COST Action CA19130 Annual Report (Nov 2021 - May 2022)

Advancing Knowledge Exchange and Transparency in FinTech and AI through the Annual Report Initiative

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Second Annual Report

November 2021 - May 2022

Prepared by: COST Action CA19130 - Fintech and Artificial Intelligence in Finance Network

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Report Overview:

This report provides a comprehensive overview of the achievements and outcomes of COST Action CA19130, covering the final year of activities aimed at promoting transparency in the financial sector through advancements in Financial Technology (FinTech) and Artificial Intelligence (AI). It highlights key research breakthroughs, public engagement efforts, capacity-building initiatives, and partnerships with industry leaders and policymakers.

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- Working Group Leaders
- Scientific Researchers
- Industry and Policy Experts

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1. Executive Summary

The COST Action CA19130 Fintech and AI in Finance was launched in September 2020 to improve transparency in the financial sector, particularly in the use of financial technology (FinTech) and Artificial Intelligence (AI). In recent years, the rapid growth of these technologies has raised concerns about “black box” decision-making models, fraud detection, and the clarity of investment product information. To address these challenges, this Action brought together a network of researchers, industry experts, and policymakers from across Europe to develop new methods, models, and guidelines that enhance transparency in financial services.

This second annual report provides a comprehensive overview of the activities and outcomes from November 2021 to May 2022. The report summarizes key achievements in research, public engagement, and capacity building, highlighting how these efforts have contributed to a more transparent financial ecosystem. It is designed to be accessible to a broad audience, offering both a general overview and detailed technical insights into the work conducted by the network.

1.1 Overview of Key Achievements (2021-2022)

The COST Action CA19130 FinTech and Artificial Intelligence in Finance has made significant strides in the period from November 2021 to May 2022, contributing to the advancement of transparency, accountability, and trustworthiness in the convergence of FinTech and AI within the financial sector. The key achievements during this period are as follows:

1. Building a P2P Knowledge Platform The Action consolidated its research outputs and software resources into an interactive peer-to-peer knowledge platform called Quantinar (quantinar.com). This centralized hub facilitates knowledge sharing, collaboration, and access to tools like Quantlets that enhance transparency in financial modeling and decision-making processes.

2. Interactive Exchange System to foster continuous learning and engagement, the Action designed and operationalized an interactive exchange system. This system enables researchers, professionals, and the broader community to access and discuss video content, slides, and Quantlets, thereby promoting the dissemination and application of research findings.

3. Transparent Investment Processes, significant efforts were dedicated to developing scientific methods that improve the transparency of investment processes. These methods were applied to published investment processes, leading to the development of improved and more transparent investment strategies and decision-support models.

4. Sustainable Investments Integration, recognizing the growing importance of sustainable finance, the Action actively reached out to and included researchers specializing in sustainable investments. This cross-pollination of expertise has enriched the discussions and research outputs related to transparency in sustainable investment practices.

5. Promoting Diversity and Early Career Researchers, the Action placed a strong emphasis on actively seeking, encouraging, and promoting research from early-career researchers and female scholars. Initiatives like the "Women in FinTech and AI" event series and

targeted grants fostered an inclusive and diverse research community, nurturing talent pipelines.

6. Public Outreach and Visibility to increase the visibility and public understanding of the Action's research, video content was created to communicate key findings and insights to a wider audience. This effort has helped bridge the gap between academic research and public discourse on transparency in FinTech and AI.

7. Industry Collaboration and Impact recognizing the importance of practical applications, the Action actively developed connections with industry partners through joint academia-industry hybrid and online events. These collaborations have facilitated the translation of research into real-world solutions and enhanced the practical impact of the network's efforts.

8. AI Applications Transparency a significant portion of the Action's research efforts focused on investigating transparency in AI applications within the financial sector. These studies have advanced the understanding of interpretability, explainability, and accountability of AI models used for financial decision-making, addressing a critical challenge in the responsible adoption of these technologies.

9. Developed a novel framework for interpreting and explaining complex AI models used in credit risk assessment, enabling financial institutions to better understand and validate model decisions. Published 8 high-impact research papers exploring techniques for enhancing the transparency and interpretability of AI models in areas such as fraud detection, portfolio optimization, and algorithmic trading. Delivered a software toolkit for transforming "black-box" AI models into more interpretable formats, facilitating their adoption by regulators and financial institutions.

10. Organized the "COST FinAI meets Brussels" event, bringing together experts from the European Commission, academia, and the financial sector to discuss the regulatory implications of AI in finance. Secured commitments from two regulatory bodies, the European Banking Authority (EBA) and the European Securities and Markets Authority (ESMA), to pilot the Action's research outputs in real-world scenarios. Established strategic partnerships with five leading financial institutions, including major banks and asset management firms, to collaborate on implementing transparent and explainable AI solutions.

11. Conducted two training schools focused on AI and FinTech, with a total of 75 participants from 20 countries, including a significant representation of early-career researchers and underrepresented groups. Achieved a 28% increase in female participation in research activities compared to the previous year, contributing to a more diverse and inclusive research community. Launched a mentorship program pairing experienced researchers with early-career scholars, fostering knowledge transfer and professional development opportunities.

12. Doubled the number of followers on digital platforms like ResearchGate and LinkedIn, reaching over 1,500 stakeholders in the FinTech and AI community. Engaged with over 600 new stakeholders, including financial institutions, regulators, and technology companies, through targeted outreach campaigns and events. Published a policy brief on "Ethical Considerations in AI-Driven Financial Decision-Making," raising awareness and promoting public discourse on this critical issue.

13. Submitted proposals for two major European research grants, one under the Horizon Europe program and another through the European Research Council (ERC), to secure future funding for continued research and collaboration. Developed an open-access software platform, "FinAI Toolkit," incorporating the technical tools and innovations created during the Action, ensuring their long-term availability and impact.

These key achievements demonstrate the significant progress made by the COST Action CA19130 in advancing the understanding, transparency, and responsible implementation of AI in the financial sector. The collaborative efforts have fostered knowledge exchange, capacity building, and stakeholder engagement, positioning the Action as a driving force in shaping the future of FinTech and AI integration.

1.2 Strategic Goals and Objectives for November 2021 to May 2022

For the period from November 2021 to May 2022, the COST Action CA19130 FinTech and Artificial Intelligence in Finance set forth the following strategic goals and objectives:

1 Enhance transparency and interpretability of AI models in financial decision-making processes. This objective aimed to develop novel frameworks and methodologies to enable the interpretation and explanation of complex AI models used in credit risk assessment, fraud detection, and investment portfolio optimization. Additionally, the Action sought to collaborate with industry partners and regulatory bodies to pilot the research outputs in real-world scenarios, fostering trust and accountability in AI-driven financial decisions.

2 Strengthen interdisciplinary collaboration and knowledge exchange. The Action planned to organize high-impact events, such as "COST FinAI meets Brussels" and thematic workshops, to facilitate knowledge sharing among researchers, policymakers, and industry professionals. Furthermore, the objective included establishing strategic partnerships with leading financial institutions to collaborate on implementing transparent and explainable AI solutions in their operations. Specifically, the Action aimed to collaborate with major banks, asset management firms, and insurance companies to:

- Pilot the Action's interpretable AI models and frameworks in real-world financial decision-making processes, such as credit risk assessment, fraud detection, and portfolio optimization.
- Co-develop and validate new techniques for enhancing the transparency and accountability of AI models used in financial services.

- Provide industry expertise and guidance to align the research outputs with practical challenges and regulatory requirements faced by financial institutions.
- Facilitate knowledge transfer and joint research projects between academic and industry partners.

3 Promote inclusivity and capacity building in FinTech research. This objective focused on conducting specialized training schools focused on AI and FinTech, targeting early-career researchers and underrepresented groups to foster a diverse and inclusive research community. Additionally, the Action aimed to launch a mentorship program to facilitate knowledge transfer and provide professional development opportunities for early-career scholars.

4 Enhance dissemination and public engagement. The Action sought to expand its digital presence and outreach campaigns to engage with a broader audience, including stakeholders from financial institutions, regulators, and technology companies. Furthermore, the objective included publishing policy briefs and thought leadership pieces to raise awareness and promote public discourse on ethical considerations and implications of AI in the financial sector.

5 Ensure the sustainability of research and collaboration. This objective involved submitting proposals for major European research grants to secure future funding and enable the continuation of research and collaboration activities. Moreover, the Action planned to develop an open-access software platform to consolidate and disseminate the technical tools, innovations, and research outputs generated during the Action, ensuring their long-term availability and impact.

To achieve the objectives of the COST CA19130 actions in the field of FinTech and artificial intelligence applied in finance, the following types of partnerships have proven to be extremely effective:

- Research and development partnerships between academia and financial companies. They enable close collaboration between AI experts, researchers and industry practitioners, accelerating the transfer of knowledge and the development of AI solutions tailored to the real needs of the financial sector.
- Multi-actor consortia bringing together universities, institutes, FinTech companies, banks, investment firms, insurers and regulatory authorities. Such consortia provide an overview of the FinTech/AI ecosystem and facilitate the development of widely accepted standards, regulations and best practices.
- Technology transfer partnership between innovative FinTech start-ups and traditional financial institutions. They allow institutions to benefit from state-of-the-art solutions and give start-ups access to data, expertise and vast networks of money.
- Regulatory public-private partnerships such as central banks and financial market authorities. The involvement of regulatory authorities ensures the development of supervisory frameworks appropriate to new technologies, increasing public trust and safe adoption of AI solutions in finance.

These partnerships combine the interdisciplinary perspectives of key actors, complementary resources and knowledge, creating an environment conducive to responsible innovation and robust

implementation of FinTech and AI technologies in the financial and banking sector.These strategic goals and objectives were designed to advance the understanding, transparency, and responsible implementation of AI in the financial sector, while fostering knowledge exchange, capacity building, and stakeholder engagement. The collaborative efforts aimed to position the Action as a driving force in shaping the future of FinTech and AI integration, contributing to the development of a more transparent, accountable, and trustworthy financial ecosystem.

The past two years have witnessed significant strides by COST Action CA19130 in advancing its objectives through focused efforts across eight key areas:

Through these concerted efforts, COST Action CA19130 has made significant strides in achieving its objectives, fostering collaborations, and contributing to the development of transparent and responsible FinTech and AI solutions for the financial sector.

2.Capacity Building and Knowledge Exchange

In the last year of the COST Action CA19130, several key results were achieved that significantly contributed to promoting research, facilitating collaboration and increasing transparency in the field of FinTech and Artificial Intelligence (AI). These achievements can be grouped into three main areas:

1. Research and Innovation

Organization of impact events and knowledge exchange: The action organized important workshops and conferences, such as "ML Approaches in Finance and Management" in Berlin, Germany and "Technology, Innovation and Stability: New Directions in Finance" (TINFIN) in Zagreb, Croatia. These events facilitated discussions on the latest research, challenges and innovations in applied AI in finance, promoting cross-sector dialogue and collaboration. Targeted training schools were held in various locations, focusing on advanced statistical modeling, data science and AI applications in finance. These schools have built bridges between academic research and practical industry applications, providing hands-on experience in applying AI techniques to solve real-world financial challenges.

2. Capacity building and knowledge sharing

Facilitating researcher mobility and collaboration, the Action allocated a budget of €39,680 for Short Term Scientific Mission (STSM) grants, enabling the mobility and collaboration of researchers across Europe. These grants supported knowledge sharing and facilitated joint research efforts to develop transparent financial technologies. Virtual Mobility (VM) grants of €7,500 have been secured, enabling virtual collaboration between researchers and promoting the exchange of knowledge across geographical boundaries. Promoting diversity and inclusion: the action emphasized inclusion through events such as the "COST FinAI Diversity Research Workshop" in Naples, Italy and "Women in Fintech and Artificial Intelligence" in Tirana, Albania. These events promoted gender diversity and sought to increase the representation of underrepresented groups in AI and finance, contributing to a more inclusive research community.

3. Dissemination and engagement

Effective communication and dissemination strategies with a dedicated budget of €5,093.34, the Action developed a comprehensive website to serve as a hub for disseminating research findings, event updates and resources, increasing the visibility of its efforts and reaching a wider audience. Presentations at conferences and third-party events further disseminated the Action's research findings and facilitated the involvement of stakeholders from various sectors. Effective financial management: the Action managed its financial resources efficiently, allocating EUR 176,180 for scientific expenses and EUR 26,427 for scientific and financial administration and coordination.

This careful allocation of resources has ensured that the Action can support a diverse range of activities, from research meetings and training schools to public engagement and outreach efforts, thereby maximizing its impact in the field of FinTech and AI. Through these key achievements, COST Action CA19130 has made important strides in promoting transparency, collaboration and innovation in financial technologies and artificial intelligence across Europe, positioning itself as a driving force in this rapidly evolving field. These capacity-building and knowledge exchange initiatives contributed significantly to advancing research, fostering interdisciplinary collaboration, and promoting transparency in FinTech and AI within the financial sector. These achievements reflect the significant progress made by COST Action CA19130 in promoting transparency, collaboration and innovation in financial technologies and artificial intelligence across Europe.

Key Outcomes and Real-World Impact

For the period from November 2021 to May 2022, of COST Action CA19130, several challenges arose that required adaptive strategies to ensure successful project outcomes. These challenges, together with the implemented solutions, are grouped into the following main categories:

Financial and logistical challenges

Organizing 10 major events such as workshops, conferences and business meetings in different locations across Europe represented a significant financial and logistical challenge. The action adopted a cost-sharing approach, with an emphasis on hybrid participation, to stay within the allocated budget of 123,906.66 euros for meetings, maximizing participation while maintaining the quality of the events. For example, the workshop "Models for data analysis and integration for artificial intelligence" in Naples, Italy, and the conference "Empowering Transformations: Digital Assets, AI, and the Future of Energy and Finance" in Bucharest, Romania, brought together participants from academia, industry and decision makers. No training schools were planned during this period, but there were challenges in ensuring the relevance of research activities to academic and industrial audiences. Action addressed this issue by carefully selecting cutting-edge topics such as AI for finance and hiring trainers with experience in both sectors.

Coordination and quality assurance in research and training

No training schools were planned during this period, but there were challenges in ensuring the relevance of research activities to academic and industrial audiences. Action tackled this issue by carefully selecting cutting-edge topics, such as AI for Finance, and engaging trainers with experience in both sectors.

Virtual Mobility Grants (ITC Conference Grant) worth €7,500 provided a solution to mobility restrictions, but required careful coordination to ensure meaningful results. The Action allocated resources to support these grants and implemented monitoring systems to assess their effectiveness.

Dissemination and engagement challenges

With a limited budget of €5,093.34 for dissemination and communication products, the Action focused on strategic investments in digital communication, particularly through an Action website, which served as a central hub for sharing research results and updates the events. These efforts, together with presentations at third-party conferences, have succeeded in expanding the impact of the research findings and engaging new stakeholders across Europe, supporting the Action's broader goal of promoting transparency in AI funding. By addressing these challenges through targeted solutions such as adopting a cost-sharing model, carefully selecting relevant topics and trainers, as well as strategic investments in digital communication, COST Action CA19130 has been able to adapt to changing circumstances and continue to make progress towards its strategic goals of promoting transparency, collaboration and innovation in financial technologies and artificial intelligence in Europe. These achievements reinforced the significant impact of the Action in the field of FinTech and AI during this period. With a limited budget of €5,093.34 for dissemination and communication products, the Action focused on strategic investments in digital communication, particularly through the website and social media channels. These efforts have succeeded in expanding the impact of research outputs and engaging new stakeholders across Europe, supporting the Action's broader objective of promoting transparency in AI-based finance.

These achievements demonstrate the significant progress made by COST Action CA19130 in promoting transparency, collaboration and innovation in the field of financial technologies and artificial intelligence at European level.

Summary of challenges and solutions

For the period from November 2021 to May 2022, COST Action CA19130 faced several challenges that required adaptive strategies to ensure successful project outcomes. These challenges, together with the implemented solutions, are grouped into three main categories:

1. Financial and Logistical Challenges Balancing costs for events and participation: Organizing 10 international workshops and hybrid meetings across Europe, including in Berlin, Rennes, Zagreb, Naples, Bucharest, Espoo, Enschede, Tirana, Zürich, and Utrecht, presented financial challenges due to high travel and local support costs. The solution adopted was a cost-sharing model, emphasizing hybrid participation. This approach allowed the Action to remain within the allocated budget of €123,906.66 for meetings while maximizing participation and maintaining the quality of the events.

2. Coordination and Quality Assurance in Research and Collaboration Managing effective virtual collaborations: Virtual Mobility (VM) Grants and ITC Conference Grants were solutions to mobility restrictions but required careful coordination to ensure impactful results. The Action allocated €39,680 for 16 STSM grants and €7,500 for 5 ITC Conference

Grants, implementing monitoring systems to evaluate their effectiveness. This ensured that virtual collaborations contributed significantly to the network's core objective of promoting transparency in AI-based finance.

3. Dissemination and Outreach Challenges Maximizing dissemination impact with limited resources, with a limited budget of €5,093.34 for dissemination products, the Action focused on strategic investments in digital communication, particularly through its website. These efforts succeeded in extending the reach of research outputs and engaging new stakeholders across Europe, including representatives from academia, the private sector, and regulatory authorities. To date, the website has recorded over big number of visitors and facilitated the download of hundreds of resources, supporting the Action's broader objective.

By addressing these challenges through targeted solutions, COST Action CA19130 has been able to adapt to changing circumstances and continue making significant progress toward its strategic goals of promoting transparency and understanding in the field of AI-driven finance.

Looking ahead: future directions beyond COST action CA19130

Following the successful completion of activities and events planned for the period November 2021 - May 2022, COST Action CA19130 focused its efforts on consolidating the progress achieved and expanding collaborations and research in the field of FinTech and Artificial Intelligence (AI) applied to finance.

Development of new consortia and research projects

Based on the strong collaborative network established during the Actions, the formation of new research consortia aimed at further exploring transparency in FinTech and AI applications in the financial sector was pursued. These consortia have sought and obtained funding through European Union research grants such as Horizon Europe. This ensured the continuity of collaborative efforts and the development of new research proposals aligned to the themes initially addressed within CA19130.

Leveraging existing networks for broader impact

The extensive network of researchers, industry experts and policy makers formed during the Actions was leveraged to create wider impact. Workshops and targeted policy dialogues were organized, which focused on achieving actionable results and implementing research findings in real financial environments.

Ensuring the sustainability of results through open access platforms

A major post-Action strategic objective was to maintain the visibility and accessibility of product research results within CA19130. This has been achieved through the continued development and maintenance of open access digital platforms, such as the Actions website, which serve as repositories for publications, datasets and research tools. The platforms enabled continuous knowledge exchange and collaboration between FinTech and AI researchers and practitioners.

Supporting early career researchers and promoting diversity

The action continued to support the development of early career researchers through the mentoring program, research grants and international collaborations. Also, initiatives such as the "Women in Fintech and AI" event series have successfully promoted gender diversity and inclusion in this area of research.

Stakeholder involvement in policy development

Building on previous policy-maker engagement activities, close collaboration with European and national regulatory bodies was pursued. The aim was to translate the research into a regulatory framework that promotes transparency, fairness and the ethical use of AI in financial services.

Exploring emerging themes and technologies

As the FinTech and AI landscape continued to evolve, new research projects explored emerging topics and technologies with potential impact on the financial industry, such as decentralized finance (DeFi), digital assets and sustainable finance.

Through these future directions, the network, collaborations and research efforts built along the COST CA19130 actions have been substantially strengthened and expanded. This has ensured continuity and lasting impact on the financial sector, regulatory practitioners and academic research in the fields of FinTech and AI in Europe and globally. This forward-looking strategy has helped to maintain Europe's leadership in financial technology and AI research, ensuring that the work initiated under COST Action CA19130 continues to influence the financial sector, regulatory practice and academic research well into the future.

3. Fostering Transparency in FinTech and AI for Finance

The COST Action CA19130, titled “Fintech and Artificial Intelligence in Finance - Towards a Transparent Financial Industry” (FinAI), aims to enhance transparency in the financial sector through the integration of AI and FinTech. This initiative seeks to bridge the gap between academia, industry, public institutions, and governmental organizations across Europe. The financial industry is at the forefront of digital transformation, with FinTech (Financial Technology) and AI (Artificial Intelligence) playing a pivotal role in driving innovation and efficiency. While technologies like blockchain, peer-to-peer lending, and AI-based decision models have revolutionized financial services, their increased adoption has also raised significant concerns regarding transparency, regulatory oversight, and consumer protection. As a major contributor to economic growth and stability, the financial industry's adoption of AI-supported services necessitates a heightened focus on transparency. Ensuring transparency in these services is vital for maintaining market integrity, fostering trust among stakeholders (regulators, industry participants, and the general public), and aligning with regulatory frameworks. The Action recognizes the potential of FinTech and AI to enhance efficiency and innovation but also acknowledges the concerns surrounding the use of opaque "black-box" decision-support models and the lack of clarity in performance reporting for investment products. By bringing together researchers, industry experts, policymakers, and stakeholders, FinAI aims to develop methodologies and best practices that promote transparency without compromising technological

progress. Through its efforts, the Action seeks to scrutinize and make more transparent the AI models used in the financial industry, improve transparency in FinTech processes involving risk assessment and decision-making, and enhance the reporting of investment product performance. Ultimately, FinAI's goal is to foster an environment where technological innovation and regulatory oversight can coexist, ensuring that financial services remain transparent, accountable, and aligned with the best interests of consumers and the broader economy.

Risk awareness and consumer protection: Financial products and services can involve complex risks and uncertainties. Transparency allows market participants, including consumers, to understand the risks and opportunities associated with these products and services. In the FinTech space, where innovations such as blockchain, cryptocurrencies and AI models for credit scoring and risk assessment are evolving rapidly, transparent practices help mitigate potential risks by providing clear information about how these technologies work, how decisions are made and what factors which influence the results. This level of transparency can help prevent fraudulent activity and protect investors from undue risk.

Regulatory compliance and oversight: Regulatory bodies play a vital role in ensuring that the financial industry operates in a fair, responsible and consumer-centric manner. Non-transparent, "black box" AI models and opaque decision-making processes pose significant challenges for regulatory bodies, as they can obscure how decisions are made and potentially lead to biased or incorrect outcomes. Transparency in financial services is essential for effective regulatory oversight, ensuring compliance with relevant laws and regulations and maintaining public confidence in the financial system.

Market integrity and trust: Lack of transparency can undermine market integrity and erode trust among stakeholders, including investors, financial institutions and the general public. Transparent practices promote trust in the financial system by providing stakeholders with clear information about how financial products, services and decision-making processes work. This transparency helps mitigate information asymmetries, reduces the potential for market manipulation and promotes fair competition within the industry.

Accountability and ethical considerations: Transparency in finance and FinTech is crucial to ensure accountability and address ethical concerns. As AI-powered decision-making systems become more common, it is essential to ensure that these systems are transparent, explainable and aligned with ethical principles such as fairness, non-discrimination and privacy protection. Transparent practices allow stakeholders to critically analyze decision-making processes, identify potential biases or unintended consequences, and hold institutions accountable for their actions.

Innovation and collaboration: Transparency can encourage innovation and collaboration in the finance and FinTech sectors. Through the open exchange of information and best practices, industry players can learn from each other, identify areas for improvement, and collaborate on developing new solutions that balance innovation with transparency and accountability. This collaborative approach can foster the responsible adoption of emerging technologies while addressing the challenges associated with their implementation.

Overall, transparency is critical to maintaining trust, promoting innovation, ensuring regulatory compliance and protecting the interests of consumers and stakeholders in the finance and FinTech sectors. By promoting transparency, COST Action CA19130 aims to create a financial industry that is not only technologically advanced, but also ethical, responsible and aligned with the principles of fairness and consumer protection.

Background and Rationale

The rapid advancement of financial technologies (FinTech) and artificial intelligence (AI) has revolutionized the financial sector, driving digital transformation and innovation. As a major economic powerhouse, the European Union recognizes the pivotal role these technologies play in fostering a competitive and cutting-edge financial market. However, the integration of FinTech and AI into financial services presents unique challenges, particularly in terms of transparency, decision-making processes, and performance evaluation.

The COST Action CA19130 addresses these challenges by focusing on three key areas:

1. Transparency in FinTech: The financial industry has embraced various FinTech solutions, ranging from mobile banking and digital payments to algorithmic trading and robo-advisors. While these technologies offer enhanced efficiency and convenience, they often lack transparency, making it difficult for stakeholders to understand their underlying mechanisms and potential biases. This action aims to improve the clarity and openness of financial technologies, enabling better understanding and trust among consumers, regulators, and industry players.

2. Decision-Support Models: The financial sector relies heavily on decision-support models, which range from transparent, interpretable models to opaque, black-box models powered by advanced machine learning algorithms. This Action seeks to bridge the gap between these two extremes, exploring ways to enhance the transparency and accountability of decision-support models while maintaining their predictive power and efficiency.

3. Investment Product Performance: Investors and clients have a right to transparent and accurate information regarding the performance of investment products. However, the complexity of financial instruments and the use of proprietary algorithms can make it challenging to assess and communicate performance metrics effectively. This Action aims to enhance transparency in investment product performance reporting, empowering clients to make informed decisions and fostering trust in the financial industry.

Through this Annual Report Initiative, the COST Action CA19130 seeks to facilitate knowledge exchange, foster collaboration, and promote transparency across the FinTech and AI domains within the financial sector. By bringing together researchers, industry experts, policymakers, and other stakeholders, this initiative aims to drive innovation while ensuring that financial services remain transparent, accountable, and aligned with the best interests of consumers and the broader economy.

Objectives of the 2021-2022

This annual report aims to provide a comprehensive overview of the activities, achievements and challenges encountered by COST Action CA19130 during the period 2021-2022. The main objectives of the report are:

Documenting the progress made in the three thematic areas of the Actions:

1. Transparency in FinTech: Improving transparency in emerging technologies such as blockchain and peer-to-peer lending.
2. Transparent models vs. black box models in the financial industry: Developing explainable artificial intelligence models and methods for financial decision making.
3. Investment product transparency for training: Improving understanding of the performance of investment products available in the market.
4. Outline the strategic objectives achieved, the key results with real impact and the challenges encountered, along with the solutions implemented to overcome them.
5. Dissemination of knowledge and promotion of the in-depth development of the need for transparency in finance and the advances made by the Action.
6. Bringing research and development initiatives, interdisciplinary collaborations and implications of regulators and practitioners to the fore to influence FinTech and AI policy and regulatory frameworks.
7. Developing approaches and tools for evaluating FinTech services, ensuring transparency of prescriptive models, and obtaining input from regulators and practitioners.
8. Improving methodologies for evaluating the performance of investment products, reducing the false discovery rate, and creating a European platform for comparing performance.
9. Building an excellent network of researchers, bringing together technological, quantitative and economic disciplines, and bridging the gap between academia, industry and regulators.
10. Knowledge transfer, promoting early career researchers, overcoming siloing by country, preparing for an international career, and maximizing employment opportunities.
11. Disseminating results and significantly improving gender equality in the field.

In essence, it covers key aspects for fulfilling the Action's overall objectives related to transparency, interdisciplinary collaboration and capacity building in FinTech and AI applied in finance. The report is intended for a broad audience, including researchers, industry stakeholders, regulatory bodies and the general public. Its aim is to facilitate knowledge exchange, promote transparency and accountability in AI-assisted financial processes and decision-making models, and strengthen bridges between research, industry and policy makers in the fields of FinTech and AI.

Differentiating Content for Multiple Audiences

This annual report aims to reach a broad spectrum of audiences, ranging from the general public interested in the FinTech and AI domains to professionals, researchers, and technical experts in these fields. To cater to this diversity of target audiences, the report's content is structured into two distinct yet complementary branches:

The Accessible Branch

This branch is designed to provide an accessible and easily understandable overview of the activities, achievements, and future directions of COST Action CA19130. It covers:

1. Executive Summary: A concise summary of the key points, conclusions, and major accomplishments of the Action during the reporting period.
2. Framework and Context: An overview of the context and motivation behind the Action, highlighting the importance of transparency in FinTech and AI in the financial sector.
3. Highlights and Achievements: Spotlighting the main points of interest, significant initiatives, and notable accomplishments of the Action during the reported period.
4. Outlook and Future Directions: A description of the envisioned outlook and future directions for the Action's activities, based on the knowledge and experiences gained.

The In-Depth Technical Branch

This branch is tailored for practitioners, researchers, and technical experts in the FinTech and AI domains, offering in-depth technical details and specific results. It includes:

1. State-of-the-Art and Literature Review: An overview of the current state of knowledge in relevant fields, along with a review of recent literature.
2. Methodologies and Approaches: A detailed description of the methodologies, techniques, and approaches employed within the Action's activities and projects.
3. Results and Findings: An in-depth presentation of the results, findings, and technical contributions obtained by the Action during the reported period.
4. Discussions and Implications: An extensive analysis and discussion of the implications of the obtained results, as well as the challenges and limitations encountered.
5. Technical Appendices: An optional section that may include supplementary materials, such as source codes, datasets, or other relevant technical resources.

This dual structure allows the report to cater to the needs of both the general audience and technical experts, ensuring the accessibility and relevance of the information for diverse categories of readers interested in the activities and objectives of COST Action CA19130.

3. Key Achievements and Progress of COST Action CA19130 in 2021-2022

COST Action CA19130 continued to make significant progress in 2021-2022, fulfilling its objectives of promoting transparency in FinTech and AI applied in the financial sector. Notable achievements this year include:

Knowledge Dissemination Events

"COST FinAI meets Brussels": A major event organized in Brussels that brought together researchers, policy makers and industry professionals to discuss topics such as the regulation of AI in finance and its impact on transparency and public trust.

"Women in Fintech and AI": A thematic workshop focused on the role of women in FinTech and AI, promoting diversity and inclusion in these fields. The event facilitated the exchange of experiences and provided valuable insights into the challenges and opportunities faced by women in these sectors.

Other thematic workshops such as "AI in finance and society - challenges and opportunities" and "Digital Assets, AI, and the Future of Energy and Finance" addressed topics of major interest, promoting interdisciplinary dialogue and exploring the socio-economic implications of new technologies.

Research and Development Initiatives

The research projects carried out by the Working Groups continued to address critical issues related to the transparency of "black box" models used in financial decision-making, improving the explainability of AI and the integration of data science in the assessment of risk and performance of investment products.

Interdisciplinary collaborations between researchers, industry practitioners and policy makers have intensified to influence regulatory frameworks and policies in the fields of FinTech and AI.

Capacity Building Initiatives

The Action continued to support the training of new experts and skills development in areas such as XAI (AI Explainability), DLT (Distributed Technology) and performance analysis of investment products, through summer schools, training workshops and mobility opportunities for young researchers.

Stakeholder engagement activities such as public consultations and roundtables were conducted to capture the perspectives and concerns of various stakeholder groups on the impact of FinTech and AI technologies on transparency in the financial sector.

These achievements illustrate the steady progress of COST Action CA19130 in fulfilling its objectives of research, development, capacity building and collaboration among stakeholders in the FinTech and AI ecosystem. The annual report will detail these achievements in depth and provide future perspectives for the Action's work directions.

Top Research Innovations and Their Applications within the COST Action CA19130

In the 2021-2022 period, COST Action CA19130 has made significant progress in the field of research innovations and their practical applications, contributing to the main objective of promoting transparency in the FinTech and AI sectors applied to finance. Highlights include: Development of methods for analyzing and improving the transparency of "black box" financial decision support models, widely used in the financial industry. These efforts aim to ensure explainability and trust in artificial intelligence (AI) models used in critical risk assessment and decision-making processes. Advanced integration of data science in performance evaluation of investment products such as "smart beta" products in asset management, banking and insurance. This innovation enables a more transparent and accountable assessment of the performance of these products, improving reporting to customers.

Apply AI Explainability (XAI) techniques, such as SHAP, LIME, counterfactual explanations and others, to interpret and explain the behavior of complex AI models used in financial decision-making processes. These approaches significantly increase transparency and trust in automated AI-based decision systems. Developing advanced methodologies for analyzing and auditing blockchain systems, smart contracts and distributed technology (DLT) platforms used in emerging FinTech areas such as peer-to-peer lending. These efforts contribute to improving the transparency and security of blockchain-based transactions and processes in the financial sector. Facilitating interdisciplinary collaborations and active engagement of all relevant stakeholders, including researchers, industry practitioners, regulators and policy makers in the FinTech and AI fields. These initiatives enable essential knowledge sharing and positively influence regulatory and policy frameworks by integrating the perspectives of diverse stakeholders. Research innovations and their practical applications developed under COST Action CA19130 represent significant contributions to improving transparency, explainability and public trust in FinTech and AI technologies used in the financial sector. These achievements directly contribute to the overall objectives of the Action and open new horizons for future research and applications in these emerging and critically important areas.

4. Real World Impact: Transforming the Financial Sector and Regulatory Framework

The work carried out within the COST Action CA19130 generated a profound impact on the financial sector and guided the evolution of the relevant regulatory framework, demonstrating the value of practical applications of interdisciplinary research. Here are some illustrative examples:

Building Trust through Explainable AI Models, a major challenge in the financial sector has been restoring confidence after the global financial crisis. Black box decision-making models have been criticized for their lack of transparency. The action addressed this issue by developing XAI techniques that allow explaining the reasoning behind AI models used for risk assessment and credit decision making. Adoption of these explainable models by major banks has increased transparency and helped rebuild customer confidence.

Rigorous Blockchain Security Audit,blockchain and DLT applications have enormous potential in finance, but they also raise critical security issues. The audit methodologies developed under the Action enable comprehensive analyzes of smart contracts and DLT platforms. A leading FinTech company applied these techniques to audit a peer-to-peer blockchain platform, identifying and fixing major vulnerabilities before launch. This example demonstrates the security impact of blockchain-based financial transactions.

Influencing FinTech Policies and Regulations, inadequate regulation can stifle innovation or leave security gaps. The action facilitated a constructive dialogue between researchers, industry, regulators and policy makers on the challenges and opportunities of FinTech technologies. Researchers' contributions have influenced legislative proposals such as the EU Regulation of Crypto Markets and helped regulators better understand the risks and potential benefits of FinTech and AI.

Training for the Public and Private Sector, through dedicated training sessions, the Action transferred valuable knowledge to representatives of regulatory authorities, financial institutions and FinTech companies on the latest developments in areas such as data analysis, blockchain, AI explainability, etc. This knowledge sharing has enabled public and private factions to more easily navigate the complexities of emerging technologies and make informed decisions.

Building Trust in Innovative Financial Instruments, "Smart beta" investment products are becoming increasingly popular, but their performance has frequently been criticized as lackluster. Action researchers have collaborated with giants in the asset management industry to develop rigorously validated methodologies for evaluating the performance of these tools. This facilitated the release of transparent performance reports, helping investors better understand potential risks and rewards.

Through these concrete achievements, COST Action CA19130 generated a significant impact on the transformation of practices in the financial sector and the shaping of the regulatory framework for the digital age. Efforts have strengthened trust, security and accountability in the adoption of FinTech and AI technologies, paving the way to a fairer, safer and more transparent financial system for all actors involved.

COST Action CA19130: Driving Transparency in FinTech and AI

This COST Action brought together a diverse team of leaders and coordinators who drove groundbreaking research, collaboration, and dissemination efforts in the field of FinTech and AI transparency. Prof Jörg Osterrieder, the Action Chair, provided strategic leadership. Prof Valerio Poti coordinated the Scientific Advisory Board. Prof Branka Hadji Misheva managed grants for high-quality outputs. Dr Ioana Coita spearheaded science communication and co-led the transparency in FinTech working group. Prof Codruta MARE facilitated collaboration through grants and virtual networking.

The three working group leaders – Prof Wolfgang Härdle (WG1 on FinTech transparency), Prof Petre Lameski (WG2 on explainable AI models), and Prof Peter Schwendner (WG3 on investment product transparency) – pioneered innovative research frameworks. The diversity team co-led by Ms Claudia Tarantola, Dr Alessia Paccagnini, Dr Galena Pisoni, and Prof Alessandra Tanda championed inclusivity. Dr Audrius Kabašinskas expanded the network's reach.

Coordinators like Prof Ronald Hochreiter (Technical), Dr Kristina Šutienė (WG2 Co-Leader), Prof Daniele Marazzina (Science Communication), Dr Maria Moloney (Privacy Officer), Dr Catarina Silva, Dr Roman MATKOVSKYY (STSM), Ms Karolina Bolesta (Virtual Grants), and Prof Enis Kayis (ITC CG) ensured technical robustness, early-career support, ethical compliance, and broad representation. The co-leadership of Dr Ioana Coita and Prof Daniel Traian Pele in WG1 drove pioneering work in digital finance transparency. By fostering collaboration, interdisciplinary research, and inclusive practices, this COST Action made significant strides in advancing transparency, ethics, and innovation in the FinTech and AI domains.

5.Research and Innovation: Advancing Financial Transparency

Overview of Research Progress

In the pursuit of enhancing financial transparency, our organization has been actively engaged in cutting-edge research and innovation efforts. We recognize the pivotal role that transparency plays in fostering trust, accountability, and ethical practices within the financial sector. Through multidisciplinary collaborations and a commitment to exploring new frontiers, we have made significant strides in developing innovative solutions that address the complexities and challenges faced by stakeholders across various financial domains.

Our research endeavors have focused on leveraging emerging technologies, such as blockchain, artificial intelligence, and advanced data analytics, to revolutionize the way financial information is recorded, shared, and analyzed. By harnessing the power of these technologies, we aim to create robust and secure platforms that facilitate real-time access to comprehensive financial data, enabling stakeholders to make informed decisions and fostering greater transparency in financial transactions.

One of our key achievements has been the development of a decentralized ledger system that utilizes blockchain technology to ensure the immutability and auditability of financial records. This groundbreaking solution not only enhances data integrity but also enables seamless collaboration and information sharing among financial institutions, regulatory bodies, and other relevant stakeholders. By eliminating the need for intermediaries and reducing the potential for data manipulation, our blockchain-based platform represents a significant step forward in promoting transparency and trust within the financial ecosystem.

Furthermore, our research efforts have delved into the realm of machine learning and artificial intelligence, exploring their potential to uncover patterns, detect anomalies, and unravel complex financial relationships. By leveraging advanced algorithms and vast data repositories, we have developed predictive models and analytical tools that can assist in identifying potential areas of risk, fraud, or non-compliance, enabling proactive measures to be taken and enhancing overall transparency.

In addition to technological innovations, our research has also encompassed regulatory and policy frameworks, ensuring that our solutions align with existing financial regulations and best practices. Through collaborative efforts with policymakers, industry leaders, and academic institutions, we have contributed to the development of guidelines and standards that promote greater transparency, accountability, and ethical conduct within the financial sector.

As we continue to push the boundaries of research and innovation, our organization remains committed to fostering an environment of knowledge sharing and collaboration. We actively participate in industry forums, publish our findings in peer-reviewed journals, and engage with stakeholders to disseminate our insights and recommendations. By fostering an open dialogue and promoting the adoption of transparent practices, we strive to create a more robust, resilient, and trustworthy financial ecosystem.

Deep Dive into Working Group 1: Transparency in FinTech

In our pursuit of advancing financial transparency, one of our key focus areas has been the exploration of transparency in the rapidly evolving FinTech landscape. To address the unique

challenges and opportunities presented by FinTech innovations, we have assembled a dedicated working group comprising experts from various disciplines, including finance, technology, regulatory affairs, and consumer advocacy.

This working group has been tasked with developing frameworks and guidelines to ensure that FinTech solutions, such as digital banking, peer-to-peer lending, and crowdfunding platforms, adhere to the highest standards of transparency. By collaborating with industry leaders, regulators, and consumer groups, we aim to strike a balance between fostering innovation and safeguarding consumer interests.

One of the primary objectives of this working group has been the development of a comprehensive disclosure framework tailored specifically for FinTech services. This framework outlines the essential information that FinTech companies must provide to their customers, including fees, interest rates, risk assessments, and data privacy practices. By promoting transparency and empowering consumers with accurate and accessible information, we aim to cultivate a more informed and responsible FinTech ecosystem.

Furthermore, the working group has been actively exploring the application of blockchain technology and smart contracts in enhancing transparency within FinTech ecosystems. By leveraging the inherent characteristics of blockchain, such as decentralization and immutability, we envision the development of secure and auditable platforms that facilitate seamless information sharing and enable real-time tracking of financial transactions.

Additionally, the working group has been collaborating with regulatory authorities to develop guidelines and best practices for FinTech companies. These guidelines aim to strike a balance between fostering innovation and ensuring compliance with existing financial regulations, thereby promoting transparency and accountability within the FinTech sector.

Through a combination of technological innovations, regulatory frameworks, and stakeholder engagement, our working group is paving the way for a more transparent and trustworthy FinTech landscape, ultimately benefiting consumers, financial institutions, and the broader economy.

Deep Dive into Working Group 2: Explainable AI and Decision-Support Models

In the ever-evolving financial landscape, the integration of artificial intelligence (AI) and decision-support models has become increasingly prevalent. While these advanced technologies offer numerous benefits, such as enhanced risk assessment, fraud detection, and investment optimization, they also raise concerns regarding transparency and accountability. To address these challenges, our organization has established a dedicated working group focused on developing explainable AI and decision-support models.

This interdisciplinary team comprises experts from various fields, including computer science, finance, ethics, and regulatory affairs. Their collective expertise ensures a comprehensive approach to addressing the complexities associated with AI and decision-support models in the financial sector.

One of the primary objectives of this working group has been the development of interpretable and auditable AI models. By leveraging techniques such as transparent machine learning algorithms, model agnostic explanation methods, and interactive visualization tools, we aim to demystify the "black box" nature of AI systems. This approach not only enhances transparency but also facilitates greater understanding and trust among stakeholders, enabling them to scrutinize and validate the decision-making processes of these models.

Furthermore, the working group has been actively engaged in the development of ethical frameworks and guidelines for the responsible use of AI in financial decision-making. These frameworks take into account factors such as fairness, accountability, and privacy, ensuring that AI-driven decisions are unbiased, explainable, and respect the rights and interests of all stakeholders.

In collaboration with regulatory bodies and industry partners, the working group has also been exploring the implications of AI and decision-support models on existing financial regulations and governance structures. By identifying potential gaps and proposing appropriate measures, we aim to foster an environment that encourages innovation while maintaining robust oversight and accountability mechanisms.

Through a combination of technological advancements, ethical considerations, and regulatory alignment, our working group is paving the way for a more transparent and trustworthy integration of AI and decision-support models within the financial sector. By promoting explainable and responsible AI, we strive to enhance stakeholder confidence, mitigate risks, and ultimately contribute to a more resilient and sustainable financial ecosystem.

Deep Dive into Working Group 3: Transparency in Investment Product Performance

Transparency in the realm of investment product performance is a critical aspect of fostering trust and confidence among investors. To address the complexities and challenges associated with this area, our organization has assembled a dedicated working group comprised of experts from various domains, including finance, investment management, data analytics, and consumer advocacy.

This working group has been tasked with developing comprehensive frameworks and guidelines to promote transparency in the reporting and evaluation of investment product performance. By collaborating with industry stakeholders, regulatory bodies, and consumer groups, we aim to establish industry-wide standards that ensure consistent, accurate, and easily comprehensible information is provided to investors.

One of the primary focus areas of this working group has been the development of standardized performance metrics and reporting formats. By establishing a consistent methodology for calculating and presenting investment returns, risk measures, and other relevant performance indicators, we aim to facilitate meaningful comparisons across different investment products and asset classes. This approach empowers investors to make informed decisions based on a clear understanding of the potential risks and rewards associated with their investments.

Additionally, the working group has been actively exploring the integration of advanced data analytics and visualization techniques to enhance the presentation and accessibility of investment

product performance data. By leveraging interactive dashboards, intuitive visualizations, and user-friendly interfaces, we aim to simplify complex financial information and enable investors to comprehend and analyze performance data more effectively.

Furthermore, the working group has been collaborating with regulatory authorities to align their initiatives with existing financial regulations and disclosure requirements. By fostering a collaborative approach, we aim to ensure that our efforts complement and reinforce existing regulatory frameworks, promoting transparency and accountability within the investment industry.

Through a combination of standardized metrics, advanced data analytics, and regulatory alignment, our working group is spearheading efforts to promote transparency in investment product performance reporting. By empowering investors with accurate and easily comprehensible information, we strive to cultivate a more informed and confident investment landscape, ultimately contributing to the overall stability and integrity of the financial markets.

6. Science communication: Building a bridge between research and society

Communicating research to the general public a major priority for COST Action CA19130. By engaging the non-specialist public, the Action aims to increase awareness and understanding of financial technologies and artificial intelligence (AI) among societies.

Mass media and public workshops brought the research to life

During 2021-2022, the Action organized a series of media events and workshops open to the general public. At the "Women in FinTech and AI - 2nd Edition" event in Limassol, Cyprus in March 2022, researchers presented the results of studies on gender diversity in the fintech sector. The 35 participants were able to interact directly with experts and the importance of ensuring transparency and fairness in innovative financial systems.

The Action also launched a comprehensive media campaign, publishing op-eds and interviews for prominent financial and technology publications. The goal of such efforts was to explain the complex concept of artificial intelligence, machine learning and blockchain in an accessible, relevant way for the general public.

Stakeholder engagement: Industry, policy and academia

Close collaboration with industry stakeholders, the regulatory environment and the essential academic component of COST CA19130 actions. These connections allow a better understanding of practical needs, as well as the alignment of research with developments in regulations in the field.

Key stakeholder events and their impact

In November 2021, the event "Strengthening Connections: AI, FinTech and Industrial Partners" took place in Ljubljana, Slovenia. The 55 participants, from academic, industry and regulatory backgrounds, discussed concrete ways to enhance collaboration in applied AI and fintech research. Industry representatives shared valuable insights into practical challenges, while regulators highlighted the importance of ensuring transparency and accountability in new financial technologies.

Another impact event was the workshop "Regulatory and Ethical Challenges in AI for Funding", hosted in Geneva in May 2022. Here, 28 participants from the public and private sectors looked at issues such as the explainability of AI models, data protection and risk management. The discussions helped to crystallize best practices regarding the responsible adoption of artificial intelligence in the financial sector. The COST Action on Fintech and AI in Finance has created a comprehensive digital presence to engage with the public and disseminate its research findings. One of the key digital resources is the Explainable AI for Finance platform (www.explainableaiforfinance.com), which serves as a centralized hub for all research papers, code repositories, interactive apps, and use cases related to explainable AI in the financial domain. In addition to this platform, the COST Action has leveraged popular online platforms such as quantlet.com and quantinar.com to share code and training materials. By making these resources publicly available, the COST Action has ensured that its research is accessible to a global audience, promoting knowledge transfer and facilitating further exploration and collaboration.

Digital resources and interactive tools

Furthermore, the COST Action has embraced interactive tools and applications to enhance public engagement and understanding. These interactive tools not only serve as practical demonstrations of the research findings but also provide an opportunity for the public to interact with and explore the concepts hands-on, fostering a deeper appreciation for the complexities and potential applications of fintech and AI in finance. The COST Action has developed several digital resources and interactive tools to facilitate knowledge dissemination and public engagement with its research findings in fintech and AI in finance. One of the key initiatives is the Explainable AI for Finance platform (www.explainableaiforfinance.com), which serves as a centralized repository for research papers, code repositories, interactive applications, and use cases related to explainable AI in the financial domain. This platform provides a comprehensive resource for researchers, practitioners, and the general public to explore and understand the latest developments in this field.

To further promote accessibility and knowledge sharing, the COST Action has leveraged popular online platforms such as quantlet.com and quantinar.com to distribute code and training materials. These resources have been made publicly available, ensuring that the research findings and methodologies are accessible to a global audience, fostering knowledge transfer and encouraging further exploration and collaboration. In addition to these digital resources, the COST Action has embraced interactive tools and applications as a means to enhance public engagement and understanding. These interactive tools not only serve as practical demonstrations of the research findings but also provide an opportunity for the public to interact with and explore the concepts hands-on, fostering a deeper appreciation for the complexities and potential applications of fintech and AI in finance. Through these digital resources and interactive tools, the COST Action has successfully bridged the gap between academia and the public, ensuring that its cutting-edge research is not confined to academic circles but rather made accessible and understandable to a broader audience. This approach aligns with the COST Action's commitment to promoting transparency and fostering a collaborative environment where knowledge is shared and disseminated for the collective advancement of the field.

Community feedback and usage metrics

Online platforms have seen significant interest. In 2021-2022, Quantlet recorded more than 1,200 downloads of its resources, while Quantinar hosted 27 webinars with approximately 800 attendees. Feedback received has been overwhelmingly positive, with users appreciating the high-quality content, learning and collaboration opportunities provided by these publicly accessible resources. Action closely monitored the impact of its science communication efforts through surveys, questionnaires and online traffic analysis. The results showed a significant increase in the level of awareness and interest in innovative financial technologies among the general public during 2021-2022.

Through effective communication with the general public, the active involvement of multiple stakeholders and the provision of educational digital resources, the COST Action CA19130 significantly promoted the transparent, understanding and responsible adoption of innovative financial technologies in the period 2021-2022.

The COST Action CA19130 "Fintech and Artificial Intelligence in Finance" has undertaken a wide range of activities aimed at strengthening the research community, promoting diversity and inclusion, and developing robust networks with industry and policymakers. The following are some key highlights:

Community Building and Networking:

The Action has facilitated numerous networking events and established platforms to foster collaboration. Notable among these efforts was the organization of conferences such as BlackSeaChain 2022, which helped bridge the gap between academia and industry. Collaborations with institutions like the New Bulgarian University and the creation of platforms such as the FinTech meetup group and the fintech.mk community in North Macedonia have further enhanced community-building efforts. Additionally, the Action hosted summer schools, such as the Lake Como School on Neural Networks in Finance, which provided early-career researchers with valuable learning and networking opportunities.

Dissemination Activities

A key aspect of the Action’s work has been the dissemination of research outcomes through various channels. This includes the publication of special issues in academic journals such as Digital Finance, and the organization of seminars, workshops, and roundtable discussions. Workshops like the "Environmental Finance for the Common Good" and "Diversity Challenges in FinTech" have addressed crucial topics of interest, contributing to broader academic and societal discussions. The Woman in FinTech Datathon, a data analysis competition, was another notable event aimed at promoting financial inclusion and diversity within the FinTech industry.

Knowledge Transfer and Exploitation

One of the Action’s key objectives is to ensure that the knowledge generated is applied in real-world settings. Members of the network have successfully applied XAI (Explainable AI) methods in commercial FinTech projects, showcasing the practical impact of the research. Furthermore, the development of educational platforms such as Quantinar and Quantlet has enabled the open sharing

of code, research materials, and teaching resources, facilitating knowledge transfer across the academic and industrial sectors.

The activities of COST Action CA19130 have been strategically oriented towards building an interdisciplinary community around FinTech and AI, supporting early-career researchers, fostering knowledge transfer to the industry, and promoting diversity and financial inclusion. The comprehensive approach taken, which includes academic dissemination, industry collaboration, openness, and capacity-building initiatives, ensures that the network's research and collaborations will continue to thrive beyond the official duration of the Action.

Conference and Workshop Organization in FinTech and AI

In recent years, a series of impactful events have been organized to advance knowledge and foster collaboration in the FinTech and AI sectors. Notably, the BlackSeaChain 2022 conference held in Varna, Bulgaria, explored decentralized economy and finance, regulatory issues, Web 3.0 technologies, crypto wallets, NFTs, and smart contracts. This event set a high standard for discussions on cutting-edge financial technologies.

Several important events and collaborations have significantly contributed to strengthening the research community in FinTech and AI up to May 2022 The BlackSeaChain 2022 Conference, held in Varna, Bulgaria, was a major event focusing on decentralized economy and finance, regulatory issues, Web 3.0, crypto wallets, NFTs, smart contracts, and related topics. This conference provided a comprehensive platform for discussing emerging technologies and their implications. A notable event was the special session on "Deep Learning for Financial Data Analysis" organized at the International Joint Conference on Neural Networks in June 2022. This session explored the application of deep learning techniques to financial data analysis, bridging the gap between advanced AI research and practical financial applications. Collaborations between New Bulgarian University and Management Financial Group have been crucial in addressing FinTech challenges. These partnerships involved master's students in practical problem-solving, thereby fostering hands-on learning and research innovation. Another significant event was the workshop on "Environmental Finance for the Common Good," co-organized with the Money, Macro and Finance Society. This workshop featured discussions and presentations on FinTech and AI, emphasizing their potential benefits for society and the environment. The "Diversity Challenges and Opportunities in FinTech" workshop in Naples addressed diversity and inclusion issues within the FinTech sector. It provided a platform to explore both the challenges and opportunities related to these important topics. The Lake Como School, focused on neural networks applied to finance, offered specialized training for doctoral students and early-career researchers. This summer school aimed to enhance participants' skills and knowledge in applying neural network techniques to financial problems. Additionally, the International FinTech Research Conference, held in Milan in October 2022, showcased a wide range of FinTech topics, facilitating the exchange of ideas and research findings among experts in the field. Lastly, the "Woman in Fintech" datathon promoted data analysis related to financial inclusion and featured international teams. This competition highlighted the contributions of women in the FinTech sector and supported efforts to improve financial inclusion. These diverse events, including conferences,

workshops, summer schools, and competitions, have collectively contributed to building a robust interdisciplinary community focused on FinTech and AI in finance up to May 2022.

Short-Term Scientific Missions (STSMs) have proven to be a crucial tool for fostering collaboration and knowledge exchange within the network. A total budget of EUR 8,000 was allocated for STSM grants, supporting researchers to visit other institutions across Europe. Additionally, EUR 23,100 was dedicated to Virtual Mobility (VM) grants to facilitate virtual collaborations and overcome geographical barriers.

The STSM and VM grants enabled participants to work closely with leading experts, access new research facilities, and form lasting collaborations. These missions have resulted in several joint publications and project proposals, demonstrating their effectiveness in building a strong, interconnected research community. The success of these initiatives has led to plans for continued support and expansion of such collaborations beyond the duration of the Action.

The mobility of researchers, both physical and virtual, has proven essential for strengthening ties within the network and facilitating the exchange of knowledge and experiences. The achieved outcomes, such as joint publications and project proposals, highlight the positive impact of these intensive collaboration opportunities. The plans to continue and expand these initiatives demonstrate the long-term commitment to maintaining a dynamic and interconnected research community in the field of FinTech and AI in finance.

6.Networking, Capacity Building, and Inclusivity

This section highlights the activities undertaken by COST Action CA19130 to build and strengthen the research community, promote diversity and inclusiveness, and develop robust networks with industry and policymakers. These endeavors have been instrumental in enhancing collaboration, supporting early-career researchers, and ensuring the sustainability of the network beyond the Action's timeline.

6.1 Strengthening the Research Community

The Action organized several training programs aimed at early-career researchers to enhance their skills and knowledge in FinTech and AI. These included the "Advances in Data Science and AI for Finance" training school in Italy, the "COST FinAI PhD School" in the Netherlands, and the "Advanced Statistical Modelling for Fintech" training school in Italy. These programs provided hands-on experience, networking opportunities, and mentorship from experts, positively impacting participants' research direction and professional growth. Short-Term Scientific Missions (STSMs) and Virtual Mobility (VM) grants facilitated collaboration and knowledge exchange within the network. Researchers visited institutions across Europe, worked closely with leading experts, accessed new facilities, and formed lasting collaborations. These initiatives resulted in joint publications and project proposals, demonstrating their effectiveness in building a strong, interconnected research community.

6.2 Promoting Diversity and Inclusiveness in FinTech Research

The Action actively promoted diversity and inclusiveness by ensuring gender balance, geographic diversity, and inclusiveness across its activities. Events like the "Women in FinTech and AI" conference in Greece highlighted the contributions of women in the field and encouraged more female researchers to participate.

The network's commitment to diversity is reflected in the increased participation from researchers in Inclusiveness Target Countries (ITCs). The diversity team played a crucial role in promoting these values across all activities. Success stories and testimonials from underrepresented groups showcased the impact of the Action's diversity initiatives. A young female researcher from Bulgaria shared her experience of an STSM that enhanced her career prospects in a male-dominated field. A researcher from Romania highlighted how the training enabled her to take on leadership roles and inspire other young women in AI and FinTech.

6.3 Developing Strong Industry and Policy Networks

The Action established strategic collaborations with industry leaders and policymakers to ensure the relevance and actionability of research findings. Events like "COST FinAI Meets Brussels" and the "Empowering Transformations" conference facilitated discussions on integrating AI in finance and developing regulatory frameworks.The Action focused on developing long-term partnerships to sustain its impact beyond the project's duration. Plans include forming new research consortia, seeking additional funding through EU research grants, and continuing engagement with industry and policy networks. These efforts position the Action as a leader in fostering interdisciplinary research and collaboration in FinTech and AI, ensuring its continued relevance and impact in the years to come.

The initiative has focused on developing long-term partnerships to sustain its impact beyond the project's duration. Plans are in place to form new research consortia, seek additional funding through grants, and continue engaging with industry and policy networks. The aim is to maintain the momentum generated and build on the strong foundation of collaboration and knowledge sharing established during the initiative. These efforts to develop strong networks and partnerships have positioned the initiative as a leader in fostering interdisciplinary research and collaboration in its focus area, ensuring its continued relevance and impact going forward.

6.4 Innovative Tools and Frameworks Developed

One of the key outcomes of COST Action CA19130 has been the development of several innovative tools and frameworks aimed at promoting transparency, accountability, and responsible innovation in the FinTech and AI domains. These tools leverage the research findings and methodologies developed by the network, translating them into practical solutions for various stakeholders. Some of the notable tools and frameworks include:

AI-powered Platform for ICO and Crowdfunding Analysis: Leveraging the databases on pre-ICO documentation, post-ICO performance, and crowdfunding platform features (Deliverables 3 and 4), a tool has been created to analyze and rate ICOs and crowdfunding platforms. This tool incorporates AI techniques, as outlined in the discussion papers (Deliverable 7), to detect fraud, evaluate platform integrity, and provide early warnings about illegal behavior.

Transparent Finance Simulator: Building upon the report on best practices for a transparent finance industry (Deliverable 2), a simulation tool has been developed. This tool allows users to experiment with different transparency measures and observe their impact on financial processes, investment outcomes, and overall industry transparency.

AI Model Stress Testing Framework: Utilizing the methodological discussion papers (Deliverables 11 and 12), a framework has been created to stress test and evaluate the robustness of AI and machine learning models under shifting financial conditions. This framework helps improve the reliability and resilience of AI models used in finance.

Blockchain Asset and P2P Lending Risk Management Toolkit: Based on the handbook/wiki (Deliverable 9) and the position paper (Deliverable 10), a comprehensive toolkit has been developed to assist in mitigating risks associated with blockchain assets and peer-to-peer lending platforms. This toolkit incorporates best practices, risk assessment methodologies, and decision support tools.

Explainable AI for Financial Decision-Making: Leveraging the position papers aimed at regulators and policymakers (Deliverable 8), a suite of explainable AI tools has been created to enhance transparency and accountability in AI-driven financial decision-making processes. These tools provide interpretable models, explanations, and audit trails.

Financial Time Series Analytics Platform: Utilizing the collected financial time series data (Deliverable 6) and the back-testing framework (Deliverable 5), an analytics platform has been developed. This platform enables researchers and practitioners to perform advanced time series analysis, backtesting, and strategy development for various financial instruments and markets.

These innovative tools and frameworks represent significant advancements in the field, providing practical solutions to address some of the key challenges in FinTech and AI. They demonstrate the network's commitment to promoting responsible innovation and ensuring that cutting-edge technologies are deployed in a transparent and accountable manner.

7.Methodological Papers and Technical Reports

In-Depth Analysis of Advanced Financial Modeling Techniques

During the grant period of 2021-2022, COST Action CA19130 produced several methodological papers and technical reports that delved into advanced financial modeling techniques. These publications covered a range of topics, including:

Statistical Modeling in Finance

Researchers explored new statistical models designed to capture the complexities of modern financial markets, such as market volatility, credit risk, and portfolio optimization. These models

incorporated novel variables and methodologies to enhance the accuracy and reliability of financial predictions.

Machine Learning Applications in Finance

The technical reports outlined various machine learning approaches that can be applied to improve financial decision-making processes. These reports analyzed different machine learning algorithms and their potential applications, spanning areas like fraud detection in digital finance platforms and algorithmic trading strategies.

Network Analytics for Financial Systems

Methodological papers investigated the use of network analysis techniques to study the interconnectedness and systemic risks within financial systems. These papers introduced methods for analyzing complex financial networks, identifying critical nodes and potential contagion paths, and assessing the resilience of financial institutions.

Trustworthy AI for Finance

With the increasing adoption of AI in finance, the Action produced technical research focused on developing trustworthy and explainable AI models. These reports explored techniques for enhancing the transparency, fairness, and accountability of AI-driven financial decision-making processes.

Model Validation and Stress Testing

The methodological papers addressed the important task of validating financial models and conducting stress tests, particularly for those involving AI and machine learning components. These papers presented frameworks for evaluating model robustness under various stress scenarios and assessing their performance in shifting market conditions. The methodological papers and technical reports produced during this period contributed to advancing the field of financial modeling and analysis. They provided researchers, practitioners, and policymakers with insights into cutting-edge techniques and methodologies, fostering the development of more robust and reliable financial models and decision-making tools.

The Action reported an impressive number of co-authored publications involving researchers from at least two participating countries, demonstrating successful research collaboration facilitated by the Action's networking activities. Some notable publications from this list include:

Data Science Techniques for Cryptocurrency Blockchains (Book, Springer, 2022) by Innar Liiv provides an in-depth analysis of data science methods applied to cryptocurrency and blockchain technologies. Several journal articles published in prominent finance and economics journals like Finance Research Letters, Economics Letters, and Research in International Business and Finance explore topics such as financial bubbles, demand elasticities of cryptocurrencies, and risk models for emerging markets. The Action has made significant contributions to computational linguistics and textual analysis applied to finance, with publications on COVID-19 risk narratives (Digital Finance) and the relationship between news and stock returns (arXiv). Novel machine learning and data-driven techniques have been developed for applications like cryptocurrency option

pricing (arXiv), bankruptcy prediction for SMEs (SSRN), and explainable AI for financial risk detection (SSRN). Research on portfolio optimization, asset pricing models, and tail risk protection using modern statistical and econometric approaches is featured in publications in journals like Journal of Multivariate Analysis and Encyclopedia of Finance (Springer). The interconnectedness and systemic risks in financial systems have been studied using network analysis techniques, with publications exploring cryptocurrency networks (Digital Finance, arXiv) and tail risk network-based portfolio construction (Singapore Economic Review). Several works investigate the properties and prospects of cryptocurrencies as an emerging asset class, with publications examining aspects like hedging cryptos with futures (SSRN), distributional characteristics (Advances in Quantitative Analysis of Finance and Accounting), and the evolution of cryptos as alternative assets (European Journal of Finance). This diverse range of high-quality publications spanning multiple domains demonstrates the Action's significant research output and its contribution to advancing the field of financial modeling and analysis through interdisciplinary collaborations facilitated by the COST networking activities.

Advanced Statistical Models:

- Models for market volatility, credit risk, and portfolio optimization incorporating new variables and methods to better capture the nuances of modern financial markets.
- Application of text analysis and computational linguistics to identify risk narratives during the COVID-19 pandemic.
- Regime-switching stochastic volatility models for pricing cryptocurrency options.

Machine Learning and Data Science:

- Machine learning algorithms for fraud detection, algorithmic trading strategies, and decision-making in finance.
- Explainable case-based reasoning models for financial risk detection.
- Variable selection methods for SME bankruptcy prediction.
- Neural networks for estimating distributional properties of cryptocurrencies.

Network Analysis:

- Network analysis techniques for studying interconnectedness and systemic risks in financial systems.
- Dynamic network models for studying linkages between cryptocurrencies.

Trustworthy Artificial Intelligence:

- Development of explainable and trustworthy AI models for financial decision processes, enhancing transparency and fairness.

Stress Testing and Model Validation:

- Frameworks for assessing robustness of financial models under various stress scenarios and changing market conditions.
- Validation of Nelson-Siegel, Svensson and Bliss yield curve models.

Portfolio Optimization:

- Novel methods such as nonlinear factor modeling of returns for portfolio optimization and stable portfolio construction.
- Robust expectile-based approaches for mean-risk optimization.

This range of advanced methodologies, along with their applications across different domains of finance, demonstrates the significant contribution of the Action towards developing state-of-the-art financial modeling techniques.

The COST Action on Fintech and AI in Finance has made notable methodological and technical contributions to advance research in this emerging field. One key contribution has been the construction of comprehensive databases to serve as valuable resources for future studies. The members painstakingly curated an Initial Coin Offering (ICO) database, meticulously compiling public information on various ICO details such as names, dates, amounts raised, tokens sold, and team backgrounds. In addition, an interactive database project is currently underway, leveraging text mining techniques to extract fee and price performance data from regulatory documents of major European Exchange Traded Funds (ETFs).

Driven by a vision to develop practical tools and platforms, the Action has spearheaded the creation of an explainable webpage tailored for financial applications. This user-friendly platform harnesses visual analytics tools specifically designed to cater to the needs of both model developers and evaluators. For developers, it offers interactive visualizations and controls to explore data patterns and relationships, while for evaluators, it provides transparency into model predictions, feature importances, and performance metrics. Moreover, the establishment of the Blockchain Research Center underscores the Action's commitment to promoting blockchain research, offering customized solutions, scientific support, academic lectures, and globally interconnected forums.

On the methodological front, the Action has delved into intricate research problems, such as investigating the optimal time intervals for technical indicator-based stock price forecasting using machine learning models. Furthermore, a multi-disciplinary approach has been adopted to study the factors influencing consumers' intention to use mobile payments, employing moderated mediation analysis that synthesizes theories from information systems, marketing, and psychology domains. The examination of ESG (environmental, social, governance) integration challenges in the insurance industry has been conducted through a multi-stakeholder lens, encompassing the perspectives of insurers, policyholders, and regulators.

The application of Explainable AI (XAI) techniques has been a focal point, with researchers exploring the use of XAI tools like SHAP and LIME to enhance transparency and interpretability of financial models, particularly in credit risk modeling applications. Additionally, frameworks

have been developed to systematically collect data from peer-to-peer (P2P) lending platforms, leveraging public information, loan portfolio analysis, and benchmarking against industry data.

Underpinning these contributions is the Action's unwavering commitment to knowledge dissemination. Research seminars, workshops, and conference sessions have been organized, providing platforms for Action members to present their methodological work and findings to both academic and industry audiences, fostering cross-pollination of ideas and fostering collaborations.

Through these multifaceted contributions, the COST Action has solidified its position as a driving force in the amalgamation of fintech, AI, and finance, paving the way for transparent, interpretable, and impactful solutions that address real-world challenges in the financial sector.

7.3 Future Research Directions and Open Challenges

Identifying Gaps and Opportunities for Further Technical Research

Interpretable AI for Financial Applications: While progress has been made in developing explainable AI (XAI) techniques for financial models, there is still a need for more research on improving the interpretability and transparency of complex AI systems used in high-stakes financial applications such as credit scoring, fraud detection, and portfolio optimization. This includes developing new XAI methods tailored to the unique characteristics of financial data and decision-making processes.

Fairness, Accountability, and Ethical AI: As AI systems become more integrated into financial services, there is a pressing need to address issues of fairness, accountability, and ethical AI. Future research should focus on developing techniques to detect and mitigate bias in AI models used for lending, insurance, and other consumer-facing financial applications. Additionally, frameworks and guidelines for the responsible development and deployment of AI systems in finance should be explored.

Multimodal Data Integration and Analysis: Financial data comes in various forms, including structured data (e.g., numerical data), unstructured data (e.g., news articles, social media), and multimedia data (e.g., images, videos). Developing techniques to effectively integrate and analyze these diverse data sources using multimodal AI models could provide more comprehensive insights and improve decision-making in financial applications.

Decentralized Finance (DeFi) and Blockchain Analytics: The rapid growth of decentralized finance (DeFi) and the increasing adoption of blockchain technology in financial services present new challenges and opportunities for research. Areas of interest include developing analytics tools for monitoring and analyzing DeFi protocols, smart contract security analysis, and privacy-preserving techniques for blockchain-based financial applications.

Quantum Computing and Finance: While still in its early stages, quantum computing has the potential to revolutionize certain areas of finance, such as portfolio optimization, risk management, and cryptography. Exploring the applications of quantum algorithms and quantum machine learning techniques in finance could be a promising future research direction.

Sustainable Finance and ESG Integration: As the importance of environmental, social, and governance (ESG) factors in finance continues to grow, there is a need for research on developing AI-based techniques for ESG data analysis, ESG scoring and rating systems, and integrating ESG considerations into investment decisions and risk management processes.

Collaborative and Interdisciplinary Research: Given the complex and multifaceted nature of fintech and AI in finance, there is a need for increased collaboration and interdisciplinary research involving experts from various domains, including computer science, finance, economics, law, and ethics. Fostering such collaborations could lead to more holistic solutions and address the technical, regulatory, and societal challenges in this field.

These are just a few potential future research directions and open challenges in the field of fintech and AI in finance. As technology continues to evolve and new financial products and services emerge, there will be a constant need for innovative research to address emerging challenges and opportunities.

8.Financial Overview: Resource Allocation and Impact

For the second grant period spanning November 2021 to May 2022, COST Action CA19130 was allocated a total budget of EUR 270,315.26. This funding enabled the Action to undertake various activities crucial to achieving its objectives, including meetings, training schools, mobility

8.1 Summary of Budget Allocation

For the second grant period from November 2021 to May 2022, COST Action CA19130 was allocated a total budget of EUR 202,607.00. The budget was distributed across various networking tools and activities, including meetings, short-term scientific missions (STSMs), ITC conference grants, dissemination and communication products, and administrative and coordination costs.

8.2 Detailed Breakdown of Expenditures

Meetings: The largest portion of the budget, EUR 123,906.66, was allocated to organizing 10 hybrid meetings, which facilitated collaboration among researchers, policymakers, and industry leaders across Europe. These meetings included workshops, conferences, working group meetings, and core group meetings. The expenditures for meetings covered travel costs for participants, local organizer support, and logistics. Some notable meetings and their associated costs were:

- "ML approaches Finance and Management" in Berlin, Germany (EUR 3,927.98)
- "WG1 meeting" in Rennes, France (EUR 3,456.92)
- "Technology, Innovation and Stability: New Directions in Finance (TINFIN)" in Zagreb, Croatia (EUR 8,234.16)
- "COST FinAI Diversity research workshop" in Naples, Italy (EUR 13,047.60)
- "COST FinAI - The 5th International conference on economics and social sciences" in Bucharest, Romania (EUR 10,170.00)
- "COST FinAI Transparency in Finance - Core group and WG3 meeting" in Espoo, Finland (EUR 10,920.00)

- "COST FinAI Research Workshop on Transparency in Financial Markets, Core group and WG2 meeting" in Enschede, Netherlands (EUR 13,390.00)
- "Women in Fintech and Artificial Intelligence" in Tirana, Albania (EUR 10,550.00)
- "COST FinAI Conference on Transparency" in Zurich, Switzerland (EUR 1,250.00)
- "COST FinAI Transparency in Finance" in Utrecht, Netherlands (EUR 48,960.00)

Short-Term Scientific Missions (STSMs) and ITC Conference Grants a total budget of EUR 39,680.00 was allocated for 16 STSMs, with an amount of EUR 2,480.00 per STSM. The same budget of EUR 39,680.00 was allocated for 16 ITC conference grants, also with an amount of EUR 2,480.00 per grant. These grants supported collaboration, knowledge exchange, and dissemination of research findings across institutions and at external conferences.

Dissemination and Communication Products: an amount of EUR 5,093.34 was allocated for the development and maintenance of the Action's website, which served as a central hub for sharing research outputs, event updates, and resources.

Financial and Scientific Administration and Coordination (FSAC)the budget included EUR 26,427.00 for administrative and coordination activities, representing up to 15% of the total grant amount.

8.3 Financial Efficiency and Value Generation

The financial management of COST Action CA19130 during the second grant period demonstrated efficient resource allocation and generated significant value across various activities. The strategic use of hybrid formats for meetings and the support for early-career researchers through mobility grants facilitated knowledge exchange and collaboration, contributing to the development of a robust research network. The dissemination budget ensured effective communication of key findings, enhancing the visibility and impact of the Action's research. Overall, the Action effectively utilized its financial resources to achieve strategic goals, build capacity, and promote transparency in financial technologies and AI across Europe.

The COST Action CA19130 "Fintech and AI in Finance" has made substantial strides in advancing research, education, and practical applications at the intersection of financial technology and artificial intelligence. Guided by the Memorandum of Understanding (MoU), the Action has pursued the following key objectives:

9. Assessment of Progress Towards MoU Objectives

The COST Action CA19130 "Fintech and AI in Finance" was established with the mission of propelling research, education, and real-world applications at the convergence of financial technology and artificial intelligence. This ambitious undertaking was grounded in a Memorandum of Understanding (MoU) that outlined specific objectives to steer the Action's initiatives. Significant milestones have been reached in the pursuit of these objectives, marking notable advancements in the field:

Objective 1: Developing blended approaches to evaluate fintech services

The Action has made significant strides in this objective by forging strategic partnerships with leading companies like iFactor and ING. Through these collaborations, the focus has been on developing AI tools for financial risk assessment and early warning systems. Additionally, the Action has initiated cutting-edge research projects, including one funded by the Swiss National Science Foundation on anomaly and fraud detection in blockchain networks, and another with a Swiss fintech company aimed at improving loan default rating models. Leveraging its diverse network spanning 49 countries, the Action has facilitated coordinated knowledge development in this domain.

Objective 2: Enhancing transparency and explainability of AI models

Enhancing the transparency and explainability of AI models has emerged as a major research focus for the Action. This has culminated in numerous publications, proposals, and the development of explainable AI tools. To disseminate these findings, the Action has organized conferences and created dedicated platforms like ExplainableAIForFinance.com. Furthermore, the Action has contributed to the development of new interpretability measures for clustering, classification, and regression models across various data types. These advancements have been applied to practical use cases, such as understanding early lapses in insurance contracts using interpretability algorithms.

Objective 3: Seeking regulator/practitioner input on AI transparency

In pursuit of this objective, the Action has actively engaged with regulators and industry practitioners through events and collaborations. While specific details on the validation process for AI transparency are not provided, the Action estimates a progress level of 51-75% towards this objective. Continued efforts are underway to seek input from these stakeholders and validate the transparency of AI applications in the financial sector.

The milestones achieved by the Action demonstrate substantive research outputs, partnership-driven tool development, knowledge dissemination efforts, and cross-sector engagement – all geared towards the overarching fintech and AI objectives. The achievements span theoretical innovations to applied use-cases, underscoring the Action's comprehensive approach to advancing this critical domain.

Developing Blended Approaches for Fintech Evaluation

The Action has actively developed methodologies that integrate machine learning techniques to assess innovative financial services providers, with a focus on predicting operational risks like fraud and money laundering. Strategic collaborations with industry leaders such as iFactor and ING have facilitated the advancement of AI tools for financial risk assessment and early warning systems. Additionally, research projects on anomaly detection in blockchain networks and loan default rating models have been undertaken, demonstrating progress estimated at 76-100% towards this objective.

Enhancing Transparency in AI Applications

Recognizing the importance of interpretability and explainability in high-stakes financial AI models, the Action has prioritized the development of conceptual and methodological tools to replace opaque "black-box" models with transparent alternatives. This work has involved close cooperation with industry partners like ING Group to enhance their early warning credit systems, underscoring the real-world impact of the Action's efforts. Progress in this area is also estimated at 76-100%.

Engaging Regulators and Practitioners

The Action has actively sought input from regulators and practitioners' communities to validate the transparency of AI applications in finance. While specific details on the validation process are not provided, the Action has organized events and collaborations to facilitate this engagement, with progress estimated at 51-75%.

The Action's three Working Groups have made notable contributions in their respective focus areas:

WG1 (Transparency in FinTech) has developed risk analysis and rating tools for financial services using machine learning methods.

WG2 (Explainable AI and Decision-Support Models) has established frameworks for assessing the appropriateness of black-box models and enhancing their transparency or replacing them with interpretable alternatives.

WG3 (Transparency in Investment Product Performance) has aimed to improve the evaluation models of investment products by reducing false discovery rates in financial research.

Overall, the COST Action CA19130 has made significant progress towards its objectives, contributing to the development of a more transparent, accountable, and efficient financial ecosystem in Europe and beyond.

10. Identification of Key Areas for Improvement and Strategic Focus for COST Action CA19130

While the COST Action CA19130 has achieved significant milestones, several areas require continued attention to fully realize the objectives set out in the MoU:

Timely Delivery of Pending Deliverables a significant number of deliverables across all Working Groups remain unfinished. Prioritizing the completion of these outputs, including discussion papers, methodologies, databases, and the software package, is crucial to demonstrate the Action's effectiveness. This requires clear timelines, resource allocation, and potentially, revisiting the scope of some deliverables if necessary.

Enhancing Industry Collaboration: While the Action has engaged with regulators and practitioners, there is an opportunity to further strengthen collaboration with industry partners. This could involve securing additional strategic partnerships, organizing joint events, and seeking more direct input on the practical applications of the research outcomes.

Dissemination and Knowledge Transfer: The Action should prioritize disseminating its findings and research outputs to a wider audience, including the general public, policymakers, and industry stakeholders. This could involve publishing more articles, creating user-friendly online resources, and leveraging various communication channels to increase visibility and impact.

Operationalizing Research Outcomes: In addition to theoretical advancements, the Action should focus on operationalizing its research outcomes, such as developing functional prototypes, proof-of-concepts, or pilot projects in collaboration with industry partners. This hands-on approach could accelerate the adoption of the Action's findings and demonstrate their real-world applicability.

Fostering Interdisciplinary Collaboration: Given the multifaceted nature of the fintech and AI domain, the Action should continue to encourage interdisciplinary collaboration among researchers, practitioners, and experts from diverse fields. This cross-pollination of ideas and expertise could yield innovative solutions and holistic approaches to complex challenges.

Exploring Emerging Trends and Technologies: As the fintech and AI landscape rapidly evolves, the Action should remain agile and proactively explore emerging trends, technologies, and use cases. This could involve organizing dedicated workshops, inviting guest speakers, or establishing focused sub-groups to stay ahead of the curve.

By addressing these areas for improvement and strategic focus, the COST Action CA19130 can maximize its impact, ensure the practical relevance of its research outcomes, and contribute significantly to advancing the fintech and AI domains within the financial industry across Europe.

COST Action CA19130, titled “Fintech and Artificial Intelligence in Finance - Towards a Transparent Financial Industry,” has indeed been active in forming strategic partnerships and collaborative efforts during the second grant period (2021-2022). Here are some key highlights:

Key Partnerships Established

During the period of 2021-2022, COST Action CA19130 continued to build and strengthen strategic partnerships and collaborations in order to achieve its objectives. These efforts were essential to accelerate research progress, facilitate knowledge sharing, and ensure the relevance of the Action's work to current industry and regulatory needs.

The Action continued to bridge the gap between academia and industry, promoting interdisciplinary research across Europe. Partnerships with prestigious universities such as the University of Zurich, the University of Edinburgh, and the Technical University of Munich facilitated joint research initiatives focused on the intersection of Artificial Intelligence (AI), finance, and transparency. These collaborations also contributed to the formation of a dynamic research community, involving early-career researchers and top experts.

Collaborations with financial institutions and fintech companies such as Deutsche Bank and N26 were crucial for applying research findings to real-world scenarios. These partnerships enabled the testing of AI models under practical conditions, improving their robustness and applicability. Furthermore, partnerships with technology and data science companies provided access to advanced computational tools and expertise, fostering the development of innovative solutions for financial transparency and AI explainability.

Partnerships with public institutions and regulatory bodies, such as the European Central Bank (ECB) and the European Banking Authority (EBA), were vital for aligning the Action's research with policy developments related to AI and digital finance. Events such as "COST FinAI meets Brussels" facilitated direct dialogue, contributing to shaping future regulatory frameworks that promote transparency and accountability in AI-driven financial systems.

These collaborations led to various joint research initiatives, including:

- Transparency in FinTech: Research focused on improving transparency in AI-supported processes within the fintech space.
- Decision-Support Models: Studies on transparent versus black-box decision-support models in the financial industry.
- Investment Product Performance: Initiatives aimed at increasing transparency regarding investment product performance for clients.

The partnerships and collaborative efforts established during this period had far-reaching impacts. Academically, these collaborations led to significant progress in understanding and improving transparency in fintech and AI applications. At the policy level, the partnerships influenced the regulatory process, ensuring that regulatory frameworks kept pace with technological developments. Moreover, the joint efforts contributed to more transparent and accountable industry practices, benefiting both providers and consumers of financial services.

11. Conclusions and Next Steps

11.1 Reflections on Key Events and Their Impact

During the COST Action CA19130, several marquee events played a pivotal role in advancing research, building collaborations, and influencing policy related to transparency in FinTech and AI. Three flagship events merit highlighting:

COST FinAI Meets Brussels: This series of workshops brought together researchers, regulators like the European Commission and European Central Bank, and industry leaders. The dialogues facilitated cross-pollination of ideas and translated cutting-edge research into actionable insights for governance frameworks and ethical AI adoption in finance.

Women in FinTech and AI: This annual event promoted diversity, inclusivity and highlighted the contributions of women researchers and professionals. It provided a platform to address gender gaps, mentorship, and career development, thereby strengthening the talent pipeline in this critical domain.

Thematic Workshops: Focused events like the XAI in Finance Workshop enabled deeper technical discussions on core challenges such as interpretability and explainability of AI models for financial applications. Outcomes synthesized latest methods, tools and real-world use cases.

The diverse perspectives from these events directly fed into the Action's research priorities, capacity building initiatives like training schools, and regulatory guidance. Interdisciplinary collaboration and exchange of ideas catalyzed innovation.

11.2 Sustaining Momentum and Deepening Impact

As the COST Action CA19130 officially concludes, it is crucial to sustain the significant momentum and progress made over the past several years. Potential next steps to build on the achievements of this initiative include:

1. Forming new collaborative research consortia that bring together the vast network of stakeholders across academia, industry, and public institutions. This can facilitate continuity in tackling emerging topics at the intersection of finance, data science, and AI governance through public-private partnerships.

2. Evolving and enhancing digital knowledge platforms like Quantlet and Quantinar that served as hubs for sharing research findings. Maintaining these platforms will ensure the valuable outputs remain discoverable and accessible globally to the broader FinTech and AI ecosystems.

3. Shaping governance frameworks by continuing to participate in regulatory development processes and public consultations. Researchers can lend technical expertise while industry voices provide pragmatic considerations for implementation.

4. Crafting a comprehensive, interdisciplinary research agenda co-created by stakeholders spanning finance, computer science, ethics, policymaking, and other relevant disciplines. This cross-cutting roadmap can help shape funding priorities to ensure research remains contextually relevant.

5. Driving human-centered AI innovation by focusing on key values like transparency, fairness, and accountability as AI capabilities continue rapidly evolving. The Action's networks are well-positioned to spearhead research in areas such as explainable AI, ethical AI, and stakeholder empowerment.

While the COST Action culminates, the collaborations forged, knowledge assets generated, and policy implications catalyzed through this program must be actively nurtured and amplified through strategic long-term initiatives to ensure lasting global impact.