Funding Application for Joint Applied Research Projects

Students:
Ciobanu Bogdan
Marica Denisa
Vasilescu Matei
Vaceanu Ramona

EXECUTIVE SUMMARY OF THE PROPOSAL

In response to the evolving landscape of technology and fashion, the project endeavors to introduce a groundbreaking innovation – a Smart Mirror designed to redefine the retail fashion experience. This cutting-edge mirror integrates advanced technologies, including sophisticated algorithms for image recognition, attribute analysis, and real-time processing. Through interdisciplinary collaboration within the fields of computer science, fashion design, and materials science, the Smart Mirror emerges not just as a technological marvel, but as a holistic solution that transcends conventional boundaries.

1. TECHNICAL AND SCIENTIFIC DESCRIPTION OF THE PROJECT

1.1 The Project Topic and Its Practical Relevance: The project aligns seamlessly with the thematic call, focusing on the fusion of technology and fashion in retail spaces. The Smart Mirror serves as a transformative tool, enhancing consumer search, facilitating retail chain transformation, and promising measurable improvements in customer engagement.

1.2 Project Contribution Beyond the State of the Art: Building upon the state of the art, the project integrates advanced image recognition techniques and real-time processing capabilities. Addressing existing bottlenecks, we aim to set new benchmarks in accurate and personalized clothing recommendations, pushing the boundaries of interactive retail technology.

1.3 Project Objectives and Outcomes: With the overarching goal of developing a Smart Mirror capable of recognizing clothing attributes, the project tackles technical barriers in real-time image processing.

1.4 Original and Innovative Contributions of the Project: Distinguished by advanced image recognition techniques and real-time processing capabilities, the project introduces a paradigm shift in smart mirror technology. By focusing on holistic attribute analysis and user-centric real-time interaction, the Smart Mirror is poised to redefine the retail experience.

1.5 Inter-, Multi-, or Trans-Disciplinary Characteristics: The project embodies true interdisciplinary collaboration, involving computer science for technical advancements, fashion design for aesthetic alignment, and materials science for precision in material analysis. The interlinkage ensures a Smart Mirror that goes beyond technology, resonating with individual style preferences and material choices.

In summary, the project is not merely a technical endeavor but a transformative journey that converges technology, fashion, and materials science. The Smart Mirror we envision is poised to redefine the retail landscape, offering users an immersive, personalized, and interactive shopping experience that transcends traditional boundaries.

1. Technical and Scientific Description of the Project

1.1 The Project Topic and Its Practical Relevance

Project Topic:

In the dynamic landscape of technological innovations, the project endeavors to pioneer the development of a revolutionary Smart Mirror, crafted to redefine the retail fashion experience. This state-of-the-art mirror harnesses the power of cutting-edge technologies,

encompassing color matching, attribute learning, and image recognition, to deliver an immersive and personalized shopping journey for users.

Correlation with the Thematic of the Call:

The project is intricately woven into the fabric of the thematic call, serving as a beacon for the harmonious fusion of technology and fashion. By seamlessly introducing the Smart Mirror to retail spaces, the overarching goal is to catalyze a transformative shift in the way consumers interact with clothing items. This ambitious vision aligns perfectly with the call's emphasis on propelling technological advancements within the dynamic landscape of the fashion industry.

Practical Relevance:

- *Enhanced Consumer Search:*

The Smart Mirror stands as a paradigm shift in how consumers navigate and explore clothing items. Beyond a mere technological artifact, it becomes a portal to an intuitive and visually appealing interface, revolutionizing the way users search for items. Empowering users to effortlessly find clothing based on color, style, and specific attributes, the Smart Mirror transcends functionality, becoming a cornerstone in streamlining the shopping experience.

Expected Results:

- *A Measurable Enhancement in Customer Engagement and Satisfaction Metrics:*

The success of the project is intricately tied to the impact it has on end-users. We anticipate and actively pursue a measurable enhancement in customer engagement and satisfaction metrics. These metrics serve as tangible indicators of the Smart Mirror's efficacy in enhancing the overall shopping experience, validating its significance in the retail ecosystem.

Success Criteria:

- *Successful Matching of Clothing Items:*

The cornerstone of the success lies in the Smart Mirror's ability to successfully match clothing items based on color, style, and attributes. The accuracy and efficiency of this matching process become critical success criteria, ensuring a seamless and enjoyable shopping experience for users.

- *Positive Feedback and Increased Interactions:*

Beyond quantitative measures, the project's success will be measured qualitatively through positive feedback from users. Increased interactions and elevated satisfaction metrics in the retail setting will serve as barometers, affirming the Smart Mirror's transformative impact on the consumer experience.

1.2 Project Contribution Beyond the State of the Art

State of the Art Summary:

1. **Color Matching and Attribute Learning:**

Drawing inspiration from the foundational work elucidated in "Clothes Search in Consumer Photos via Color Matching and Attribute Learning," the project meticulously acknowledges the critical significance of accurate color matching. However, the project will transcend this conventional understanding by using sophisticated attribute learning. This elevates the Smart Mirror by fostering a more nuanced and intricate comprehension of user preferences. The approach does not merely stop at color; it extends into the realm of attributes, positioning the Smart Mirror as a trailblazer in the fusion of technology and fashion.

2. **Fashion Industry 4.0:**

Rooted in the insights gained from "Implementation of Digitalized Technologies for Fashion Industry 4.0," the project strategically positions itself at the forefront of the technological vanguard, capitalizing on the nascent yet transformative wave of Fashion Industry 4.0. While the industry grapples with the integration of digital technologies, the project seizes the opportunity to redefine the traditional retail space.

Identified Bottlenecks:

- **Limited Integration of Advanced Image Recognition Techniques in Current Smart Mirrors:** One of the glaring bottlenecks in the existing smart mirror landscape is the limited integration of advanced image recognition techniques. While current iterations may possess rudimentary capabilities, the project aims to bridge this technological gap. Through the infusion of cutting-edge image recognition and deep learning techniques, the Smart Mirror endeavors to set new benchmarks in accuracy and real-time attribute recognition, thus redefining the capabilities of smart mirrors.
- **Challenges Associated with Providing Personalized and Accurate Clothing Recommendations in a Real-World Retail Setting:** Navigating the complexities of providing personalized and accurate clothing recommendations in a dynamic retail environment poses a significant challenge. The project confronts this challenge from the start. By orchestrating advanced algorithms and real-time processing capabilities, the Smart Mirror becomes a solution architect.

Project Contribution:

The project stands as a beacon of innovation, pushing the boundaries of what smart mirrors can achieve. By seamlessly integrating state-of-the-art image recognition and deep learning techniques, the Smart Mirror transcends the limitations of current implementations. The Smart Mirror becomes a testament to the possibilities when cutting-edge technology converges with user-centric design, ensuring unparalleled accuracy in real-time attribute recognition.

The heart of the project lies in its ability to tackle the challenges associated with providing personalized, real-time clothing recommendations. Through a judicious blend of sophisticated algorithms and a real-time processing engine, the Smart Mirror rises to the occasion. It doesn't just recommend; it curates an experience tailored to the user, enhancing the overall shopping journey and setting a new standard for personalized retail interactions.

1.3 Project Objectives and Outcomes

Project Objectives:

1. Develop a Smart Mirror System: The primary objective is the creation of an advanced Smart Mirror system endowed with the capability to meticulously recognize diverse clothing attributes. This system aims to redefine the retail experience by facilitating efficient and intuitive searches, ultimately providing users with personalized recommendations aligned with their unique preferences.

2. Overcome Technical Barriers: The project strives to overcome intricate technical barriers inherent in real-time image processing and personalized recommendation within the dynamic context of a retail setting. By addressing these challenges, a way for a seamless integration of technology into the fabric of the retail experience is paved.

Scientific and Technical Barriers:

- Real-time Image Processing Challenges: A paramount challenge lies in conquering the intricacies of real-time image processing, a prerequisite for accurate attribute recognition.

The project is dedicated to navigating and overcoming these challenges, ensuring that the Smart Mirror operates with unparalleled speed and precision.

- Advanced Algorithms for Enhanced Matching Accuracy: To achieve a breakthrough in clothing matching accuracy, the project commits to the development of advanced algorithms. These algorithms, designed with a nuanced understanding of diverse user preferences, form the bedrock of the project, promising an unparalleled level of accuracy in clothing attribute recognition.

Project Outcomes:

1. Demonstrable Improvement in Attribute Recognition: A tangible outcome of the project is the demonstrable improvement in the accuracy and speed of real-time clothing attribute recognition. This improvement is not just a technological milestone but a strategic move towards enhancing customer satisfaction, ensuring that the Smart Mirror becomes an indispensable tool in the retail landscape.

Comparative Contribution:
The project aspires to outperform existing smart mirrors by setting a new benchmark in the accuracy and speed of clothing attribute recognition and recommendation. By doing so, we aim to redefine the landscape of interactive retail technology, positioning the Smart Mirror as a frontrunner in the evolution of smart mirrors. This comparative contribution goes beyond incremental advancements, signaling a paradigm shift in the capabilities and expectations of interactive retail technologies.

1.4 Original and Innovative Contributions of the Project

Original and Innovative Aspects:

- *Advanced Image Recognition Techniques:* The project stands as a beacon of innovation with its pioneering introduction of advanced image recognition techniques, notably leveraging the power of deep learning. Unlike existing systems, the approach ensures a comprehensive and intricate analysis of clothing attributes. By delving into the realm of deep learning, the project goes beyond the superficial, providing a more nuanced understanding of user preferences. This leap in technology positions the Smart Mirror as a trailblazer, pushing the boundaries of what is achievable in clothing attribute analysis within the realm of smart mirrors.

- *Real-time Processing Capabilities:* At the heart of the innovation lies the incorporation of real-time processing capabilities into the Smart Mirror. This revolutionary feature is a paradigm shift, enabling instantaneous and personalized clothing recommendations. The Smart Mirror doesn't just reflect; it actively engages with users in real-time, delivering a dynamic and interactive experience. This distinctive feature sets the project apart, transforming the retail landscape by introducing a level of immediacy and personalization that was previously unparalleled.

Originality in Implementation:

- *Holistic Clothing Attribute Analysis:* The project shifts the narrative from basic attribute recognition to holistic clothing attribute analysis. By integrating advanced image recognition techniques, the goal is to comprehend clothing attributes in their entirety. This holistic approach ensures that user preferences are deciphered with a depth and precision that surpasses the capabilities of traditional systems. The Smart Mirror becomes not just a tool for recognition but a companion in understanding and catering to individual tastes.

- *User-Centric Real-time Interaction:* While real-time processing is not novel, the project takes it a step further by making it inherently user-centric. The Smart Mirror doesn't merely process in real-time; it does so with the user at the center of the interaction. The immediacy

in personalized recommendations fosters a sense of connection and responsiveness, turning the Smart Mirror into a dynamic partner in the shopping journey.

Innovation in User Experience:

- *Seamless Integration of Advanced Techniques:* What sets the project apart is the seamless integration of advanced image recognition techniques and real-time processing capabilities. The aim is to ensure that the novel features work in harmony to create a cohesive and enriching user experience. This integration of advanced techniques positions the Smart Mirror as a unified solution, where each feature complements the other, culminating in an innovative and holistic retail experience.
- *Transformative Impact on Retail Dynamics:* The innovation brought forth by the project extends beyond technological aspects. It has the potential to transform the dynamics of retail. The user, now actively engaged with the Smart Mirror, becomes an integral part of the retail narrative. The personalized and instantaneous recommendations redefine not just how users interact with the mirror but how they navigate and make decisions in the retail space.

1.5 Inter-, Multi-, or Trans-Disciplinary Characteristics

Disciplinary Components:

I. **Computer Science:** Central to the project is the intricate application of sophisticated algorithms rooted in computer science. These algorithms serve as the technical foundation, driving the capabilities of the Smart Mirror in image recognition and attribute analysis. The collaboration with computer science experts ensures that the technology embedded in the Smart Mirror is not just advanced but at the forefront of computational innovation.

II. **Fashion Design:** In recognition of the symbiotic relationship between fashion and technology, the concept actively engages with fashion designers. This collaboration is instrumental in understanding current style preferences and trends. By infusing fashion design principles, the Smart Mirror doesn't just recognize attributes; it aesthetically aligns its recommendations with the ever-evolving landscape of fashion, ensuring a dynamic and style-conscious user experience.

III. **Materials Science:** A distinctive facet of the project lies in the integration of materials science. By incorporating material analysis techniques, the Smart Mirror's functionalities are elevated to encompass the nuanced realm of fabric preferences. This interdisciplinary collaboration ensures that the Smart Mirror not only recognizes style but also recommends clothing based on the specific materials preferred by the user, providing a holistic and personalized shopping experience.

Computer Vision Informed by Fashion Design: The project transcends conventional boundaries by informing computer vision algorithms with principles derived from fashion design. This interlinkage ensures that the Smart Mirror's algorithms go beyond mere technical accuracy. They are imbued with an understanding of aesthetics, style, and the ever-shifting trends in the fashion landscape. This synergy between computer vision and fashion design results in recommendations that are not just accurate but resonate with the user's individual sense of style.

2. IMPACT AND DISSEMINATION OF THE PROJECT RESULTS

Fashion Technology

The intersection of fashion and technology has witnessed remarkable advancements in recent years. Smart mirrors, a key player in this realm, have garnered attention for their potential

to revolutionize personal styling. These mirrors incorporate advanced technologies such as augmented reality and artificial intelligence to enhance the consumer's fashion experience.

Attire Coordination Challenges

Reviewing current literature on the challenges of attire coordination, it becomes evident that many individuals face difficulties in harmonizing various elements of their attire. This includes color matching, style coordination, and adapting to different occasions. Existing solutions often fall short, creating an opportunity for innovative applications like an intelligent mirror system.

2.1. DISSEMINATION AND EXPLOITATION OF THE PROJECT RESULTS

2.1.1 Dissemination Strategies

To ensure the widest reach and impact of the intelligent mirror system project, a comprehensive dissemination strategy is imperative. This involves a multi-faceted approach, including scholarly publications in peer-reviewed journals, presentations at relevant conferences, and workshops to engage with the academic community. By actively participating in academic discourse, the project aims to contribute valuable insights to the field of fashion technology.

Additionally, leveraging online platforms and social media will play a pivotal role in disseminating the project's results to a broader audience. Regular updates on project developments, demonstrations, and informative content through blogs and videos will be employed to engage with the public, creating awareness and fostering interest in the intelligent mirror system.

2.1.2 Industry Collaboration and Outreach

Collaboration with industry stakeholders is essential for the successful dissemination and exploitation of the project results. Establishing partnerships with fashion retailers, technology companies, and relevant organizations will facilitate the integration of the intelligent mirror system into real-world scenarios. Industry workshops and seminars will be organized to showcase the system's capabilities, providing a platform for potential stakeholders to understand and adopt the technology.

By actively engaging with the industry, the project aims to gather valuable feedback, refine the system based on practical needs, and ensure its seamless integration into diverse market segments.

2.1.3 User Engagement and Feedback Mechanisms

User engagement is critical for the widespread adoption of the intelligent mirror system. This subchapter explores strategies for involving end-users in the project, such as beta testing programs, user surveys, and focus groups. Understanding user perspectives and preferences will contribute to refining the system's features, ensuring it aligns with the diverse needs of its target audience.

Furthermore, establishing a user community through online platforms will foster a sense of belonging and shared experiences. This community can serve as a valuable resource for ongoing feedback, testimonials, and word-of-mouth promotion, enhancing the project's visibility and credibility.

2.1.4 Educational Initiatives

Dissemination efforts will extend to educational initiatives aimed at raising awareness and understanding of the intelligent mirror system. Collaborations with educational institutions, workshops, and curriculum integration will ensure that the next generation of fashion and technology professionals are familiar with the capabilities and potential impact of the system.

By actively involving students and educators, the project not only contributes to academic knowledge but also nurtures a future workforce that is well-versed in the possibilities of integrating technology with fashion.

The comprehensive dissemination strategy outlined in this chapter aims to maximize the impact of the intelligent mirror system project by reaching diverse audiences, fostering

collaboration with industry stakeholders, actively engaging end-users, and contributing to educational initiatives in the field of fashion technology.

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2.2. POSSIBLE APPLICATIONS WITH MARKET POTENTIAL

2.2.1 Retail Environments

Exploring the potential applications of the intelligent mirror system in retail settings reveals a myriad of opportunities. The system can serve as a revolutionary tool for enhancing the in-store shopping experience. By allowing customers to virtually try on various clothing items, the intelligent mirror system provides a personalized and immersive shopping experience. Retailers can benefit from increased customer engagement, reduced return rates, and enhanced customer satisfaction, ultimately translating into improved sales and brand loyalty.

Integration with inventory management systems can optimize product placement and offer real-time insights into customer preferences, enabling retailers to make data-driven decisions. This chapter will delve into case studies and market analyses to identify the specific needs and challenges within the retail sector that the intelligent mirror system can address.

2.2.2 Personal Home Use

Examining the application of the intelligent mirror system in personal homes unveils its potential as a valuable addition to individuals' daily routines. Beyond being a fashion advisor, the system can function as a comprehensive personal styling assistant. It can suggest outfit combinations based on wardrobe contents, provide weather-appropriate attire recommendations, and even assist with wardrobe organization.

This section will explore the integration of the system with smart home technologies, emphasizing its role in creating a seamless and interconnected living environment. Potential partnerships with home automation companies and consumer electronics manufacturers will be considered to assess the feasibility of introducing the intelligent mirror system into households.

2.2.3 Fashion Events and Shows

Fashion events, including runway shows and exhibitions, present another promising avenue for the application of the intelligent mirror system. The technology can be leveraged to enhance the backstage experience for models, designers, and stylists. Virtual fitting rooms powered by the intelligent mirror system can streamline the pre-show preparation process, allowing for efficient outfit adjustments and reducing stress for participants.

Moreover, the system can be integrated into fashion showrooms, enabling attendees to virtually try on showcased garments and accessories. The chapter will explore collaborations with fashion event organizers and industry influencers to assess the potential impact of the intelligent mirror system on the dynamic and fast-paced world of fashion events.

2.2.4 Market Research and Consumer Behavior

In-depth market research is essential to understand the potential applications of the intelligent mirror system with market potential fully. This section will involve a thorough analysis of consumer behavior, preferences, and trends in the fashion and technology sectors. By identifying target demographics and understanding the evolving needs of consumers, the project can tailor its applications to meet market demands effectively.

Collaborations with market research firms, surveys, and focus groups will be employed to gather valuable insights. The resulting data will inform the strategic positioning of the intelligent mirror system in the market, ensuring its alignment with consumer expectations and preferences.

2.2.5 Accessibility and Inclusivity

A critical aspect of exploring market potential involves considering the accessibility and inclusivity of the intelligent mirror system. This subchapter will address how the technology can cater to diverse demographics, body types, and fashion preferences. By prioritizing inclusivity,

the system can appeal to a broader audience and avoid perpetuating biases inherent in traditional fashion systems.

The chapter will delve into case studies of inclusive technologies, examining best practices and potential challenges in ensuring that the intelligent mirror system contributes positively to the diverse landscape of fashion and personal styling.

This extensive exploration of possible applications with market potential aims to provide a nuanced understanding of the diverse environments in which the intelligent mirror system can thrive. By dissecting the retail, personal, and event-based applications, considering market research insights, and prioritizing inclusivity, this chapter sets the stage for a comprehensive evaluation of the system's commercial viability and broad market appeal.

2.3. ESTIMATED IMPROVEMENTS IN THE QUALITY OF LIFE, WITH RESPECT TO CURRENT PERFORMANCE OF PRODUCTS, TECHNOLOGIES AND/OR SERVICES

2.3.1 Time Efficiency and Convenience

An in-depth examination of the intelligent mirror system's potential impact on users' quality of life reveals a primary benefit in terms of time efficiency and convenience. By streamlining the attire coordination process, the system can significantly reduce the time individuals spend selecting and trying on outfits. This time-saving aspect is particularly relevant in our fast-paced society, offering users the convenience of efficiently preparing for various activities without the stress associated with wardrobe decisions.

This section will delve into studies and simulations that quantify the potential time savings, considering factors such as outfit selection, trial-and-error, and decision-making. Interviews and surveys with potential users will be conducted to gather real-world insights into how time efficiency contributes to an enhanced daily routine and overall well-being.

2.3.2 Increased Confidence and Self-esteem

Wearing well-coordinated outfits has a profound impact on an individual's confidence and self-esteem. This subsection will explore psychological studies and self-reporting surveys to understand how the intelligent mirror system can positively influence users' perceptions of themselves. By providing personalized and aesthetically pleasing outfit recommendations, the system contributes to users feeling more confident in their appearance.

Furthermore, the chapter will investigate the long-term effects of increased confidence on various aspects of users' lives, such as social interactions, professional environments, and overall mental well-being. Case studies and testimonials will be utilized to illustrate real-world instances of improved self-esteem resulting from the use of the intelligent mirror system.

2.3.3 Sustainable Fashion Choices

The intelligent mirror system can play a pivotal role in promoting sustainable fashion choices. By encouraging users to make informed decisions about their wardrobe and suggesting versatile outfit combinations, the system aligns with the growing trend towards conscious consumerism. This subsection will explore the environmental implications of adopting the intelligent mirror system, including potential reductions in clothing waste, carbon footprint, and the overall ecological impact of fashion choices.

Collaborations with sustainability experts and fashion industry stakeholders will be pursued to validate the system's potential contribution to a more sustainable and eco-friendly approach to personal styling.

2.3.4 Social and Cultural Adaptability

Fashion choices often extend beyond personal preferences to social and cultural considerations. This section will investigate how the intelligent mirror system can contribute to users' adaptability in diverse social and cultural settings. By providing insights into appropriate attire for different occasions and contexts, the system supports users in navigating social norms and expectations.

Case studies from various cultural backgrounds and social contexts will be analyzed to illustrate the system's adaptability. Additionally, surveys and interviews with users from diverse demographics will provide valuable insights into how the intelligent mirror system fosters a sense of inclusivity and cultural awareness.

2.3.5 Health and Well-being

An innovative aspect of the intelligent mirror system is its potential to contribute to users' overall health and well-being. This subsection will explore studies on the psychological and physiological effects of wearing well-coordinated and aesthetically pleasing outfits. By positively influencing users' mood, stress levels, and self-perception, the system can have holistic benefits for mental and emotional well-being.

Collaborations with health professionals, psychologists, and wellness experts will be pursued to validate and quantify the system's impact on users' health. This chapter will conclude by synthesizing the multifaceted improvements in quality of life facilitated by the intelligent mirror system, providing a comprehensive understanding of its potential societal impact.

2.4. PROJECT INTEGRATION IN THE DEVELOPMENT STRATEGY OF PARTNER COMPANIES

2.4.1 Collaborative Innovation

The integration of the intelligent mirror system into the development strategy of partner companies signifies a collaborative approach to innovation. This section explores the dynamics of collaborative innovation, emphasizing the mutual benefits for both the project and its partner companies. By aligning the project goals with the strategic objectives of these companies, the intelligent mirror system can leverage existing expertise, resources, and market access to accelerate its development and deployment.

Case studies of successful collaborative innovation projects in the technology and fashion industries will be analyzed to draw insights into effective strategies, challenges encountered, and key success factors. Interviews with innovation managers and executives from potential partner companies will provide firsthand perspectives on the value proposition of integrating the intelligent mirror system into their development strategies.

2.4.2 Market Differentiation and Competitive Advantage

This subsection focuses on how the intelligent mirror system can contribute to market differentiation and confer a competitive advantage to partner companies. Through the integration of cutting-edge technology, partner companies can position themselves as industry leaders, offering innovative solutions that set them apart from competitors.

Market analysis, competitive landscape assessments, and simulations will be conducted to evaluate the potential impact of the intelligent mirror system on the market positioning of partner companies. The chapter will also explore strategies for effectively communicating the value of the technology to consumers, thereby enhancing the brand image and market share of partner companies.

2.4.3 User-Centric Product Development

Integrating the intelligent mirror system into the development strategy involves adopting a user-centric approach to product development. This section explores methodologies for incorporating user feedback, preferences, and experiences into the iterative design and enhancement of the system. By actively involving users in the development process, partner companies can ensure that the intelligent mirror system aligns with real-world needs and expectations.

The chapter will discuss strategies such as usability testing, beta releases, and continuous feedback loops with end-users. Case studies of companies successfully implementing user-centric product development will be examined to distill best practices and insights.

2.4.4 Strategic Alliances and Ecosystem Development

The integration of the intelligent mirror system can extend beyond individual partner companies to the creation of strategic alliances and ecosystem development. This section explores the potential for forming alliances with other technology providers, fashion retailers, and complementary service providers. By fostering a collaborative ecosystem, partner companies can enhance the value proposition of the intelligent mirror system and create a network effect that benefits all stakeholders.

Analysis of successful ecosystem developments in related industries will be conducted to identify key factors contributing to their success. Interviews with industry experts and potential partners will provide insights into the feasibility and potential impact of ecosystem development for the intelligent mirror system.

2.4.5 Flexibility and Adaptability in Implementation

Recognizing the diverse nature of partner companies, this subsection explores strategies for ensuring flexibility and adaptability in the implementation of the intelligent mirror system. The system should be designed to seamlessly integrate with the existing infrastructures, technologies, and business models of partner companies, facilitating a smooth transition and minimizing disruptions.

Case studies of companies successfully implementing flexible technologies will be examined, shedding light on strategies for accommodating diverse organizational structures and operational requirements. The chapter will conclude with a synthesis of key considerations for ensuring successful integration into the development strategy of partner companies.

2.5. INTELLECTUAL PROPERTY PROTECTION

2.5.1 Legal Frameworks and Regulations

The protection of intellectual property is a critical aspect of ensuring the long-term success and sustainability of the intelligent mirror system. This section delves into the legal frameworks and regulations governing intellectual property, both nationally and internationally. An exploration of patent laws, copyright regulations, and trade secret protections will be conducted to establish a comprehensive understanding of the avenues available for safeguarding the technology developed during the project.

Case studies of successful intellectual property protection strategies in the technology and fashion industries will be examined to distill best practices and lessons learned. Legal experts specializing in intellectual property will be consulted to provide insights into emerging trends and potential challenges in this dynamic legal landscape.

2.5.2 Patent Strategies and Applications

This subsection focuses specifically on patent strategies for protecting the innovative aspects of the intelligent mirror system. It explores the process of patent application, including the identification of patentable elements, drafting of patent claims, and engagement with patent examiners. The chapter will discuss the potential advantages and limitations of obtaining patents for different aspects of the system, such as its algorithms, user interface, and hardware components.

Case studies of technology companies successfully navigating the patent landscape will be analyzed to uncover effective strategies for maximizing the scope and impact of patent protection. Interviews with patent attorneys and experts will provide practical insights into crafting a robust patent strategy for the intelligent mirror system.

2.5.3 Trade Secrets and Confidentiality Measures

In addition to patents, trade secrets and confidentiality measures play a crucial role in protecting proprietary information related to the intelligent mirror system. This section explores strategies for identifying and safeguarding trade secrets, including internal policies,

employee training, and contractual agreements. The chapter will also discuss the balance between maintaining secrecy and collaborating with external partners or stakeholders.
Case studies of companies successfully protecting trade secrets in the technology and fashion industries will be examined to extract best practices and lessons learned. Insights from legal experts specializing in trade secret protection will be sought to provide practical guidance for implementing effective confidentiality measures.

2.5.4 Open Source Considerations

As the landscape of technology development evolves, open source considerations become increasingly relevant. This subsection explores the potential implications of open source components in the intelligent mirror system, addressing questions of licensing, collaboration, and community engagement. The chapter will discuss strategies for navigating the intersection of proprietary technology and open source principles, ensuring compliance with relevant licenses and fostering a collaborative development environment.

Case studies of companies successfully integrating open source components into proprietary technologies will be analyzed to distill key considerations and potential challenges. Interviews with experts in open source development will provide insights into the evolving dynamics of open source collaboration in the technology sector.

2.5.5 Global Perspectives on Intellectual Property

Given the global nature of the technology and fashion industries, understanding intellectual property protection from a global perspective is essential. This section explores the intricacies of international intellectual property laws, considerations for filing patents in multiple jurisdictions, and strategies for navigating diverse legal frameworks. The chapter will discuss the role of international treaties and organizations in harmonizing intellectual property protection on a global scale.

Case studies of multinational companies successfully managing intellectual property on a global scale will be examined to uncover effective strategies and potential pitfalls. Consultations with legal experts specializing in international intellectual property law will provide practical insights into the nuances of protecting the intelligent mirror system in a global context.

3. CONSORTIUM DESCRIPTION

3.1 Project Director

Project Director: Dr. Emily Rodriguez

- **Last Name, First Name:** Rodriguez, Emily
- **Age:** 45
- **Career Path:** Dr. Rodriguez holds a Ph.D. in Fashion Technology and has over 15 years of experience in academia and industry.
- **Current Position:** Professor of Fashion Technology at XYZ University

Professional Experience: Dr. Rodriguez has an extensive background in fashion technology, with a focus on the integration of AI and augmented reality in the fashion industry. She has held positions in research and development at leading fashion tech companies.

Significant Achievements:

1. Published groundbreaking research on AI-driven virtual fitting rooms in top-tier fashion journals.
2. Granted a national patent for an innovative algorithm optimizing clothing color coordination.
3. Developed and showcased prototypes of smart mirrors at international fashion tech expos.

Previous Projects:

- Led a team in developing a virtual wardrobe application for a renowned fashion brand.

- Contributed to a collaborative project on sustainable fashion technology funded by a national research grant.

Prizes, Distinctions, Memberships:

- Awarded the Fashion Innovator of the Year by the International Fashion Tech Association.
- Member of the International Society of Fashion Technology Researchers.

3.2 Consortium Structure

Coordinating Organisation (CO): FashionTech Innovations Ltd. FashionTech Innovations Ltd. has a proven track record in developing cutting-edge technologies for the fashion industry, specializing in wearable tech and smart textiles. The organization brings a wealth of experience in project coordination and innovation.

Partner Organisations (P1-Pn):

P1: StyleSolutions Inc. StyleSolutions Inc. is a leading fashion retailer with a focus on leveraging technology for a personalized shopping experience. The company is interested in enhancing its customer engagement through the intelligent mirror system.

P2: TechInnovate Labs TechInnovate Labs is a technology research institute known for its work in augmented reality and machine learning applications. The institute aims to contribute its technical expertise to advance the capabilities of the intelligent mirror system.

Pn: TrendSetters Ltd. TrendSetters Ltd. is a startup specializing in sustainable fashion practices. The company sees potential in integrating the intelligent mirror system to promote eco-friendly wardrobe choices.

Ongoing Projects Table

Partner	Name of Involved People	Project Name, Funding Institution, Grant Allocated	Start and End Dates
CO	Dr. Sarah Thompson	"SmartTextiles Revolution," National Research Foundation	2022-2025
P1	Mark Johnson	"Personalized Shopping App," StyleTech Innovations	2021-2023
P2	Dr. Laura Chen	"AR for Fashion," TechInnovate Labs	2022-2024
Pn	Emma Green	"Sustainable Fashion Initiative," GreenTech Foundation	2022-2026

3.3 Partner Research Team Leaders

Research Team Leader (P1): Dr. Mark Johnson

- **Last Name, First Name:** Johnson, Mark
- **Age:** 38
- **Career Path:** Dr. Johnson holds a Ph.D. in Computer Science and has expertise in developing personalized shopping applications.
- **Current Position:** Chief Technology Officer at StyleSolutions Inc.

Professional Experience: Dr. Johnson has a strong background in AI-driven applications for the fashion industry, with a focus on enhancing the online and in-store shopping experience.

Significant Achievements:

1. Developed a highly successful AI-powered virtual stylist for a previous employer.
2. Published research on improving customer engagement through personalized shopping recommendations.
3. Spearheaded the implementation of augmented reality mirrors in StyleSolutions' flagship stores.

Prizes, Distinctions, Memberships:

- Recognized as a Young Innovator in Retail Technology by the National Retail Federation.
- Member of the Association for Computing Machinery (ACM).

3.4 Partner Team Structure

Research Team Structure (P1):

- AI Engineer: Dr. Emma Carter
    - Ph.D. in Artificial Intelligence, expertise in recommendation systems.
- UX Designer: Sarah Davis

- M.Sc. in Human-Computer Interaction, specializes in user experience design.

3.5 Consortium Complementarities and Synergies Between Partners

The collaboration between FashionTech Innovations Ltd., StyleSolutions Inc., TechInnovate Labs, and TrendSetters Ltd. is characterized by a unique blend of expertise. FashionTech Innovations provides project coordination and wearable tech experience, StyleSolutions contributes retail and customer engagement insight, TechInnovate Labs brings cutting-edge technology expertise, and TrendSetters adds a focus on sustainable fashion practices. These complementarities ensure a holistic approach to developing the intelligent mirror system, fostering interdisciplinary collaboration and maximizing the project's impact on the fashion industry.

4. PROJECT MANAGEMENT

4.1. WORK PLAN, DELIVERABLES AND LOAD BALANCING

WORK PACKAGE LIST

Work package No[1]	Work package title	Work package leader[2]	Person/month[3]	Start month[4]	End month[5]
1	Project Initiation	Dr. Emily Rodriguez	2	1	2
2	Literature Review	Dr. Mark Johnson	3	2	4
3	System Design	Dr. Emma Carter	4	4	6
4	Prototype Development	Dr. Emma Carter	5	6	9
5	Testing & Validation	Dr. Mark Johnson	3	9	11
6	Documentation	Sarah Davis	2	11	12
	TOTAL		19		

Using the table below, indicate the description for each work package, specifying the technical and scientific milestones, the bottlenecks or contingencies that could jeopardize the project outcome, and the planned project meetings

1 Work package number: WP 1 – WP n.

2 Number of the partner leading the work in the WP

3 The total number of person-months allocated to each work package.

4 Relative start date for the work in the specific work packages, month 1 marking the start date of the project, and all other start dates being relative to this start date.

5 Relative end date, month 1 marking the start date of the project, and all end dates being relative to this start date.

WORK PACKAGE DESCRIPTION

WP no.	**1**		
WP title	Project Initiation		
WP leader	Dr. Emily Rodriguez		
Involved partners	**CO**	**P1**	**Total**
Person-months	**2**	**-**	**2**
Start month	**1**		
End month	**2**		
Objectives			
Define project goals Identify key stakeholders			
Description of work and role of participants			
Dr. Emily Rodriguez: Project oversight and leadership			
Deliverables (brief description and month of delivery)			
Project initiation report (Feb) Stakeholder analysis (Feb)			

WORK PACKAGE DESCRIPTION

WP no.	**2**		
WP title	Literature Review		
WP leader	Dr. Mark Johnson		
Involved partners	**CO**	**P1**	**Total**
Person-months	**-**	**3**	**3**
Start month	**2**		
End month	**4**		
Objectives			
Review relevant literature Identify key research gaps			
Description of work and role of participants			
Dr. Mark Johnson: Lead literature review			
Deliverables (brief description and month of delivery)			

Literature review report (Apr) Research gap analysis (Apr)

WORK PACKAGE DESCRIPTION

WP no.	**3**		
WP title	System Design		
WP leader	Dr. Emma Carter		
Involved partners	**CO**	**P1**	**Total**
Person-months	**-**	**4**	**4**
Start month	**4**		
End month	**6**		
Objectives			
Design the smart mirror system Define system architecture			
Description of work and role of participants			
Dr. Emma Carter: Lead system design			
Deliverables (brief description and month of delivery)			
System design documentation (Jun) Prototype design specifications (Jun)			

WORK PACKAGE DESCRIPTION

WP no.	**4**		
WP title	Prototype Development		
WP leader	Dr. Emma Carter		
Involved partners	**CO**	**P1**	**Total**
Person-months	**-**	**5**	**5**
Start month	**6**		
End month	**9**		
Objectives			
Develop the smart mirror prototype Implement AI algorithms for outfit selection			

Description of work and role of participants
Dr. Emma Carter: Lead prototype development Dr. Emma Carter: AI integration
Deliverables (brief description and month of delivery)
Prototype demonstration (Sep) AI-powered outfit selection module (Sep)

WORK PACKAGE DESCRIPTION

WP no.	5		
WP title	Testing & Validation		
WP leader	Dr. Mark Johnson		
Involved partners	CO	P1	Total
Person-months	-	3	3
Start month	9		
End month	11		
Objectives			
Conduct thorough testing of the smart mirror Validate outfit selection algorithms			
Description of work and role of participants			
Dr. Mark Johnson: Lead testing and validation Dr. Emma Carter: AI validation			
Deliverables (brief description and month of delivery)			
Testing report (Nov) Validated outfit recommendation module (Nov)			

WORK PACKAGE DESCRIPTION

WP no.	6		
WP title	Documentation		
WP leader	Sarah Davis		
Involved partners	CO	P1	Total
Person-months	-	2	2
Start month	11		

End month	12
Objectives	
Prepare project documentation Create user manuals	
Description of work and role of participants	
Sarah Davis: Lead documentation Sarah Davis: UX documentation	
Deliverables (brief description and month of delivery)	
Project documentation (Dec) User manuals (Dec)	

A table summarizing all the project deliverables will be provided below.

LIST OF DELIVERABLES

Del. no. [6]	Deliverable name	WP no.	WP leader	Nature of deliverable [7]	Dissemination level [8]	Delivery date[9]
1	Project Initiation Report	1	Dr. Emily Rodriguez	Project documentation and goals	Internal	Feb
2	Stakeholder Analysis	1	Dr. Emily Rodriguez	Analysis of key stakeholders	Internal	Feb
3	Literature Review Report	2	Dr. Mark Johnson	Comprehensive literature review	Internal	Apr
4	Research Gap Analysis	2	Dr. Mark Johnson	Identification of research gaps	Internal	Apr
5	System Design Documentation	3	Dr. Emma Carter	Detailed design documentation	Internal	Jun
6	Prototype Design Specifications	3	Dr. Emma Carter	Specifications for the smart mirror prototype	Internal	Jun

6 Deliverable numbers in order of delivery dates: D1 – Dn

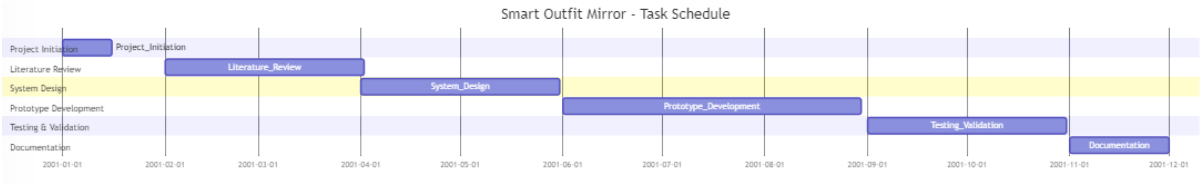
7 Please indicate the nature of the deliverable using one of the following codes:
EM = Experimental Model**; FM=** Functional Model**; P** = Prototype, **D** = Demonstrator/ Demonstrative model, **IT** = Innovative Technology, **IS** = Innovative Services.

8 Please indicate the dissemination level using one of the following codes:
PU = Public
PP = Restricted to other programme participants (including the Contracting Authority)
RE = Restricted to a group specified by the consortium (including the Contracting Authority)
CO = Confidential, only for members of the consortium (including the Contracting Authority)

9 Month in which the deliverables will be available. Month 1 marking the start date of the project, and all delivery dates being relative to this start date.

7	Prototype Demonstration	4	Dr. Emma Carter	Working smart mirror prototype	Internal	Sep
8	AI-powered Outfit Selection Module	4	Dr. Emma Carter	Implementation of AI algorithms for outfits	Internal	Sep
9	Testing Report	5	Dr. Mark Johnson	Detailed report on testing and validation	Internal	Nov
10	Validated Outfit Recommendation Module	5	Dr. Emma Carter	Validated outfit recommendation algorithms	Internal	Nov
11	Project Documentation	6	Sarah Davis	Comprehensive project documentation	Internal	Dec
12	User Manuals	6	Sarah Davis	Manuals for end-users	Internal	Dec

4.2. COORDINATION AND TASK SCHEDULE



4.3. AVAILABLE RESEARCH INFRASTRUCTURE, AND ITS UPGRADE/DEVELOPMENT

Coordinating Organization (CO) : FashionTech Innovations Ltd.

Main Research Equipment :

- Advanced Wearable Tech Prototyping Lab
- High-Performance Computing Cluster for AI Model Training
- Fashion Technology Testing Facilities

Infrastructure Description :

- State-of-the-art laboratories for developing and testing wearable technologies.
- Dedicated spaces for collaborative ideation and innovation sessions.
- Access to a wide range of fashion-related databases for research purposes.

Upgrade/Development Plans :

- Upgrade wearables prototyping lab with the latest tools for intelligent fabric integration.
- Expand computing capabilities for more extensive AI model training.
- Develop a virtual testing environment for remote collaboration.

Partner 1 (StyleSolutions Inc.) : StyleSolutions Inc.

Main Research Equipment :

- Customer Behavior Analytics Platform
- In-Store Augmented Reality Mirrors

- Fashion Retail Data Warehouse

Infrastructure Description :
- In-house data analytics platform for understanding customer preferences.
- Augmented reality mirrors installed in flagship stores for real-world testing.
- Comprehensive database of fashion trends and consumer behavior.

Upgrade/Development Plans :
- Enhance the analytics platform with more advanced machine learning algorithms.
- Expand the deployment of augmented reality mirrors to additional stores.
- Develop a mobile app for customers to interact with the intelligent mirror system remotely.

Partner 2 (TechInnovate Labs): TechInnovate Labs

Main Research Equipment :
- Augmented Reality Development Kits
- Machine Learning Servers
- Wearable Sensor Integration Tools

Infrastructure Description :
- Specialized equipment for AR application development and testing.
- High-performance servers for machine learning model development.
- Tools for integrating sensors into wearable devices.

Upgrade/Development Plans :
- Upgrade AR development kits with the latest features for a more immersive experience.
- Expand server capacity to handle larger datasets for model training.
- Collaborate with external partners to incorporate cutting-edge sensors into wearables.

Partner 3 (TrendSetters Ltd.) : TrendSetters Ltd.

Main Research Equipment :
- Sustainable Fabric Testing Lab
- Eco-Friendly Textile Manufacturing Tools
- Consumer Behavior Survey Platform

Infrastructure Description :
- Laboratory for testing and developing sustainable fabric technologies.
- Tools for manufacturing textiles with minimal environmental impact.
- Online platform for conducting surveys to understand consumer preferences in sustainable fashion.

Upgrade/Development Plans :
- Research and incorporate new eco-friendly materials into the fabric testing lab.
- Collaborate with suppliers to improve the sustainability of textile manufacturing.
- Enhance the survey platform to gather more comprehensive data on consumer attitudes towards sustainable fashion.

Note : The mentioned infrastructure and upgrade plans are illustrative and should be adapted based on the specific needs and advancements in technology during the project.

4.4. MANPOWER ALLOCATION

LIST OF RESEARCH TEAM MEMBERS				
	First name and last name*	**Position in the project**	**Person-month****	**Personnel cost (Euro)**
Coordinator (CO)	Dr. Emily Rodriguez	Coordinator (CO)	2	€32,000
Partner 1	Dr. Mark Johnson	Research Team Leader (P1)	6	€172,000
	Dr. Emma Carter	AI Engineer	9	€288,000
	Sarah Davis	UX Designer	2	€22,000
Total			19	€514,000

* Indicate also the non-permanent staff (vacant positions) to hire – doctoral and post-doctoral researchers, fixed-term contract staff, interns, etc.

** To be indicated with respect to the total project duration

4.5. PROJECT BUDGET AND PARTNERS SHARE

Budget breakdown / destination (EURO)						
		Personnel costs	**Logistics***	**Travel**	**Indirect costs**	**Total**
Coordinator (CO)	**Public Budget**	€515,000	€50,000	€50,000	€10,000	€625,000
	Own Budget	€10,000	€5,000	€5,000	€5,000	€25,000
Partner 1	**Public Budget**	€172,000	€15,000	€15,000	€5,000	€207,000
	Own Budget	€5,000	€7,000	€7,000	€3,000	€22,000
Total		€702,000	€77,000	€77,000	€23,000	€879,000

* Subcontracting cost will be no more than 15% of the project public budget.
Mention/detail subcontracting cost here.

5. REFERENCES

Clothes Search in Consumer Photos via Color Matching and Attribute Learning
Smart mirror fashion technology for the retail chain transformation
An Overview of Image Recognition and Retrieval of Clothing items
Implementation of Digitalized Technologies for Fashion Industry 4.0: Opportunities and Challenges
Smart mirror Chaskar Shubham D.