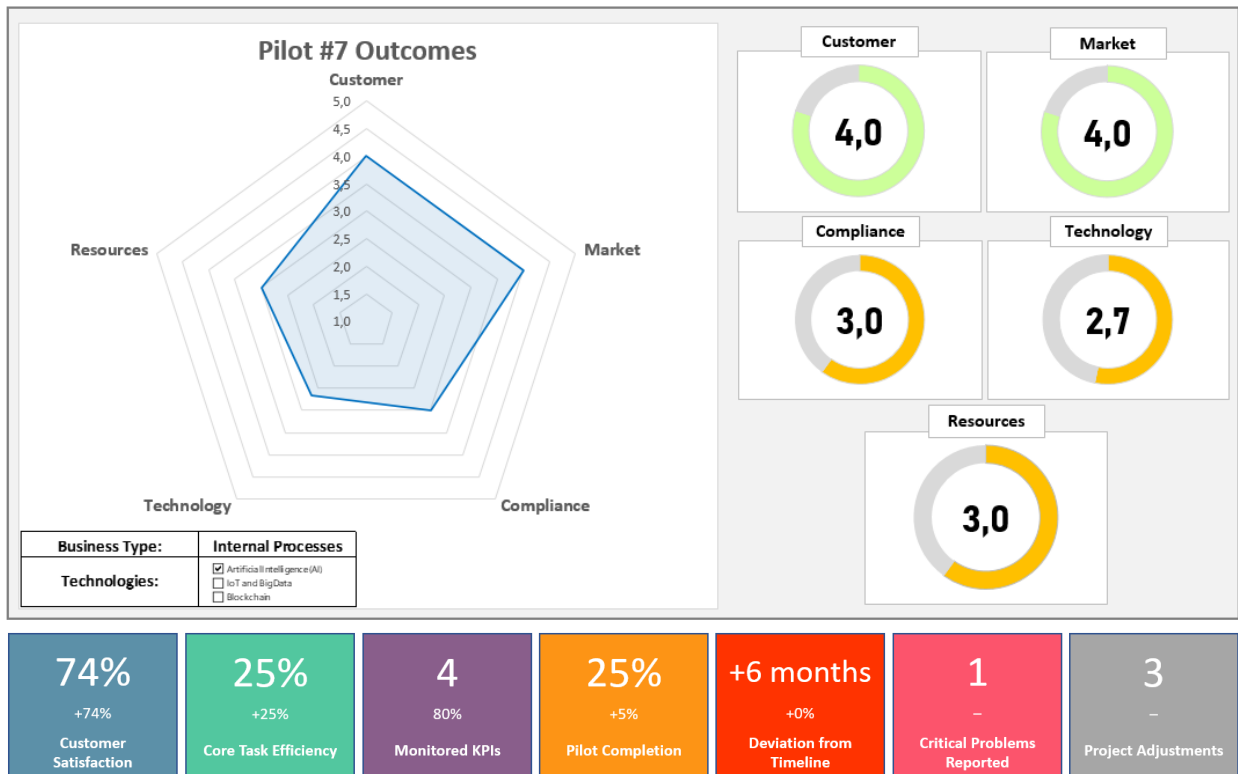


Figure 18 Pilot #7 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- Potential good Extensions in Business scenarios:** the Pilot's solution – which is under development – is very relevant. The potential extensions that are worth noting are: leasing and special banks (e.g., automotive). On top of that, bank transfers being financed by an instant loan may be a virtuous extension of the business scenario. Accordingly, it will be paramount to consider as “next steps” the Data Privacy and Data Governance for such extended scenarios. Yet, the current approach meets the expectations in an important problem for the industry.
- Innovative system:** the Pilot is working on an innovative system, whose roadmap is well-defined.
- Novel approach in the market for an important issue:** the reputation of Spanish retail banking in Europe is a high benefit for market entry. The solution is highly relevant as all players who want to approve a loan need speed and security against fraud. An interesting extension would be embedded banking leveraging external data based on *Payment Service Directive II (PSD2)*, i.e., instant loans in a retailer's app and the retailer may provide a pre-analysis, which is extended by the financial services provider (bank). However, competition and state-of-the-art should be analyzed more thoroughly.
- Major Benefit – reduction of false positive:** at current state, the major benefit of the solution is the reduction of false positives and a focus on low number of cases. Especially in embedded banking the solution has the potential to simplify a pre-check, requiring only a few resources especially for hybrid service providers (e.g., Klarna and Retail).
- Accuracy to be improved:** as being under development, the Pilot shall review the data as to improve its accuracy.

- **More Clarity is needed:** the Pilot have achieved a fairly good stage when it comes to Technological Capabilities, yet some aspects are foreseen to be improved in the Pilot’s plan:
 - Provide more details on the solution’s features, common interfaces, and criteria.
 - Incorporate the INFINITECH WAY;
 - Elaborate the technology and maturity more thoroughly;
 - Performance and speed are unclear, as not yet tested on real world data.

Find below the status of the Pilot’s KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency <i>(common-KPI)</i>	O	Weighted sum of the level of achievement on KPIs (False Positive Rate, Percentage of detected frauds and Increased automation).	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0%	n.d.	25%	100%	NO
User Satisfaction <i>(common-KPI)</i>	B	User satisfaction survey	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	3,33	4,5 <small>(out of 5 on user satisfaction feedback)</small>	NO
False positive rate	O	False positive ratio: $FPR = FP / FP + TN$ FP (False Positives), TN (True Negatives)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50%	n.d.	50%	0%	NO
Percentage of detected frauds	O	%frauds detected: Number of automatically detected frauds / Number of manually detected frauds	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50%	n.d.	50%	>=100%	NO
Increased automation in fraud detection processes (time / operational cost saving)	B	[1- (Time needed to automated fraud detection / Time to manually detect fraud)] *100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.5 hours/case	n.d.	n.d.	0.5 hours	NO

Figure 19 Pilot #7 KPIs Status

The field of applying AI based algorithms to instant loans is very new to banking. Common KPIs are not yet established. Thus, the KPIs have been developed based on requests by users in CXB’s fraud analysis team. For this reason, the KPI’s are favorable to INFINITECH’s KPI’s based on the fact that have been defined specifically for a personalized solution in a particular use case which has not been done for commercial tools.

3.6.2 Lessons Learned

In general, the feedback shows a broad applicability of the Pilot #7 beyond the specific problem especially in embedded banking applications. For leveraging this potential, a more detailed view on the specific features and their contribution to the model shall facilitate a generalization as other banks and application areas in payment services or leasing will require adaptation on the model level. The Pilot #7 thus may be just a first step in a not yet completely opened area of analytics in banking. In a first step a more elaborated description of the technology shall provide more insights.

Another important lesson learnt is that confidentiality of data is crucial in this case because AI solutions needs almost real data and although GDPR is making an exception for the usage of personal data when protecting the client from fraud, this exception is not applicable if the usage of personal data is in the innovation or development phase, for this reason in this project we have dedicated a lot of efforts to determine which way is the best to extract data that can be used to build AI algorithms without personal and sensitive information. In our case we have seen that the usage of synthetic data is a feasible way to accomplish it. The problem is that normally synthetic data has not valid information to work with AI or Data Analytics tools as synthetic data follows only patterns and losses important relationships to apply AI. In our case we have tried the tools Mostly.ai which provides intelligent synthetics data using AI too, to

build a recipe of synthetic data that can also be used to apply AI to the outcome. The results have been very promising in Pilot #7 and seems to be a valid way to work with restricted data outside the organization respecting the GDPR limitations.

3.7 Platform for Anti Money Laundering Supervision (PAMLS)

3.7.1 Outcomes

In the latest workshops, Pilot #8 engaged with 47 stakeholders including the Slovenian Securities Market Agency, Slovenian Financial Intelligence Unit (FIU), AML supervisors, BOS project council and other BOS departments. From such interactions, the Pilot achieved the following results (see Figure 20):

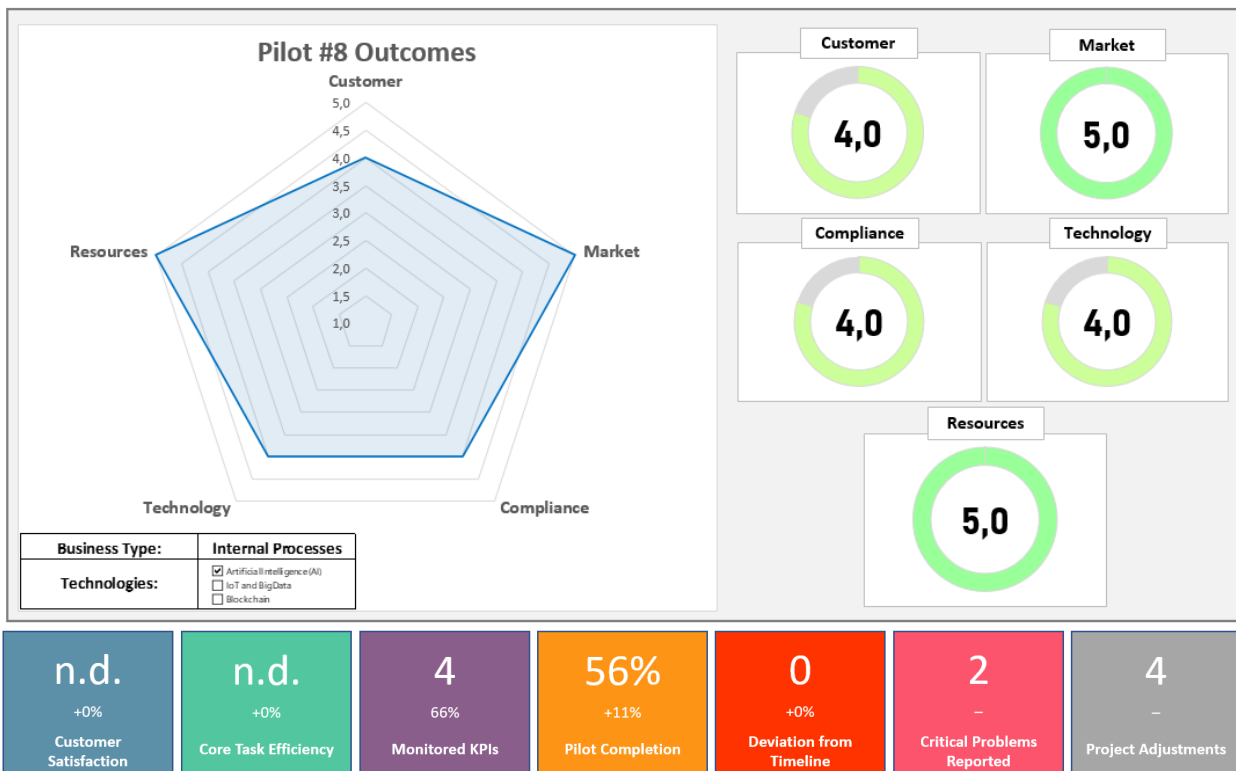


Figure 20 Pilot #8 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- **Functional and Innovative solution:** the end-users tested the use of the Pilot’s Risk Assessment tool and completed the questionnaire to assess the level of Utility and Added Value. The outcomes highlighted positive feedback, with a somewhat high rating of usefulness and the degree of innovation. Notably, the participants in the workshops (i.e., AML supervisors, IT and legal experts) expressed the view that the Pilot’s solution is highly innovative and useful and should be made available to any AML supervisor.
- **Hosts newly developed AI approaches and methods:** from the technology perspective, the presented solution is a mixture of innovative use of Data Science approaches and technology already proven in similar domains, and newly developed AI approaches and methods. Key metrics of successful technology implementation are:

- validation of proposed functionalities (currently in the process of actual validation);
 - robustness of implemented solution;
 - actual usefulness of the solution (the workshops held revealed that this metric is achieved).
- **High levels of scalability:** the “INFINITECH WAY” of development and deployment provides the necessary capacities for increased interoperability and scalability.
 - **Promising results:** test usages have shown promising results, in terms of both speed and actual performance metrics (functionality verification). The Pilot is currently in the process of testing the proposed solution of Screening Tool in an operational environment. Further tests will allow the Pilot to provide more information regarding the actual performance metrics.
 - **Constructive feedback for improvements:** some suggestions for improvement have been submitted by the stakeholders. These are related to: methodology update, functionality of the tool and its *Graphical User Interface* (GUI).
 - **Human error and Time Reduction achievements:** in the context of the Pilot’s Risk Assessment tool, the system has achieved the KPIs regarding the time and effort for supervisory planning (≥ 50% ManDay), and the decrease of human error possibility (≥ 60%).

Find below the status of the Pilot’s KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency: <i>(common-KPI)</i>	□	Functionalities tested on production data and comparison of current process vs. PAMLS process.								
		Number of hours spent for risk assessment.	□	□	☑	□	n.d.	n.d.	n.d.	NO
		Number of data analyzed. Time spent for data analysis.								
User Satisfaction <i>(common-KPI)</i>	B	Questionnaire to AML analysts to evaluate the user experience within PAMLS (per functionality).	□	□	☑	□	n.d.	n.d.	n.d.	NO
Decrease possibility of human error ≥ 60%	□	Evaluation of current manual process vs. PAMLS automated process and controls Number of manual tasks for: - data gathering (distribution channel), - data quality (automatically checked), - risk assessment (automated), - reassessment (automated).	☑	☑	□	☑	20%	60%	60%	YES
Increase the quality in the data analysis (discovery of patterns with additional data sources)	□	Evaluation of existing data sources and number cases identified vs. number of cases identified via PAMLS big data analysis through data sources used. Number of data sources for data analysis. Number of cases identified.	☑	☑	□	☑	0%	0%	30%	NO
Decrease time and effort for supervisory planning (measurable in man/day)	B	Evaluation of time spent in current supervisory process vs. time spent for the supervisory process with support of PAMLS. Man Day spent for risk assessment: - data gathering, - data quality, - risk assessment, - reassessment.	☑	☑	□	☑	37MD	13 MD	18,5MD	YES
Increase the quality of supervisory planning	B	Evaluation of the number of factors and data sources taken into account for supervisory planning now vs. the number of factors and data sources taken into account for supervisory planning using PLAMS tools. Number of data sources for risk assessment. Number of risk factors evaluated.	☑	☑	□	☑	0%	10%	50%	NO

Figure 21 Pilot #8 KPIs Status

3.7.2 Lessons Learned

Pilot development takes place in close cooperation between the data provider and the end user (BOS) and technical partner (JSI). To assure an agile approach, regular meetings and workshops with different stakeholders (project team members, supervisors, IT, legal and compliance, technical partner, other experts) were organized. The aforementioned approach has proven to be effective in detecting and addressing identified issues and challenges.

One of the main challenges was data quality. Several iterations were required to prepare data of required quality that were further enriched and pseudo-anonymized. During the data preparation a list of data preparation rules was created.

Due to complex legal and compliance requirements, experts from Legal and Compliance departments are included in the project team, to ensure that the development of the Pilot is carried out in accordance with legal and ethical requirements.

3.8 Analyzing Blockchain Transaction Graphs for Fraudulent Activities

3.8.1 Outcomes

In the latest workshop, Pilot #9 engaged with 3 stakeholders made up of two employees from Central Bank of Turkey and one employee from Aktif Bank. From such interactions, the Pilot achieved the following results (see Figure 22):

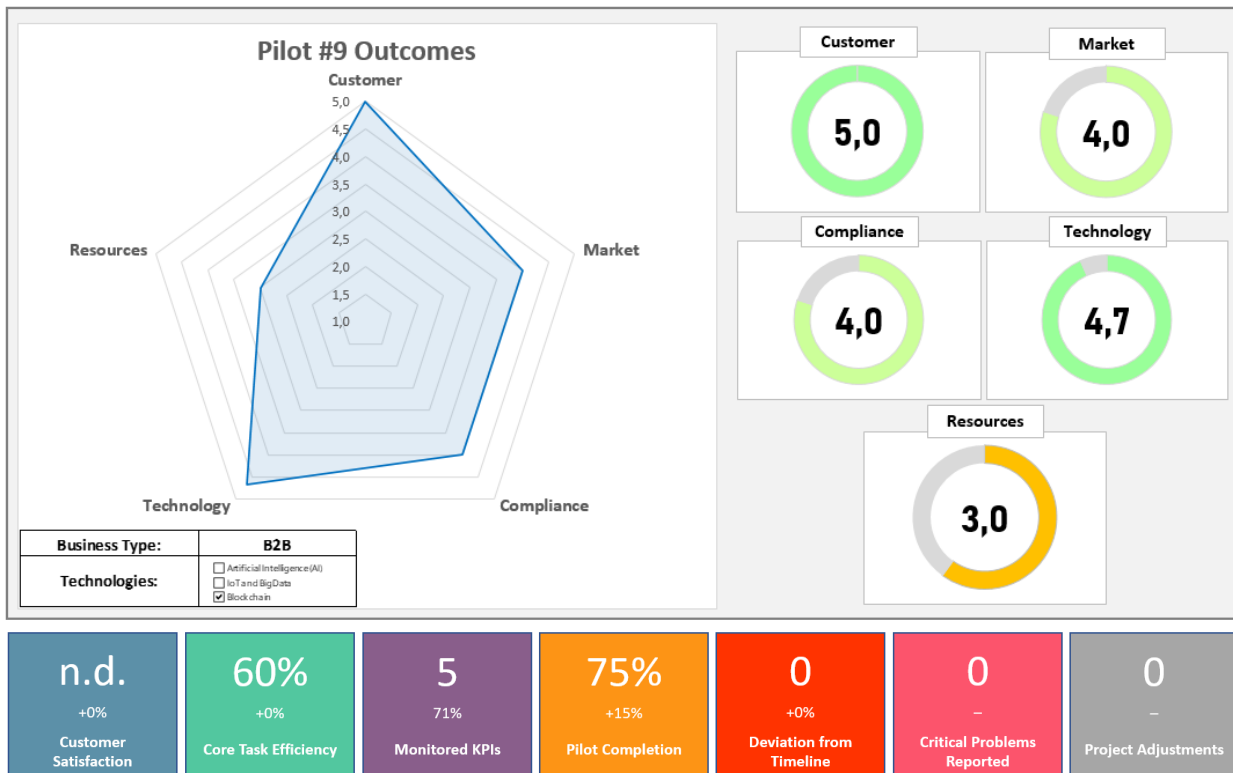


Figure 22 Pilot #9 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- **High Degree of Innovation:** Blockchain transaction throughputs are increasing and are expected to grow to thousands per second. New proof-of-stake based blockchains will also have thousands of transaction throughputs, requiring scalable automated computational based systems to be used for their analysis. Scalability by using parallel High Performance Computing (HPC) technologies is one of the innovations of Pilot #9. Ability to support tokens on enterprise blockchains, for example, Hyperledger Fabric, is also another innovation of Pilot #9.
- **High Level of Scalability and Automation:** Since new generation of public blockchains are expected to grow to thousands of transactions per second, a service that is scalable and less human-intensive is needed. Pilot #9 builds on automated High Performance Computing (HPC) tools and advanced parallel algorithms, which enables the system to be scalable and sustainable.
- **Increased Core Task Efficiency:** Pilot #9 system is able to analyze the complete transaction graph by partitioning it among HPC cluster nodes. This results in an efficient solution (as shown in the KPI table and already illustrated in D7.20).
- **Dynamic Context:** Blockchain technologies are relatively new and have been dynamically evolving during the last decade. Due to the current worldwide interest in the blockchain technologies and its disruptive effects, it is expected that the market for blockchain transaction analysis services will draw more attention. It is also expected that a market for fraudulent activity tracing on Central Bank Digital Currencies (CBDC) will be developed on the governmental agencies in addition to banks, exchanges and other financial institutions.
- **New Regulations:** Since blockchain technologies are relatively new, regulations have not matured and are actively evolving. Financial Action Task Force's (FATF) guidance [3] states that "Virtual Asset Service Providers (VASPs) be regulated for anti-money laundering and combating the financing of terrorism (AML/CFT) purposes, licensed or registered, and subject to effective systems for monitoring or supervision". This provides further evidence that Pilot #9 system can have use in implementation of effective systems for monitoring or supervision that will be required by regulators.
- **Other Potential Uses:** Pilot #9 system is developed for analyzing blockchain transactions. The idea of representing blockchain transactions as a transaction graph can also be applied to tracing other types of transactions. For example, the system can also be used for tracing IBAN transactions or CBDC.

Find below the status of the Pilot's KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency (common-KPI)	O	Ability to do fraudulent analysis on Bitcoin and Ethereum blockchain data within similar (or slowly growing) time frames provided the number of nodes in the HPC cluster will be increased	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	60%	n.d.	n.d.	NO
User Satisfaction (common-KPI)	B	User satisfaction survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
Sizes of the transaction graph extracted from blockchain data, partitioned and stored on disk (A)	O	Number of Transactions and addresses.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	Bitcoin: 625 M transactions and 800 M addresses Ethereum: 766 M transactions and 78M addresses	Bitcoin: 694 M transactions and 914 M addresses Ethereum: 1553 M transactions and 147 M addresses	n.d.	YES
Loading and construction times of partitioned transaction graphs (B)	O	Time to load and construct graph	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	Bitcoin: 1910 sec Ethereum: 219 sec	Bitcoin: 3110 sec Ethereum: 619 sec	n.d.	YES
Scalability: how running times of the graph algorithms grow as the number of nodes and/or the size of blockchain increases (C)	O	Parallel Running Time / Sequential Running time (as the transaction size is increased)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	Bitcoin: 1,94x speedup for graph construction, 16x speedup for pagerank, 41x	Bitcoin: 1,5x speedup for graph construction, 19x speedup for	n.d.	YES
Response time of queries (D)	O	Blacklisted address to user address trace query time.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	few seconds	few seconds	n.d.	YES
Increased automation in fraudulent activity tracing processes (operational cost saving) (E)	B	[1-(Time needed to trace fraudulent transactions using transaction graph analysis system / Time needed to manually trace fraudulent transactions on public blockchain explorers)] *100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO

Figure 23 Pilot #9 KPIs Status

KPIs of the Pilot are mainly related to the system's performance and scalability. This is very important because the number of transactions will grow drastically in the near future because of newer technologies in blockchain. Scalability is required for the system to be sustainable. Blockchain transaction analysis sector is new. Therefore, there are no published state-of-the-art KPIs. We provided a feature comparison table with the competitor companies in D9.13.

3.8.2 Lessons Learned

Stakeholders in the Pilot #9's workshop were from the Central Bank of Turkey. They were interested in Pilot #9 since they were also researching the use of CBDC. They found Pilot #9's solution highly innovative. They provided positive feedback on usage of HPC tools. They recommended that the user-friendliness of the system is important. They also suggested that such a system should be easy to use and maintain.

3.9 Real-time cybersecurity analytics on Financial Transactions' BigData

3.9.1 Outcomes

In the latest workshop, Pilot #10 engaged with 4 stakeholders comprised of the ENG team (involved in INFINITECH), ENG' responsible for the Distributed Ledger & Fintech research area. From such interactions, the Pilot achieved the following results (see Figure 24):

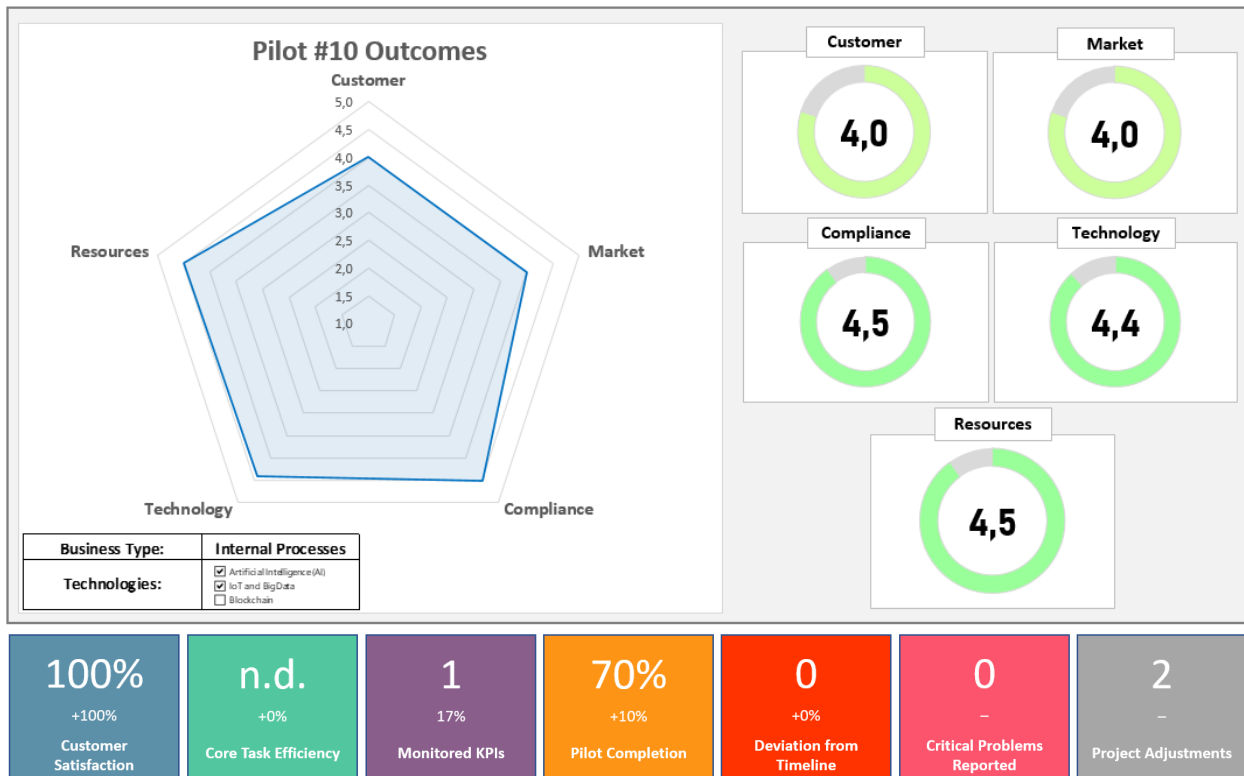


Figure 24 Pilot #10 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- **High levels of Technological capabilities:** From a technological perspective the fraud detection system proposed was convincing since it is mainly designed and developed on top of a Data Science and Machine Learning platform based on advanced frameworks and open-source technologies for design, deployment, execution, and monitoring of big data analytics workflows (both stream and batch). It is a research asset by ENG coming from past and ongoing research activities.
- **Needs more refinements to achieve full potential:** The fraud detection system proposed is based on ML training and prediction by means of synthetic data processing. This point was considered a weakness considered that added value and degree of innovation are to be evaluated. Indeed, actual degree of innovation can be assessed only with real data processing.
- **High levels of scalability and Integration:** the proposed solution is built referencing to a cloud-based architecture able to scale computing and storage resources thanks to a workflow orchestration engine that leverages the capabilities of Kubernetes for cloud resource management. This element was considered as a good characteristic to support integration and scalability.
- **Compliance:** the fraud detection system under development is designed by considering the banking data sovereignty. Such prototype will be released to be integrated on premise so to keep all the existing internal procedures and avoid the external data processing.
- **Market saturation, competition and positioning analysis to be improved:** the group interviewed is not in depth aware of the market perspective. Hence, the group agreed to adopt 'good' as

average value. Of course, a thorough market analysis needs to be done and a panel of experts needs to be interviewed in order to better understand the potentials of the Pilot’s solution.

Find below the status of the Pilot’s KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency (common-KPI)	O	Calculate difference Δ between average cost of operations and estimated cost of operations with the ML-based Fraud detection system implemented	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	Δ > 0	NO
User Satisfaction (common-KPI)	B	Collect end-users’ feedbacks by surveys and calculate the average M1 of all scores assigned by users	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	4	M1 >= 4 M1 ranging from 0 to 5	YES
Number of frauds detected >= 5	O	Collect number of frauds F detected with the ML-based Fraud detection system implemented that were not recognized by rule-base engine	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	F >= 5	NO
False positives rate <= 20%	O	Collect number Fp of false positives wrongly identified by the ML-based Fraud detection system implemented	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	Fp <= 20%	NO
Increased automation in fraud detection processes	B	Calculate difference Δ2 between overall cost (weight) of operations with and without the ML-based Fraud detection system implemented	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	Δ2 > 0	NO
Availability of graphical tools for more efficient and effective transaction analysis	B	Calculate the average M2 of all scores assigned by users	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	M2 >= 8 M2 ranging from 0 to 10	NO

Figure 25 Pilot #10 KPIs Status

Apart from user satisfaction, the KPIs identified were not measured yet. They are about to be used for the next end-to-end execution test of the overall system, due by next April. We envisage their full achievement.

3.9.2 Lessons Learned

The team involved in the ENG’s Distributed Ledger & Fintech research area had significantly contributed with his comments and suggestions to what resulted to be the first version of the ML-based fraud detection system and, in this process, we witnessed a homogenization of expectations; at the same time the team agreed on the need to envisage a final testing plan through the adoption of a significant e reliable transaction data set properly anonymized to be used to validate the ML models trained and the overall system.

3.10 Personalized insurance products based on IoT connected vehicles

3.10.1 Outcomes

In the latest workshop, Pilot #11 engaged with 23 stakeholders comprised of insurance companies, tech-companies, consulting companies and researchers. From such interactions, the Pilot achieved the following results (see Figure 26):

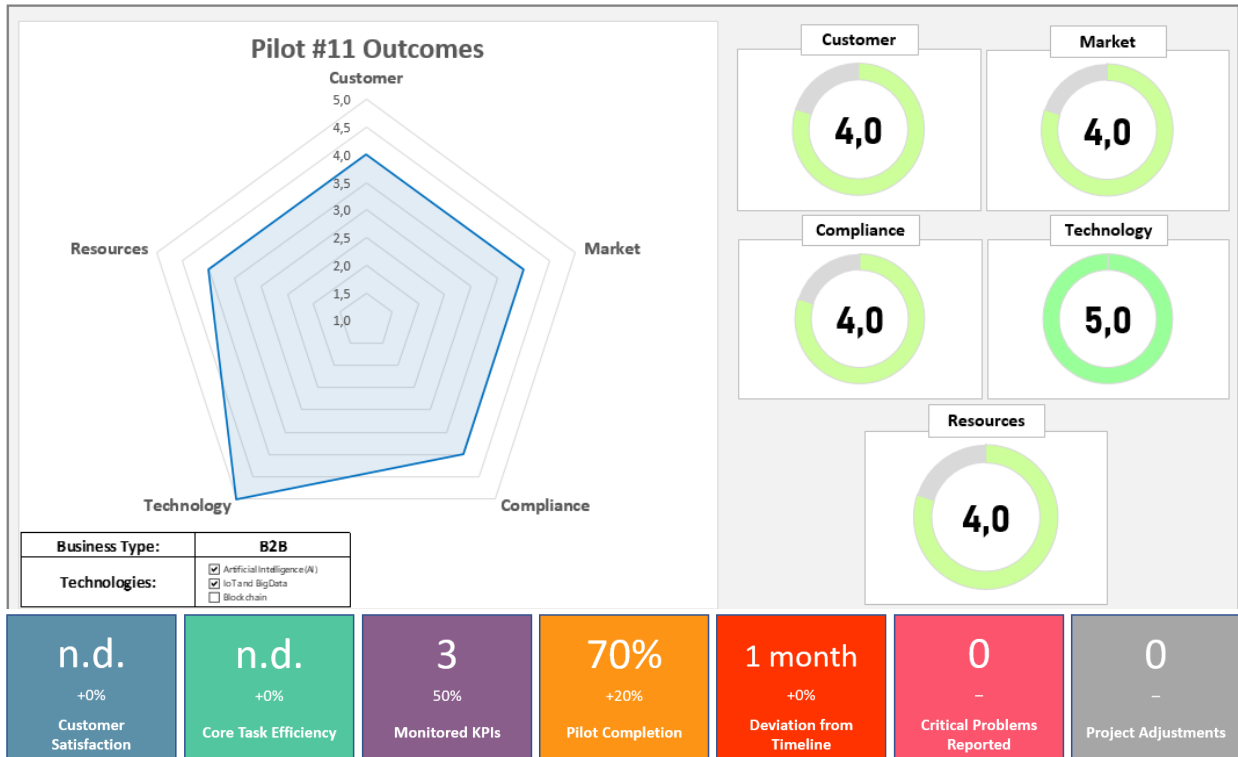


Figure 26 Pilot #11 Outcomes: INFINITECH Innovation Pentagon and additional metrics

As stated in D7.13 Pilot #11 is led by ATOS and it is focused on the improvement of car insurance services applying cutting-edge technologies such as Artificial Intelligence A(I), IoT and Big Data. In the Pilot’s framework (Atos’ SmartFleet), connected vehicles datasets are captured, homogenized, and stored. These datasets are provided by CTAG. Furthermore, other datasets coming from other related sources such as weather, traffic alerts and road information, are incorporated. An AI powered model that combines and exploits these mentioned sources is developed for driving profiling. The outcomes of the model will serve as the basis for two end user services: Pay as you drive and Fraud detection. This approach and the first version of this AI model for driving profiling were presented in a workshop to insurance stakeholders (see Annex A for more details).

Main parameters that contribute to the scores:

- **High level of Technological satisfaction:** during the stakeholder workshop the technologies to capture real world datasets from vehicles and involved context information (weather, alerts, etc.), as well as the AI modeling to profile drivers, were highlighted and appreciated by the stakeholders.
- **Positive feedback regarding data:** from the direct output ATOS have found out that more accurate data from the drivers is useful to calculate premiums and the stakeholders positively valued the use of this data to evaluate responsibilities in the case of an accidents.

Find below the status of the Pilot’s KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency (common-KPI)	O/B	Average the accuracies obtained for each defined driving profile	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	>70%	NO
User Satisfaction (common-KPI)	B	Compare Driving Profiling model outcomes with current classification of the provided routes (from insurance company and/or testing environment)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	>70%	NO
Volume (number) of routes captured/evaluated (Set of attributes captured; real vehicles measurements; traffic alerts measured)	O	List all the aggregated routes for testing/training the AI model	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	60	60	>10k	NO
Number of Driving profiles identified and defined	O	Identify and detail the clusters derived from the AI analysis	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	4 clusters (pre-driving profiles)	4 clusters (pre-driving profiles)	>5	NO
Number of new products/services offered by the Insurance Company	B	List all novel services/apps developed exploiting Pay as You Drive and/or Fraud detection	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0	0	0	>=2	NO
Accuracy of Driver's (insured clients) classification	B	Compare Driving Profiling model outcomes with current classification of the provided routes (from insurance company and/or testing environment)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	> 75% per each profile	NO

Figure 27 Pilot #11 KPIs Status

3.10.2 Lessons Learned

The outputs of the workshop have shown the stakeholders' acceptance and willingness to use and promote the proposed Pilot's tools to capture information from vehicles and context, plus the usefulness of the profiling model. An open point is the definition of real products for end users that reuse the outputs of the models and captured information, in other words how the policy premium calculation will consider the driver profiling to increase or decrease the policy's price (final implementations of fraud detection and payment).

3.11 Real World Data for Novel Health-Insurance products

3.11.1 Outcomes

In the latest workshop, Pilot #12 engaged with 23 stakeholders comprised of insurance companies, tech-companies, consulting companies and researchers. From such interactions, the Pilot achieved the following results (see Figure 28):

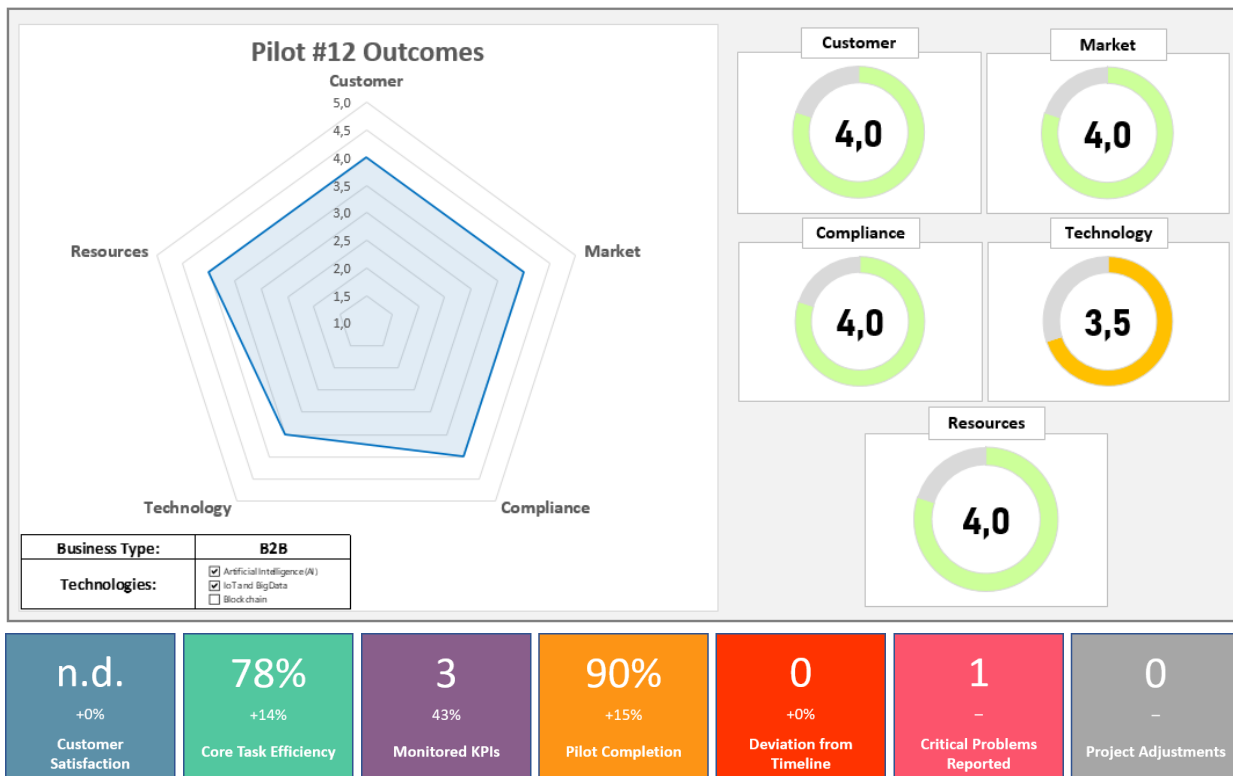


Figure 28 Pilot #12 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Pilot #12 addresses the use of risk assessment models in personalized health insurance products. Insurance professionals assess their customers based on analytics on their continuous behavior, assisted by the outcomes of the automated risk assessment.

The following are the main parameters that contributed to achieve the scores:

- **Well-received idea and implementation:** During the stakeholders’ workshop, participants were exposed to the way well-being risk assessment models can be introduced in health insurance products. The idea and the implementation were well-received, as indicated by the high related scores.
- **Readiness needs improvements:** Concerns were raised due to the fact that the final risk model is not yet developed (a study is being run to collect the necessary data) and hence the technology readiness score given is somewhat lower.

Find below the status of the Pilot’s KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency (common-KPI)	O/B	Average of the percentages in the two operational pilot-specific KPIs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n.d.	44,65%	58,75%	75%	NO
User Satisfaction (common-KPI)	B	Weighted average of the percentages in the three business pilot-specific KPIs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	60%	NO
At least 75% of the clients complete more than 85% of all triggered questionnaires forwarded to them in the past 2 months	O	Objectively determined by the data collected at Healthentia	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n.d.	46,40%	83,02%	75%	YES
At least 75% of the clients wear their sensors to provide the automatic measurements for at least 6 out of 7 days in each of the past 2 months	O	Objectively determined by the data collected at Healthentia	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n.d.	42,90%	34,48%	75%	NO
At least 75% of the clients are satisfied with the mobile app after 2 months of use	B	Subjectively reported by the clients in a survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	75%	NO
Upon completing the 2nd month of their usage of the mobile app, at least 50% of the clients are willing to keep using it in the long run	B	Subjectively reported by the clients in a survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	50%	NO
The health insurance professionals can confidently determine insurance premiums (increase, decrease or stay) monthly for at least 50% of the clients	B	Subjectively reported by the health insurance professional	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	50%	NO

Figure 29 Pilot #12 KPIs Status

3.11.2 Lessons Learned

The workshop has provided a first level of stakeholders’ acceptance for the business case of ML-assisted personalized health insurance. It has also highlighted that the next step is indeed the training and validation of a risk assessment model that can be applied out of the box, to be updated with future training.

3.12 Alternative/automated insurance risk selection - product recommendation for SME

3.12.1 Outcomes

In the latest workshop, Pilot #13 engaged with 23 stakeholders comprised of insurance companies, tech-companies, consulting companies, researchers, Managing General Agent (MGA), banks and reinsurance companies. From such interactions, the Pilot achieved the following results (see Figure 30):

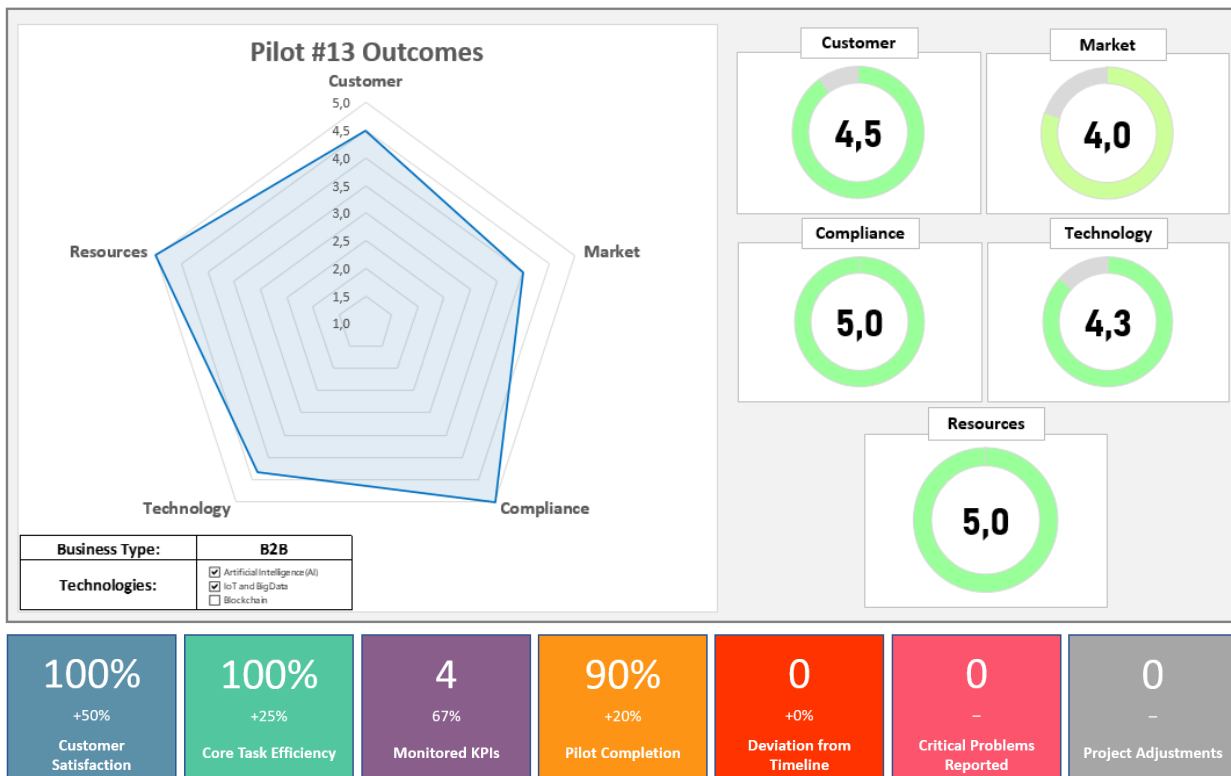


Figure 30 Pilot #13 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- **The approach meets relevant issues in a relevant problem of the industry:** eight out of nine respondents rate the service provided by the Pilot as excellent or very relevant to meeting stakeholder needs.
- **Brings Innovation within an Unsaturated Market:** the degree of innovation found by stakeholders is very relevant as the Pilot's solution is considered as an essential service – for which they will not strive to develop it internally. Moreover, the level of competition turns out to be low. Indeed, it is low mainly in U.S. companies, whereas in Europe the competition is almost nonexistent. Hence, the competitive advantages are strong and durable in the long term. However, the positioning should be improved since the Pilot's solution has been in the market for a short time.
- **Coherent with the compliance constraints:** the services contained and developed in the Pilot comply with applicable regulations in the banking and insurance sectors. In fact, demos and projects have already been carried out and have had to be approved beforehand by the compliance departments of the insurance companies and other stakeholders.
- **Significant impact on Automation and greater Scalability:** the Pilot managed to reduce the time for data acquisition to the extent of being as close as possible to real time. This would reflect into a significant impact on the process automation service delivery, and it would allow for greater scalability.
- **Seamless Connectivity / Integration:** an interesting key factor that brings an additional value to the Pilot's service performance is that the implementation of the platform does not require

integration with the insurer's systems. This is a paramount advantage given the insurers' connectivity issues between external platforms and legacy IT.

- **Positive Impact on business:** all stakeholders interviewed have shown their interest in the Pilot and its positive impact on different aspects, such as an increasing in sales and customer experience thanks to the automation of processes, improvement in customer knowledge and reduction of portfolio risks via updating data, and the prediction of insurance needs of companies through the "product recommender".

Find below the status of the Pilot's KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency (common-KPI)	O	Average of the number of targets founds and density of information	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	40%	50%	75%	72,5%	YES
User Satisfaction: number of errors corrected in data base (common-KPI)	B	Comparing original and new found information in the data base	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	50%	30%	YES
Percentage of SMEs relevant information found in external sources used	O	Number of targets with information found versus no information found	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	50%	60%	85%	85%	YES
Density of the information found in each of the SMEs	O	Information found in each of the areas into which the data map is divided.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30%	40%	60%	60%	YES
Percentage of fields found for automated company insurance issuance	B	Percentage of fields that can be filled in or obtained automatically from the sources without human intervention	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	30%	50%	60%	90%	NO
Level of usage (from employees or system integrators)	B	Number of users who use the system in relation to the total number of potential users of an insurer.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10%	20%	30%	60%	NO

Figure 31 Pilot #13 KPIs Status

The state-of-the-art in comparison to the KPIs listed in the table above can be summarized in three main points:

- Errors corrected: Currently the insurance industry is not implementing a policy of correcting errors in corporate client data nor is it updating its data on an annual basis.
- SMEs data found in external databases: The average for the sector is very low, barely 10%.
- Density of information found: The level of information found and automated in the case of insurers is on average 17%.

3.12.2 Lessons Learned

The activities carried out based on the collection of comments and opinions by Pilot #13 regarding stakeholders have been done through a workshop and the completion of online questionnaires. The online questionnaires had to be carried out as the organized workshop was not sufficiently attended and we considered the reinforcement of feedback through the questionnaires.

Therefore, one of the lessons learned is that mass workshops involving different Pilots, even if they are insurance Pilots, are not effective. This is because, given the stage of maturity of the project, we believe that it is more effective for each Pilot to seek personalized feedback from the stakeholders who can contribute most to the project. Stakeholders, for example from an insurance company, are very different whether we are talking about business, agriculture, auto or health insurance.

That said, the feedback we got was very interesting and enriching as it proved that Pilot #13 is considered a high priority by the stakeholders, immediately applicable and highly innovative both technologically and business-wise.

3.13 Big Data and IoT for the Agricultural Insurance Industry

3.13.1 Outcomes

In the latest workshop, Pilot #14 engaged with roughly 50 stakeholders comprised of insurance companies that are currently active at providing Agriculture Insurance or interested to complement their portfolio with Agriculture Insurance products. From such interactions, the Pilot achieved the following results (see Figure 32):

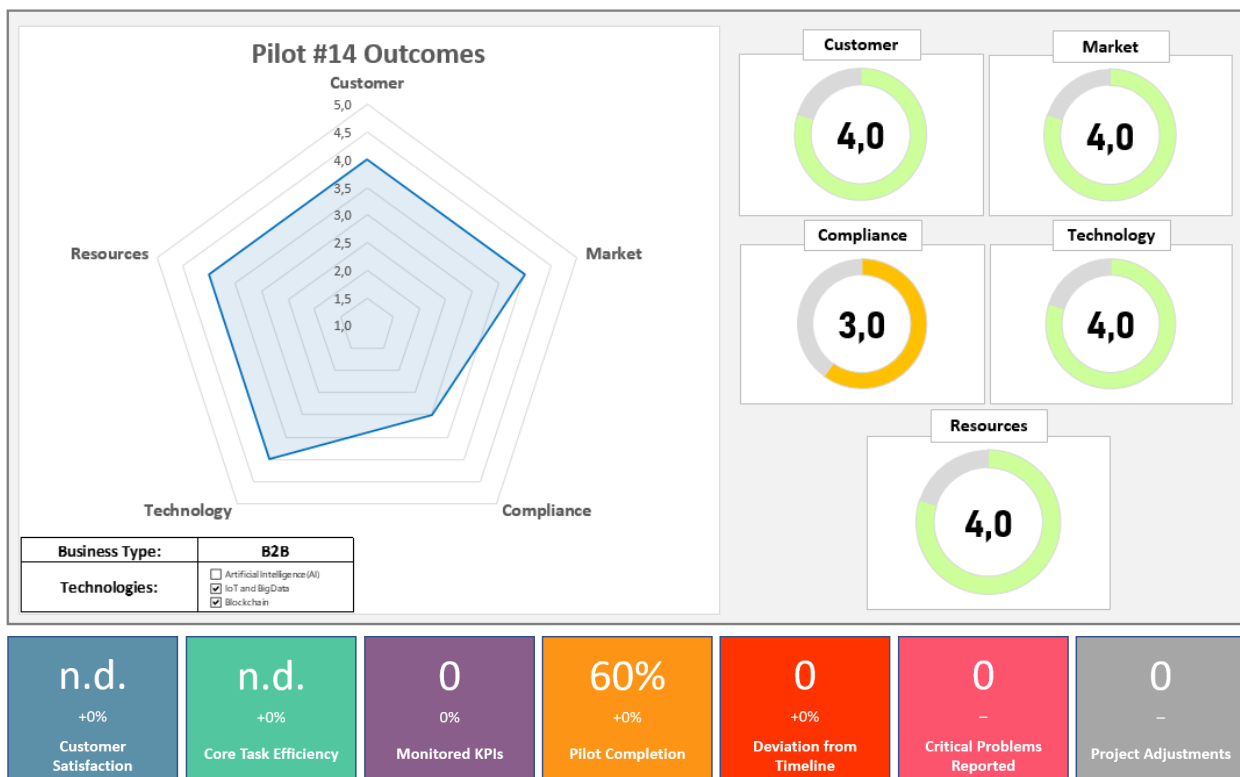


Figure 32 Pilot #14 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- Increase of Efficiency and Accuracy for the Agricultural Insurance’s business:** the Pilot’s solution (INFINITECH Agricultural Insurance toolbox - AgI) is delivering increased efficiency in the three main procedures in agricultural insurance: *underwriting*, *damage assessment* and *contract monitoring*. Information on weather risk probability has the potential to improve underwriting via integration in premium calculation procedure. It can also be employed for early work planning, communication of early warning to farmers to mitigate or avoid damages and for the assessment of potential level of compensations. Probabilities for short term (within the insurance period which is usually one year) but also in a longer term for the following perils: Drought, Heavy/Extensive rainfalls, Floods Temperature: frost and heatwaves, Snow, Hail, Fire, Pest, and various diseases. Information on the occurrence of extreme events and remote damage assessment can be

exploited for: planning of field activities (e.g., field checks), checking/controlling damage handling bias, final damage assessment. Furthermore, the migration of their intelligence engine to NOVA infrastructure and Kubernetes cluster, enables the Pilot to provide more accurate and detail weather information services. This upscaled capability addresses the main pain point of Agri-Insurance companies receiving more detail and accurate information both in terms of analyzing past-historical claims and weather information as well as better and more accurate forecasting the upcoming ones.

- **Easy-to-use integration:** the easy-to-use integration of geoinformation per field parcel strikes like a huge benefit for the business, especially for the less digitalized agricultural insurance companies in the Pilot's regions Croatia and Serbia.
- **Addresses critical points for the industry:** the provided solution meets the stakeholders' expectations and addresses pain-points of the industry.
- **High degree of Innovation:** current market alternatives represent disconnected systems either providing purely remote sensing data or weather information. In such a scenario, the Pilot's solution meets relevant pain-points and addresses issues following the current workflow of the industry actors: it supports sector specific weather and climatic analytics and enables parcel and crop specific seasonal yield forecasting and estimations.
- **Promising Market Positioning:** no existing service or suite of services in the market is comparable to the proposed solution. Indeed, at the current time of writing, none were identified by the Pilot as well as by their community. In fact, the combination of portfolio administration and monitoring with external weather and climatic analytic, integrated in one application, sounds like an innovation in the business area of agricultural insurance. Specialized data provider for parametric insurance exists, however, the embedment within a portfolio management tool is offering further automation and in-house monitoring capacity to the insurance company.
- **Strict Compliance:** current legislation schemes oblige, in some countries, in field visits of personnel to perform the damage evaluation (confirm the extent and severity of damage). Nevertheless, future legislation updates may allow the completion of the process cycle 100% remotely. Even in those cases the proposed solution can bring added value, in assisting companies to prioritize in-field inspections and perform partial payments/compensations. Its use can be seen as a disruption of existing internal underwriting procedures. Hence, the service needs to be very flexible and easily adaptable to the operative IT-system of the insurance company and should be accompanied by staff training efforts.
- **High levels of scalability:** the "INFINITECH WAY" of development and deployment provides the necessary capacities for increased interoperability and scalability. Indeed, the Pilot's solution can now be deployed for any market on an instance, following the INFINITECH WAY.
- **Service Refinements are needed for expansion:** to consider the differences in cultivation practices and crop varieties, the refinement of services and models for expanding to new markets/countries is still needed. However, it can be completed in a smaller timeframe.
- **Potential high Sectoral cost-reduction:** reportedly, achieving higher automation of underwriting and loss adjustment processes can potentially reduce sectoral costs up to 50%.

Find below the status of the Pilot's KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency: KPI1 - Premium Calculation Efficiency (common-KPI)	O	Time required to calculate premium for a new coverage/policy Vs time required through traditional calculation process	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
KPI2: User Satisfaction (common-KPI)	B	Pilot insurance companies are asked to evaluate (on a scale between 1-10 from very bad to very good) their usage satisfaction after testing the AgI tool at certain intervals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
KPI3: % of automation achieved on AgI company level (quantitative criterium)	O	Pilot insurance companies are asked to evaluate % of policy processing tasks in underwriting and claims handling that can be conducted automatically via the tool	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
KPI4: AgI Process chain-time decrease (%) (quantitative criterium)	O	Pilot insurance companies are asked to evaluate Time saving (duration per policy) in underwriting and claims handling by using the tool compared to before	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
KPI5: Number of calamities covered (drought, fire, ice, flood) (quantitative criterium)	O	Number of weather risks covered by the available datasets and analyses of the tool	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
KPI6: Increase accuracy of Risk Mapping and premium calculation for the Insurance Company (qualitative criterium)	B	Pilot insurance companies are asked to evaluate (on a scale between 1-10 from very bad to very good) their risk mapping and premium calculation capacities (risk data availability, spatial and temporal resolution) before and during using the AgI tool. In addition, G&Co as a consultant will evaluate (on a scale between 1-10 from very bad to very good) the usefulness for product development.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
KPI7: Improved alerting (Early Warnings/Weather Risk probability) send to Ins. companies and damage mitigation measures deployment (quantitative criterium)	B	(1) Pilot insurance companies are asked to evaluate % of weather alerts in comparison to experienced insurance claims; (2) % of alerts compared to actual occurrence of the forecasted events (3) Pilot insurance companies are asked to evaluate Number of alerts forwarded to the insurer's clients for mitigation actions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
KPI8: Improved damage assessment (quantitative criterium)	O	% of damage predictions after event within -20%/+20% range of loss adjuster estimations	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
KPI9: O&A Cost reduction (savings as a result of the automated process incl. Damage Assessment) (quantitative criterium)	B	Pilot insurance companies are asked to evaluate % of savings for loss adjustment costs per event	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO
KPI10: Fraud attempts or false claims mitigation number of false claims detected using EO data vs false claims detected through on-site assessment (quantitative criterium)	B	% of clients with insurance claim but no event detection.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	n.d.	n.d.	NO

Figure 33 Pilot #14 KPIs Status

- Infinitech AgI toolbox Weather Risk Probability function will increase accuracy of risk assessment by 35%*
- Infinitech AgI toolbox Crop Monitoring service will increase accuracy of portfolio exposure estimations by 35%*
- Infinitech AgI toolbox Damage Assessment Calculator service will decrease operational costs by 25%* and will improve Customer Service KPIs
- Infinitech AgI toolbox Parcel Anti-Fraud Inspector service will decrease operational costs and fraud incidents by 20%*

**Estimates are based on initial secondary data provided by AgI companies and will be confirmed once the piloting season completes.*

3.13.2 Lessons Learned

Pilot actors- AgI companies and stakeholders involved in the Insurretech workshop series, had significantly contributed with their comments and suggestions to what resulted to be the INFINITECH AgI toolbox MVP and, in this process, we witnessed a large diversification in the needs priority but at the same time a large homogenization of expectations. This is the expected outcome of involving AgI actors coming from

different enterprises (maturity of markets and sectors, different sizes, varied market outreach, significantly different portfolio of products). Weather information (past climatic and now-casting) seems to be a priority for the majority of the AgI actors compared to the use of satellite data, and this feedback is aligned to our development but also to our market analysis where the satellite data, given current regulation restrictions, are considered valuable source of information but AgI actors cannot fully exploit and assimilate them to their operations bringing cost savings, compared to weather information and data. Despite these variations and respective legislations “obstacles”, the INFINITECH AgI toolbox is being praised for its functionalities and easiness of use, enabling a holistic approach to AgI operations.

3.14 Open Inter-banking Pilot

3.14.1 Outcomes

In the latest workshop, Pilot #15 engaged with 100 stakeholders comprised of the following:

- Early adopters (representatives from the banks that are currently involved in the Pilot experimental environment)
- Other Italian Banks (employees of banks that are part of the ABI Lab Consortium community)
- ICT Partner (ICT Companies, Fintech, AI experts from many firms that are currently collaborating with banks on AI)
- Italian Association for Artificial Intelligence
- Representatives from Universities and Academia
- European Banking Federation

From such interactions, the Pilot achieved the following results (see Figure 34):

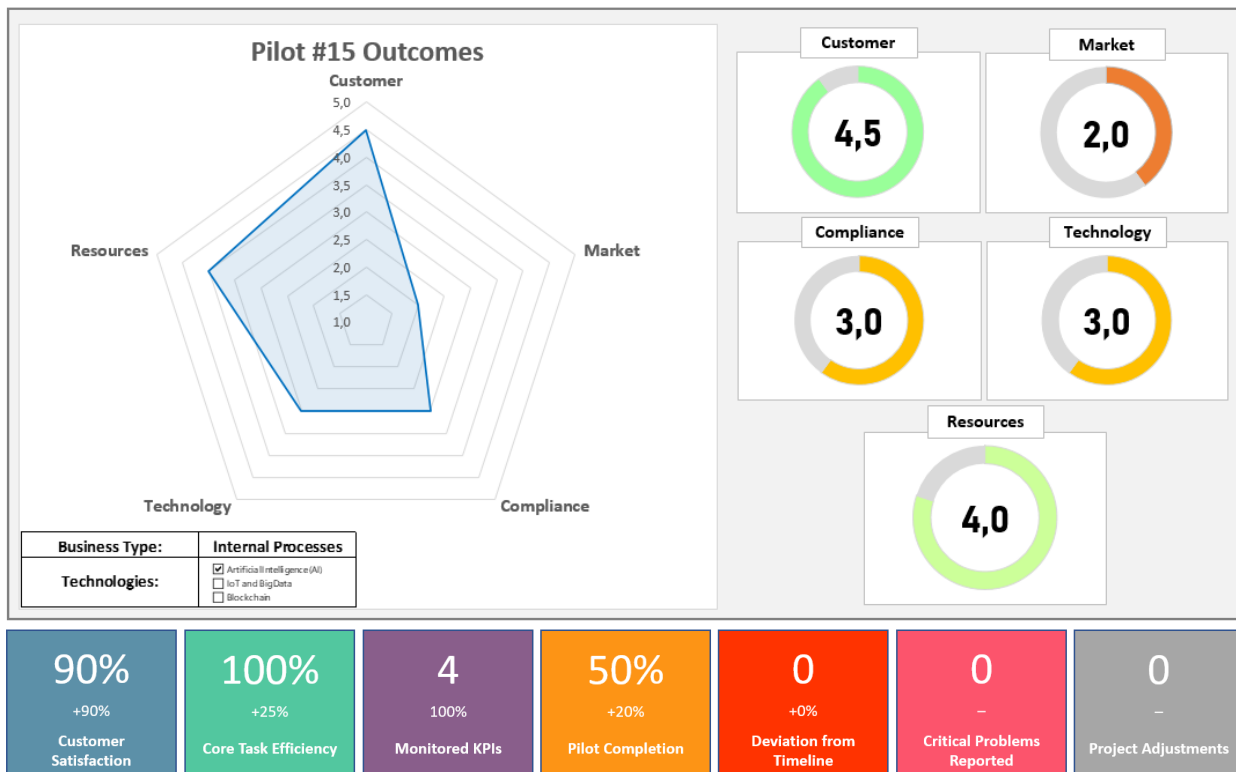


Figure 34 Pilot #15 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- Addresses critical points for the industry:** the results obtained so far, although at an experimental stage, **represent** a good starting point to comprehend the potentiality of *Natural Language Processing* (NLP) technologies in document enrichment and in automatic metadata creation. The Pilot's results may represent a baseline to address many stakeholders' needs, including:
 - Advanced Document Management (Intelligent Search for Business Analytics);
 - Compliance Analysis;
 - Advanced Process Management (support to process design and quality assessment).
- High degree of Innovation:** during the Pilot's workshop, the proposed solution received a somewhat high appreciation from the stakeholders to the extent that it was considered as highly innovative. Indeed, the Pilot is being developed in a context of open innovation, putting together the skills and competences of Different Banks and Innovation Partners. Such an approach was considered as a positive factor in supporting and speeding-up Innovation.
- Saturated Market:** even though there are many cases of AI application for NLP in the market, the Pilot's initiative stands out for its ambition in modeling the Bank Specific language. The result is a smart banking model whose document classification ability is just the first evidence of a variety of possible different applications. However, it is important to note that the project is not intended to build a ready-to-market tool. Rather, the scope of the initiative is to foster experimentation and innovation.

- **High levels of scalability and Integration:** the proposed model is built referencing to Transformer-based architecture, that exhibits the state-of-the-art on classification tasks. This element was considered as a good characteristic to support integration and scalability.
- **Offers Potential Enhancements:** interestingly, the ability of the system to acquire taxonomic expertise turns out to be surprisingly good and paves the way for systematic enhancement of unsupervised approaches to neural textual inference.
- **Needs more refinements to achieve full potential:** according to the project objectives, the model developed represents a first experimental artifact. In a later stage, the model will need to be contextualized to specific peculiarities of each bank to fully enhance its potential. Moreover, as being more focused on experimentation than on solution engineering, the Technology Readiness Level (TRL) of the solution presents some margins of further refinement.

Find below the status of the Pilot's KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (January 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency <i>(common-KPI)</i>	O	F1 score, monitored through technical measurement process	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	9,09%	56,00%	85%	>75%	YES
User Satisfaction <i>(common-KPI)</i>	B	Interviews with end users	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	4,5	5	NO
% Automation of workflow	O	Interviews with end users	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	4	5	NO
Usability	B	Interviews with end users	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	n.d.	n.d.	3	5	NO

Figure 35 Pilot #15 KPIs Status

3.14.2 Lessons Learned

An important lesson learned from the INFINITECH Pilot is the value of a continuous engagement with the end-users and early adopters. Having the opportunity to share the intermediate results and continuously re-align with the Pilot's objectives, not only contributed to strengthen the relationships with key users, but also to collect their invaluable insights for further improvements.

Additionally, it has become clear that strong measurements are paramount. By relying on collection of data and information against set KPI's it allows to fix and adjust the approach based on the data points collected. It is also worth mentioning the importance of using an agile and flexible approach that encourages on the spot testing and learning by doing - approach that enables sharing expertise, brings together vertical technological competences and functional skills.

3.15 Data Analytics Platform to detect payments anomalies linked to money laundering events

3.15.1 Outcomes

In the latest workshop, Pilot #16 engaged with 12 stakeholders comprised of anti-money laundering (AML) analysts, managers and data steward. From such interactions, the Pilot achieved the following results (see Figure 36):

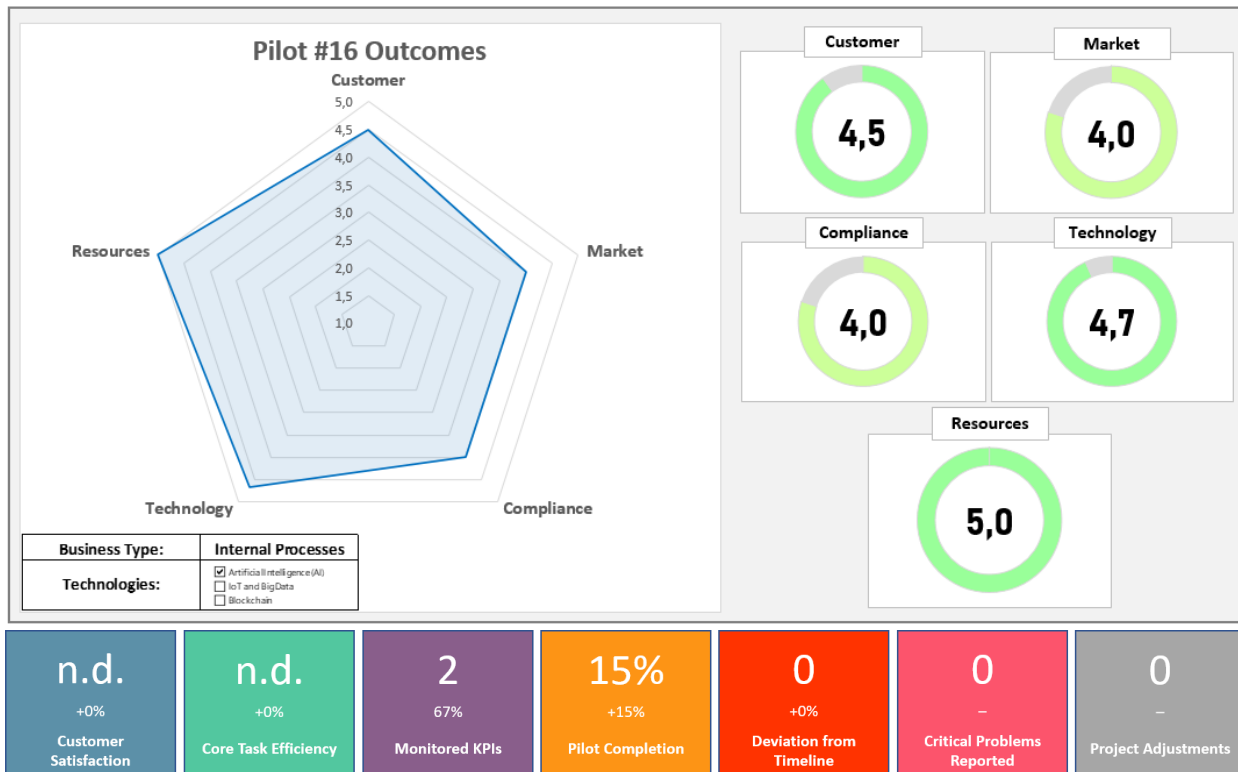


Figure 36 Pilot #16 Outcomes: INFINITECH Innovation Pentagon and additional metrics

Main parameters that contribute to the scores:

- **High level of Customer Satisfaction:** the Pilot has reached high levels of customer satisfaction due to NEXI knowledge of the anti-money laundering (AML) framework and needs.
- **Satisfactory Levels of Innovation:** the stakeholders reported that the product is in line with the expected degree of innovation and suggested some improvements regarding the possible case studies and user interface.
- **Offers Potential Enhancements:** out of the interaction with the workshop's participants the solution earned an above-average satisfaction in terms of utility and added value. Indeed, the solution's technological capabilities turns out to be highly attractive to improve the stakeholders' work efficiency in their daily operations of Anti-Money Laundering (enlarging the potentials of detection). It is in line with the stakeholders' market perspective. The Pilot will eventually produce an item that will be released as open source.
- **Addresses critical points for the industry:** the results obtained so far, although at an experimental stage, represent a good starting point to comprehend the potentiality of AML recognition systems technologies. The Pilot's results may represent a baseline to address many stakeholders' needs, including faster and enhanced AML activity recognitions.
- **Compliant with the constraints:** reportedly, the stakeholders consider the data management constraints to be respected in almost every case. Regarding the internal procedures the solution is coherent with the actual regulations.

- **High levels of Scalability and Integration:** reportedly, due to the open-source availability of the model, the solution’s interoperability, integration, and scalability factors in the stakeholders’ operations are excellent. This element is considered as a good characteristic to support integration and scalability adaptation and user enhancements.

Find below the status of the Pilot’s KPIs:

KPI Denomination	Type	Measurement Mode	ID	M	NR	CM	Initial KPI Measurement	KPI Measurement (June 2021)	KPI Measurement (December 2021)	Target Level	Achieved (YES/NO)
Core Task Efficiency <small>(common-KPI)</small>	O	internal analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Development and test of the Anomaly detection algorithms	NA	NA	Anomaly detection algorithms released	NO
User Satisfaction <small>(common-KPI)</small>	B	Workshop	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10 satisfied stakeholder	NA	NA	20 satisfied stakeholder	NO
Analysis Efficiency Index	B	Through Operation N of Reports / N of AML Analysts	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	N of Reports = 5 N of AML Analysts = 1			N of Reports = 10 N of AML Analysts = 1	NO

Figure 37 Pilot #16 KPIs Status

3.15.2 Lessons Learned

The main recommendation comes from the market perspectives and data management of the AML platform. The participant reported that the product performance could be excellent, but they need to test it on their environment and framework. Some of them may have some minor performance issues that could be solved with the software integration to their environment. The data management needs also to be tested in the stakeholder environment to validate it according to actual rules and regulations.

4 Aggregated Evaluation

In this section it will be outlined the Pilots' outcomes which have been aggregated and clustered according to different categories with respect to the "business types" and "technological areas".

Down below (Figure 38-39) the reader can observe the distribution of the Pilots among the identified categories:

Business Type	Pilots
B2B	Pilot #2, Pilot #4, Pilot #9, Pilot #11, Pilot #12, Pilot #13, Pilot #14
B2C	Pilot #5b, Pilot #6
Internal Processes	Pilot #3, Pilot #7, Pilot #10, Pilot #15, Pilot #16

Figure 38 Distribution of Pilots' Solutions per Business Type

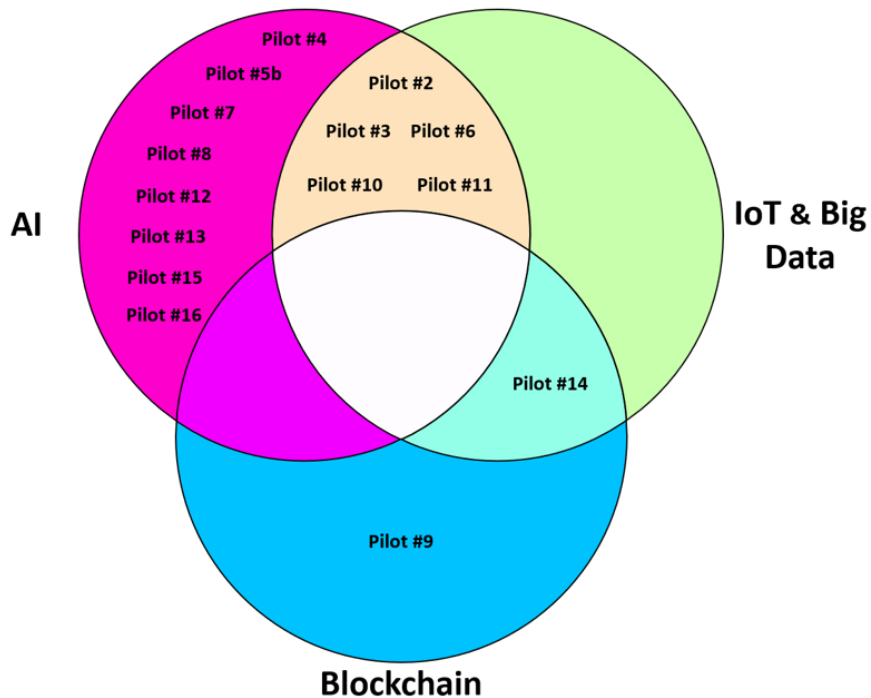


Figure 39 Distribution of Pilots' Solutions per Business Type

In Figure 40, it is reported the rating legend used to contextualize the level of satisfaction of key users regarding the Pilots' solutions, as well as to set the thresholds of goodness regarding the ratings obtained:

Rating Legend			
Associated value	Overall Satisfaction	Rate (average of votes)	Meaning
5	Excellent	≥ 4.3	Extremely satisfied
4	Very Good	[3.6-4.2]	Somewhat satisfied
3	Good	[2.6-3.5]	Neither satisfied nor dissatisfied (neutral)
2	Fair	[1.6-2.5]	Somewhat dissatisfied
1	Poor	≤ 1.5	Extremely dissatisfied

Figure 40 Satisfaction Rating Thresholds

4.1 Overall Results

The INFINITECH Pilots system is made up of long array of partners coming from all over the world, each of which has its own set of peculiarities, including different stakeholders, context, business-cases, and objectives. Despite such a tangible diversity, as well as some potential elements of complexity regarding the relations with early adopters, all the partners managed to ensure the right level of involvement of their stakeholders, managing to pursue Pilot's business objectives, achieving high appreciation scores from the recent workshops (see Annex A for more details).

Indeed, the overall results turn out to exceed the “Very Good” threshold spread over the 5 identified business dimensions, indicating an above-average level of stakeholders’ satisfaction concerning the Pilots’ solutions.



Figure 41 INFINITECH Customer Satisfaction Overall Outcomes

4.2 B2B Results

Regarding the Pilots belonging to the Business-to-Business (B2B) category, they proposed solutions achieved satisfying scores across all the business dimensions, indicating that the key stakeholders are somewhat satisfied about the Pilots’ development and outcomes.

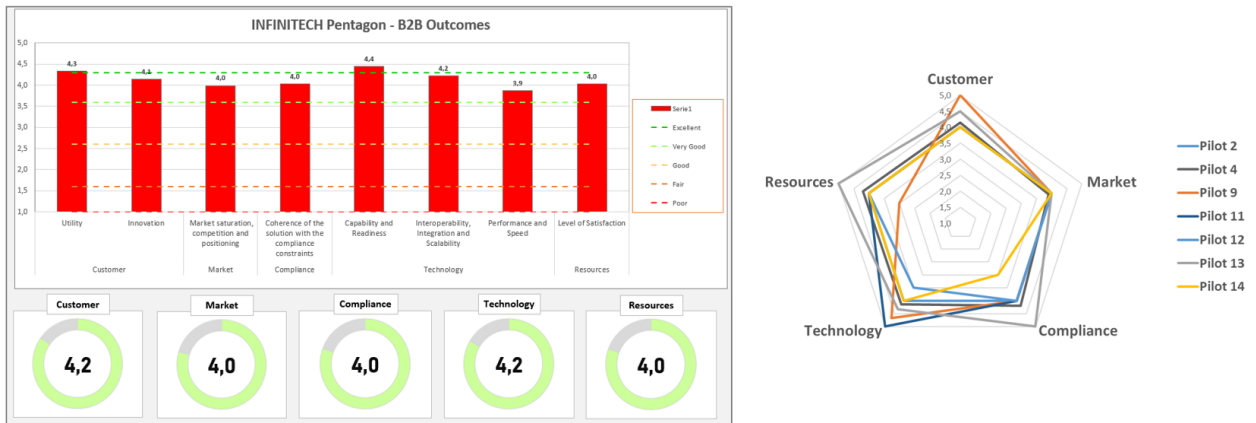


Figure 42 INFINITECH B2B Outcomes

4.3 B2C Results

Regarding the Pilots belonging to the Business-to-Customer (B2C) category, the proposed solutions achieved satisfying scores across all the business dimensions, indicating that the key stakeholders are somewhat satisfied about the Pilots’ development and outcomes, especially for the Customer perspective.

Indeed, it is worth noting the “Excellent” score achieved in the Customer dimension, (mostly attributed to the foreseen added value / utility out of the proposed solutions), suggesting that the Pilots’ results in that matter are way beyond stakeholders’ expectations.



Figure 43 INFINITECH B2C Outcomes

4.4 Internal Processes Results

This category includes the Pilots’ solutions that are developed and intended for stakeholders’ internal processes, whose functioning has no direct impact on business.

Same as the previous categories, the proposed solutions achieved satisfying scores across all the business dimensions, indicating that the key stakeholders are somewhat satisfied about the Pilots’ development and outcomes.



Figure 44 INFINITECH Internal Processes Outcomes

4.5 Technological Areas Comparison

Here we proposed a comparison of the scores obtained over the identified INFINITECH Technological Areas. These include AI, IoT&Big Data, and Blockchain.

By looking at the graph below (Figure 45) it is possible to realize how the AI and IoT&Big Data results are somewhat on the same wavelength, deviating by small deltas across the business dimensions. As for the Blockchain results, we need to consider that it is the smallest subset among all the technologies, therefore the results are mainly calculated as the average of two Pilots' results, whose scores are still above the satisfactory levels (especially for the Technology and Customer dimensions).

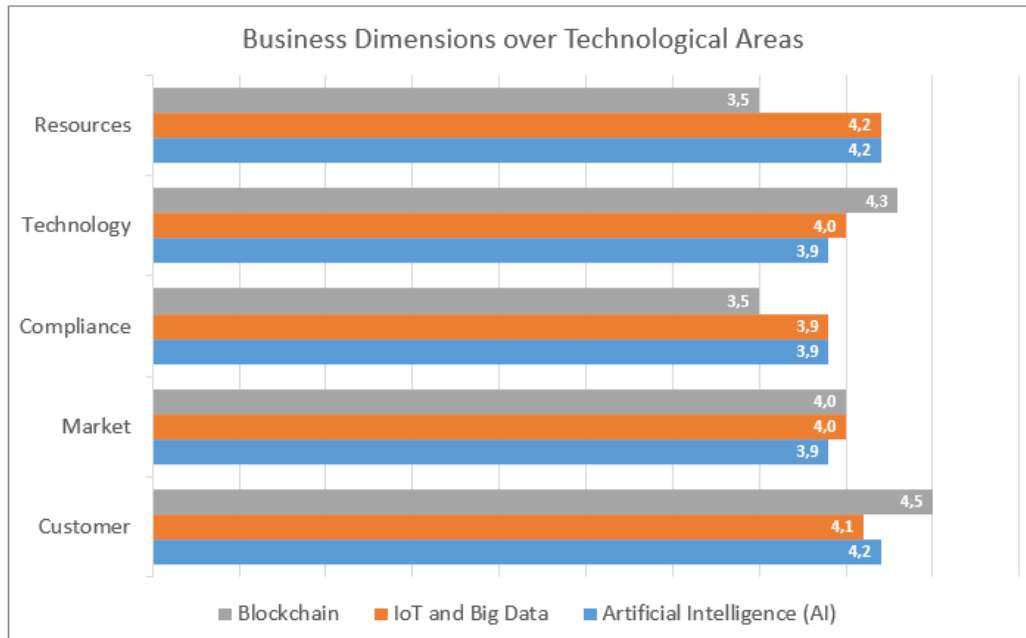


Figure 45 INFINITECH Technological Areas - Comparison of Achieved Scores

5 Conclusions

The Evaluation Approach presented in this document sets the basis for future stakeholders' workshops. The collection of feedback and the consequent evaluation of Pilots' outcomes herein presented, is not a standalone event. Rather, it is the very first step of a continuous engagement with the stakeholders, whose interactions will periodically repeat as to continuously improve the Pilots' solutions as well as to strengthen the relationships with the key users (i.e., end-users, early adopters, developer teams, subject-matter experts (SMEs) and relevant stakeholders – both internal and external).

Overall, the workshops enabled the Pilots to obtain a broad external involvement of key users as well as to collect any insights for improvement from the "outer ecosystem". This is where the value resides: the Pilots not only have gained visibility within the INFINITECH environment, but they have also shown their outcomes to the external businesses, which is part of the key success factors.

Such a visibility has been achieved depending on the Pilots' characteristics: Pilots have identified the best way to involve the appropriate stakeholders and use the appropriate tools to gather the feedback. Common elements achieved during the workshops include: the possibility to engage key people, collect the outcomes from the Pilot's development, and gather suggestions for further improvements.

Out of this feedback, it has been possible to evaluate the Pilots, both individually and collectively, providing the INFINITECH innovation pentagon (that mapped out the level of innovation of the solutions from different perspectives) as well as the key drivers that lead to achieve the stakeholder's satisfaction scores. With such information, not only the reader can clearly spot what are the strengths of the solutions, but also what are the areas that might have gaps and need further refinements.

Finally, by leveraging the Pilots' compartmentalization into categories (Business-wise and Technology-wise), the Consortium performed a clustered evaluations extracting and outlining trends out of the collective outcomes. The results seem to be living up to the stakeholders' expectations, if not beyond, over the identified dimensions.

6 Annex A – Workshops and Stakeholders

The following is an overview of the stakeholders' workshops held over the timespan of March 2021 – February 2022:

Workshops	Date	Event Type	Stakeholders
BigData and Artificial Intelligence for Portfolio Risk Assessment	16 th of March 2021	External Event	AI experts, Finance partners, Researchers, Traders, Financial institutions.
Multiple workshops with AML supervisors, BOS departments and project council, External Workshop with Slovenian Financial Intelligence Unit and Slovenian Securities Market Agency	From 14 th of October 2021 to 10 th December 2021	Internal and External Events	<p>Slovenian FIU: AML supervisors, legal and IT experts;</p> <p>Bank of Slovenia: director of Banking Supervision department, AML experts, members of project team;</p> <p>Jožef Stefan Institute: developers, members of project team</p> <p>BOS project council: BOS vice-governor, Director of Banking Supervision Department, Director of IT, Director of the Payment Operations Department, Compliance and Legal experts, AML supervisors.</p> <p>Employees of central bank of Slovenia: AML experts in the Banking Supervision Department</p> <p>BOS departments: employees from Banking Supervision Department, Payment Operations Department, Department of Financial Statistics, Banking operations department.</p>
Category 2: Personalized Retail and Investment Banking Services	18 th of November 2021	INFINITECH Meeting	Employees of bank, employees in financial institutions, Fintech employees, researchers.
H2020 Infinitech Project Pilot 9 Workshop - Analyzing Blockchain	26 th of November 2021	External Event	Two employees from Central Bank of Turkey, one employee from Aktif Bank.

Transaction Graphs for Fraudulent Activities			
Real-time cybersecurity analytics on Financial Transactions' BigData: How the ML is at the service of the real time fraudulent transactions detection	30 th of November 2021	Internal Meeting	(Apart from ENG team involved in INFINITECH) the responsible in ENG for the Distributed Ledger & Fintech research area together and his team were invited.
Fraud & Anomaly Detection in Instant Loans	From 13 th to 16 th of December 2021	Internal Meeting	Employees of CXB security department; Researchers and Developers of AI methods (FBK, FTS); Customer faced employees Financial Sector (FTS).
Infinitech (Horizon2020) use case review	15 th of December 2021	Direct Contact	Employees of bank, employees in financial institutions, Fintech employees, researchers.
AI and BigData: The Insurtech's drivers	16 th of December 2021	External Event	Insurance companies, tech-companies, consultancy companies, researchers.
Artificial Intelligence: is it possible to govern a revolution?	16 th of December 2021	External Event	Early adopters (representatives from the banks that are currently involved in the Pilot 15 experimental environment); Other Italian Banks (employees of banks that are part of the ABI Lab Consortium community); ICT Partner (ICT Companies, Fintech, AI experts from many firms that are currently collaborating with banks on AI); Italian Association for Artificial Intelligence; Representatives from Universities and Academia; European Banking Federation.
Nexi Pilot 16 use case	22 nd of February 2022	External Event	Anti -Money Laundering Analysts; Anti -Money Laundering Manager;

			Anti -Money Laundering Data Steward.
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7 Annex B – Workshops' Details

INFINITECH - Pilot #2 Workshop Overview							
Workshop Title:	BigData and Artificial Intelligence for Portfolio Risk Assessment				Date:	16/03/2021	
Agenda: (description of the topics presented)	Session 1: Portfolio Risk Assessment and Value-at-Risk Calculation 09:30 - 09:40: Workshop Introduction 09:40 - 10:00: "Data-Driven Customer Risk Assessment for Personalized Asset Recommendations", Pablo Carballo Nieto, Prive Technologies, GmbH, Austria 10:00 - 10:20: "An Automated, Personalized, Investment Recommendations System for Retail Customer", Nikolaos Droukas, National Bank of Greece 10:20 - 10:25: Short Break 10:25 - 10:45: "What Investments are Right for You?: Supporting Financial Advisors with Customer Risk Aware Investment Recommendations", Dr. Richard Mccreadie, University of Glasgow, UK 10:45 - 11:00: "Value at Risk (VaR) Assessment Challenges in High Frequency Trading", Petra Ristau, JRC Capital Management, GmbH, Germany 11:00 - 11:15: "Machine Learning Techniques for Value at Risk (VaR) Calculation", George Fatouros, INNOV-ACTS Ltd, Cyprus and George Markidis, University of Pireaus, Greece 11:15 - 11:25: Break Session 2: Demonstrations, Open Discussion and Stakeholders Feedback 11:25 - 11:45: System Demonstrations 11:45 - 11:55: Open Questions and Answers Session - (Questions from the Audience) 11:55 - 12:00: Meeting Close & Conclusions						
Link to the event: (if applicable to the Event Type)	https://0dmw1unq.sibpages.com/						
Event Type:	External Event	Duration of the event (h):	2.30 hours / 150 min	Number of Participants:	68 Registered; 38 Attended		
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	<ul style="list-style-type: none"> • AI experts • Finance partners • Researchers • Traders • Financial Institutions 						
INFINITECH - Pilot #3 Workshop Overview							
Workshop Title:	Infintech (Horizon2020) use case review				Date:	15/12/2021	
Agenda: (description of the topics presented)	Presentation materials shared in advance of the call 1. Overview of Pilot & Objectives - Intelligent Analysis for KYC and DISRUPT TRAFFIKING 2. Pilot #3 – Innovation 3. Pilot #3 Roadmap 4. Business Motivation 5. Use Cases 6. Questions						
Link to the event: (if applicable to the Event Type)							
Event Type:	Direct contact	Duration of the event (h):	2	Number of Participants:	9		
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	Banks, Consultants, Technology Vendors, Academia						

D7.21-Pilots' Evaluation and Stakeholders' Feedback – II

INFINITECH - Pilot #4 Workshop Overview						
Workshop Title:	Category 2: Personalized Retail and Investment Banking Services				Date:	18/11/2021
Agenda: (description of the topics presented)	<p>Current Work Status of Pilot4:</p> <ol style="list-style-type: none"> 1. Min allocation of an asset in generated portfolio 2. New fitness factors implemented 3. Report Brain Integration (incl. a separate section illustrating a detailed description of API v4.0) 4. ATOS Technology: DUOS Digital User Onboarding System <p>Reportbrain News Article Sentiment API v4.0</p> <ol style="list-style-type: none"> 1. Introduction 2. Sentiment Analysis Explanation 3. Sentiment Index 4. Output Examples <p>Workflow, Innovations</p> <ol style="list-style-type: none"> 1. Business Innovation 2. Technical Innovation <p>Conclusions</p> <ol style="list-style-type: none"> 1. KPIs Overview 2. KPIs Updates 3. Video Prototype 4. Lean Canvas 					
Link to the event: (if applicable to the Event Type)	Online Google Meet					
Event Type:	INFINITECH Meeting	Duration of the event (h):	2	Number of Participants:	17	
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	Cluster#2 Pilots + Stakeholders. Stakeholders' roles/positions/field of employment: AI / Big data / R&D, Fintech field, Consulting, Employee in Financial Institution, Employee in Bank, Auditing.					

INFINITECH - Pilot #5b Workshop Overview																																	
Workshop Title:	Cluster 2 Workshop				Date:	18/11/2021																											
Agenda: (description of the topics presented)	<table border="0"> <tr> <td>10:00-10:05 am</td> <td>Welcome</td> <td>George Karamanolis, CP</td> </tr> <tr> <td>10:05-10:15 am</td> <td>Introduction of INFINITECH</td> <td>Ernesto Troiano, GFT</td> </tr> <tr> <td>10:15-10:45 am</td> <td>Personalized Portfolio Management</td> <td>Pilot 04: PRIVE, RB</td> </tr> <tr> <td>10:45 -11:00 am</td> <td>Q/A and Feedback</td> <td>Greek Fintech Cluster</td> </tr> <tr> <td>11:00 -11:30 am</td> <td>Business Financial Management (BFM) tools delivering a Smart Business Advise</td> <td>Pilot 05b: BOC, UPRC</td> </tr> <tr> <td>11:30-11:45 am</td> <td>Q/A and Feedback</td> <td>Greek Fintech Cluster</td> </tr> <tr> <td>11:45 -12:15 pm</td> <td>Personalized Closed-Loop Investment Portfolio Management for Retail Customers</td> <td>Pilot 06: NBG</td> </tr> <tr> <td>12:15-12:30 pm</td> <td>Q/A and Feedback</td> <td>Greek Fintech Cluster</td> </tr> <tr> <td>12:30-13:00 pm</td> <td>Discussion-Closing</td> <td></td> </tr> </table>						10:00-10:05 am	Welcome	George Karamanolis, CP	10:05-10:15 am	Introduction of INFINITECH	Ernesto Troiano, GFT	10:15-10:45 am	Personalized Portfolio Management	Pilot 04: PRIVE, RB	10:45 -11:00 am	Q/A and Feedback	Greek Fintech Cluster	11:00 -11:30 am	Business Financial Management (BFM) tools delivering a Smart Business Advise	Pilot 05b: BOC, UPRC	11:30-11:45 am	Q/A and Feedback	Greek Fintech Cluster	11:45 -12:15 pm	Personalized Closed-Loop Investment Portfolio Management for Retail Customers	Pilot 06: NBG	12:15-12:30 pm	Q/A and Feedback	Greek Fintech Cluster	12:30-13:00 pm	Discussion-Closing	
10:00-10:05 am	Welcome	George Karamanolis, CP																															
10:05-10:15 am	Introduction of INFINITECH	Ernesto Troiano, GFT																															
10:15-10:45 am	Personalized Portfolio Management	Pilot 04: PRIVE, RB																															
10:45 -11:00 am	Q/A and Feedback	Greek Fintech Cluster																															
11:00 -11:30 am	Business Financial Management (BFM) tools delivering a Smart Business Advise	Pilot 05b: BOC, UPRC																															
11:30-11:45 am	Q/A and Feedback	Greek Fintech Cluster																															
11:45 -12:15 pm	Personalized Closed-Loop Investment Portfolio Management for Retail Customers	Pilot 06: NBG																															
12:15-12:30 pm	Q/A and Feedback	Greek Fintech Cluster																															
12:30-13:00 pm	Discussion-Closing																																
Link to the event: (if applicable to the Event Type)	https://drive.google.com/drive/folders/1leeZUCV20d4LYSDPGYFinD0c7MvOCa4Z																																
Event Type:	External Event	Duration of the event (h):	2	Number of Participants:	30																												
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	Employees of bank, employees in financial institutions, Fintech employees, researchers																																

D7.21-Pilots' Evaluation and Stakeholders' Feedback – II

INFINITECH - Pilot #6 Workshop Overview						
Workshop Title:	Infitech Cluster#2 -- Workshop				Date:	18/11/2021
Agenda: (description of the topics presented)	Pilot technical and business progress and achievements so far					
Link to the event: (if applicable to the Event Type)	https://www.youtube.com/watch?v=WFOA5zP4V20					
Event Type:	External Event	Duration of the event (h):	3	Number of Participants:	22	
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	Employees of Banks and Financial Institutions, Fintech stakeholders					

INFINITECH - Pilot #7 Workshop Overview						
Workshop Title:	Fraud & Anomaly Detection in Instant Loans				Date:	16/12/2021 13-->16 Dec.
Agenda: (description of the topics presented)	Introduction to INFINITECH Presentation of the Pilot's objectives and approach Discussion and Feedback					
Link to the event: (if applicable to the Event Type)	N/A					
Event Type:	Internal Meeting	Duration of the event (h):	1	Number of Participants:	15	(15+)
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	Employees of CXB security department Researchers and Developers of AI methods (FBK, FTS) Customer faced employees Financial Sector (FTS)					

D7.21-Pilots' Evaluation and Stakeholders' Feedback – II

INFINITECH - Pilot #8 Workshop 1 Overview						
Workshop Title:	External Workshop with Slovenian Securities Market Agency [F2F]				Date:	14/10/2021
Agenda: (description of the topics presented)	1. Presentation of Risk Assessment tool 2. Evaluation and feedback on Risk Assessment tool					
Link to the event:						
Event Type:	External Event	Duration of the event (h):	1,5	Number of Participants:	10	
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	Slovenian Securities Market Agency: AML supervisors, legal and IT experts, Bank of Slovenia: AML supervisors, members of project team Jožef Stefan Institute: member of project team					
INFINITECH - Pilot #8 Workshop 2 Overview						
Workshop Title:	External Workshop with Slovenian Financial Intelligence Unit (FIU) [F2F]				Date:	14/10/2021
Agenda: (description of the topics presented)	1. Presentation of Risk Assessment tool 2. Cooperation between BOS and Slovenian FIU 2. Evaluation and feedback on Risk Assessment tool					
Link to the event:						
Event Type:	Internal Meeting	Duration of the event (h):	1,5	Number of Participants:	9	
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	Slovenian FIU: AML supervisors, legal and IT experts, Bank of Slovenia: director of Banking Supervision department, AML experts, members of project team, Jožef Stefan Institute: developers, members of project team					
INFINITECH - Pilot #8 Workshop 3 Overview						
Workshop Title:	Internal Meeting BOS project council [Online]				Date:	03/11/2021
Agenda: (description of the topics presented)	1. Presentation of Distribution Channel and Risk Assessment tool 2. Evaluation and feedback on Distribution Channel and Risk Assessment tool					
Link to the event:						
Event Type:	Internal Meeting	Duration of the event (h):	1,5	Number of Participants:	9	
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	The BOS project council consists of: * BOS vice-governor, * Director of Banking Supervision Department, * Director of IT, * Director of the Payment Operations Department, * Compliance and Legal experts, * AML supervisors.					
INFINITECH - Pilot #8 Workshop 4 Overview						
Workshop Title:	Internal Workshop with AML supervisors [F2F]				Date:	08/11/2021
Agenda: (description of the topics presented)	1. Presentation of Distribution Channel and Risk Assessment tool 2. Testing and Use of the Risk Assessment by end users (AML supervisors within BOS) 3. Evaluation and feedback from end users.					
Link to the event:						
Event Type:	Internal Meeting	Duration of the event (h):	5,5	Number of Participants:	7	
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level)	Employees of central bank of Slovenia: AML experts in the Banking Supervision Department					

D7.21-Pilots' Evaluation and Stakeholders' Feedback – II

INFINITECH - Pilot #8 Workshop 5 Overview						
Workshop Title:	Internal Workshop with different BOS departments [Online]				Date:	10/12/2021
Agenda: (description of the topics presented)	1. Presentation of Distribution Channel and Risk Assessment tool 3. Evaluation and feedback.					
Link to the event:						
Event Type:	Internal Meeting	Duration of the event (h):	1,5	Number of Participants:	12	
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	BOS departments: employees from Banking Supervision Department, Payment Operations Department, Department of Financial Statistics, Banking operations department.					

INFINITECH - Pilot #9 Workshop Overview						
Workshop Title:	H2020 Infinittech Project Pilot 9 Workshop - Analyzing Blockchain Transaction Graphs for Fraudulent Activities				Date:	26/11/2021
Agenda: (description of the topics presented)	Presentations were made about the Pilot #9 system. Topics presented include: - Introduction - INFINITECH, Blockchain Technologies, CBDCs - Regulations and Banking - Pilot #9 Overview and Architecture - Parallel Transaction Graph Analysis, Demo - Bitcoin, Ethereum Address Database and User Interface, Demo					
Link to the event: (if applicable to the Event Type)	https://docs.google.com/document/d/1-85r5MaUPr_GQX22-A36dX-1VioZ8D0YnGSuYkd_m_A/edit?usp=sharing					
Event Type:	External Event	Duration of the event (h):	1,5	Number of Participants:	3	
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	Two employees from Central Bank of Turkey, one employee from Aktif Bank					

INFINITECH - Pilot #10 Workshop Overview						
Workshop Title:	Real-time cybersecurity analytics on Financial Transactions' BigData: How the ML is at the service of the real time fraudulent transactions detection				Date:	30/11/2021
Agenda: (description of the topics presented)	Introduction to INFINITECH project (5 min - Susanna Bonura) Real-time cybersecurity analytics on financial transactions' data - Business Motivation (10 min - Susanna Bonura) Proposed ML-based system architecture: challenges and goals (15 min - Salvatore Cipolla) Q&A (10 min) Survey (20 min)					
Link to the event: (if applicable to the Event Type)						
Event Type:	Internal Meeting	Duration of the event (h):	1	Number of Participants:	4	
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	(A part from ENG team involved in INFINITECH) the responsible in ENG for the Distributed Ledger & Fintech research area together and his team were invited.					

D7.21-Pilots' Evaluation and Stakeholders' Feedback – II

INFINITECH - Pilot #11 Workshop Overview						
Workshop Title:	AI and BigData: The Insurtech's drivers				Date:	16/12/2021
Agenda: (description of the topics presented)	12:30 (CET) : Introduction by Carmen Perea, ATOS Spain 12:35: Pilot 11 Artificial Intelligence applied to driving profiling and enhanced risk estimation: INFINITECH use case implementation by Ignacio EliceGUI, ATOS Spain 12:55: Pilot 12: Personalized Health Insurance Products by Aristodemos Pnevmatikakis, Innovation Sprint 13:15 : Pilot 13: AI insurance risk selection & insurance products' recommender for SME's by Carlos Albo, Wenalyze 13:35 : Pilot 14: Infinittech Agl toolbox: Big Data and Climate risk analysis for the Agriculture Insurance sector, in the face of climate crisis by Grigoris Mygdakos, Agro Apps					
Link to the event: (if applicable to the Event Type)	https://app.livestorm.co/finance-innovation/ai-and-bigdata-the-insurtechs-drivers					
Event Type:	External Event	Duration of the event (h):	1,5	Number of Participants:	23	
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	Insurance companies, tech-companies, consultancy companies, researchers					

INFINITECH - Pilot #12 Workshop Overview						
Workshop Title:	AI and BigData: The Insurtech's drivers				Date:	16/12/2021
Agenda: (description of the topics presented)	12:30 (CET) : Introduction by Carmen Perea, ATOS Spain 12:35: Pilot 11 Artificial Intelligence applied to driving profiling and enhanced risk estimation: INFINITECH use case implementation by Ignacio EliceGUI, ATOS Spain 12:55: Pilot 12: Personalized Health Insurance Products by Aristodemos Pnevmatikakis, Innovation Sprint 13:15 : Pilot 13: AI insurance risk selection & insurance products' recommender for SME's by Carlos Albo, Wenalyze 13:35 : Pilot 14: Infinittech Agl toolbox: Big Data and Climate risk analysis for the Agriculture Insurance sector, in the face of climate crisis by Grigoris Mygdakos, Agro Apps					
Link to the event: (if applicable to the Event Type)	https://app.livestorm.co/finance-innovation/ai-and-bigdata-the-insurtechs-drivers					
Event Type:	External Event	Duration of the event (h):	1,5	Number of Participants:	23	
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	Insurance companies, tech-companies, consultancy companies, researchers					

INFINITECH - Pilot #13 Workshop Overview						
Workshop Title:	AI and BigData: The Insurtech's drivers				Date:	16/12/2021
Agenda: (description of the topics presented)	12:30 (CET) : Introduction by Carmen Perea, ATOS Spain 12:35: Pilot 11 Artificial Intelligence applied to driving profiling and enhanced risk estimation: INFINITECH use case implementation by Ignacio EliceGUI, ATOS Spain 12:55: Pilot 12: Personalized Health Insurance Products by Aristodemos Pnevmatikakis, Innovation Sprint 13:15 : Pilot 13: AI insurance risk selection & insurance products' recommender for SME's by Carlos Albo, Wenalyze 13:35 : Pilot 14: Infinittech Agl toolbox: Big Data and Climate risk analysis for the Agriculture Insurance sector, in the face of climate crisis by Grigoris Mygdakos, Agro Apps					
Link to the event: (if applicable to the Event Type)	https://app.livestorm.co/finance-innovation/ai-and-bigdata-the-insurtechs-drivers					
Event Type:	External Event	Duration of the event (h):	1,5	Number of Participants:	23	
Players Involved: (e.g., employees of banks and financial institutions, blockchain experts and consultants, top-level managers, business developers, researchers, etc.)	Insurance companies, tech-companies, consultancy companies, researchers, MGA, Banks, Reinsurance companies. Given that during the workshop the collection of opinions on the questionnaires was not high, the questionnaires were subsequently sent to stakeholders. Nine responses were obtained from different companies. Answer were answered buy stakeholders from different countries, Spain, Germany, Argentina and Switzerland					

8 References

[1] Springer (2021) “*Digital Finance*” Source: <https://www.springer.com/journal/42521>

[2] EY Global Wealth Research Report. EYG no. 003263-21Gbl. (2021) “*Where will wealth take clients next?*” Source: https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/wealth-and-asset-management/ey-2021-global-wealth-research-report.pdf

[3] Source: <https://www.fatf-gafi.org/publications/fatfrecommendations/documents/guidance-rba-virtual-assets-2021.html>

[4] Source: https://docs.google.com/spreadsheets/d/1_LghI9zgA5wGARjd1q6V-eP7xWJzw1gx/edit?usp=sharing&ouid=115760979640495528344&rtpof=true&sd=true