

New Product Category Innovation

Cross-Disciplinary R&D Leadership in Heating & Air-cleaning

The Challenge

Our client needed to develop an entirely novel product category from scratch: a new heating device with a heat-booster and an air-cleaning function. The mandate involved leading R&D engineering and product development while actively **de-risking technical innovation** in a highly complex b2b2c market sector.

A key hurdle was the enterprise's traditional **siloed structure**, requiring expertise from two independent business units to collaborate effectively on the R&D activities.

My Contribution

I led the innovation and R&D project from concept to prototype, introducing advanced **CFD (Computational Fluid Dynamics) simulation** into engineering and product development workflows. This structured approach streamlined the development process.

My expertise in cross-expertise R&D project management was crucial, fostering collaboration between the distinct business units and expertises. This allowed for the **timely achievement of double-expertise technology functions** and optimized product outcomes.

Key Outcomes & Impact



Accelerated R&D Cycles

Significantly reduced development timelines through integrated simulation and testing iterations and structured project management.



Data-Driven Decision Making

Established a **robust simulation-testing-results driven approach** for evaluating and refining product designs.

Introduced design engineering and materials compatible with **circular economy design**.



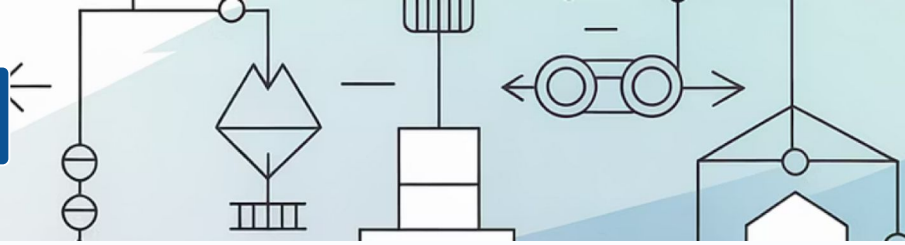
Enhanced Cross-Unit Collaboration

Successfully **integrated expertise from distinct business units**, overcoming organisational silos for optimal results. Introduction of matrix-organization project management processes.



De-risked Innovation & Performance

Systematically addressed technical challenges, ensuring the new heating device concept progressed safely and efficiently. **Aligning R&D engineering and product design objectives** to achieve a product with high technical performance and stylish design.



Sales & Operations Planning Transformation

Energy Sector Manufacturing Client

The Challenge

A national energy-sector manufacturer faced significant coordination challenges between sales, operations, and production planning functions. Siloed departments led to planning opacity, misaligned priorities, and operational inefficiencies. The lack of integrated processes resulted in inventory imbalances—excessive final product stocks coupled with component availability issues in final assembly operations.

The organisation needed a systematic approach to unify demand forecasting with production capacity, enabling proactive decision-making and resource optimization across the supply chain.

My Contribution

Designed and implemented a comprehensive S&OP process at national level, establishing cross-functional governance and standardized planning cycles. Created transparent demand forecasting mechanisms, integrated production scheduling, and real-time visibility dashboards. Facilitated stakeholder alignment workshops, established KPI frameworks, and embedded continuous improvement protocols to ensure sustained adoption.

Transformative



Planning Transparency

Established real-time visibility across all planning functions through integrated dashboards and standardised reporting protocols.



Cross-Functional Alignment

Achieved unified objectives across sales, operations, and production through collaborative monthly planning cycles and governance structures.



Operational Efficiency

Streamlined production planning processes, reducing lead times and improving resource allocation accuracy.



Inventory Optimisation

Enhanced component availability planning in final assembly, whilst strategically reducing finished goods stock levels.

"The S&OP implementation delivered immediate operational benefits whilst establishing a foundation for continuous improvement. The process created clarity across previously disconnected functions and enabled data-driven decision-making at all levels."

Vehicle Plant Crisis Management

Strategic Intervention in Automotive Quality (International)

The Challenge

A critical, end-of-line quality defect threatened to halt production at an international vehicle manufacturing plant. The issue, if left unresolved, posed immediate risks of significant financial losses from production delays, consequent need of rework of vehicles after end-of-line, potential penalties, and severe damage to the brand's reputation for quality. The situation demanded an urgent and highly coordinated response involving multiple stakeholders across the global supply chain and internal plant operations.

My Contribution

I took immediate leadership, initiating a comprehensive, structured failure analysis to rapidly diagnose the root cause of the quality anomaly. This involved meticulously coordinating efforts between internal plant teams – including production, quality assurance, and engineering – and specific R&D expertise resources as well as critical international suppliers. My focus was on fostering a collaborative environment to expedite problem-solving, leading a thorough root-cause analysis and implementing rapid, effective rework strategies to resume and maintain continuous production while addressing the underlying issues.

Key Metrics

0

Production Delay
No production line stoppage.

€4M

Cost Savings
Realised within three months due to swift resolution.

Impact & Outcomes



Production Maintained

Successfully prevented a complete stoppage of the vehicle production line, ensuring continuity of supply and avoiding significant operational disruption.



Substantial Cost Savings

Achieved a saving of €4 million within three months by mitigating losses from potential production delays, avoidance of consequent powertrain scrapping, rework, and associated penalties.



Rapid Problem Resolution

Implemented and led an efficient root cause analysis and coordinated rapid rework, enabling a swift return to normal quality standards and production output.



Enhanced Cross-Functional Alignment

Strengthened collaboration between plant teams and international suppliers, establishing a more robust framework for future quality management and crisis response.

Value Chain & Quality Processes

Optimising Operations for an Energy Sector Manufacturer

The Challenge

Our client, a prominent energy plant technology manufacturer, was challenged to significantly elevate both the efficiency and quality within their just-in-time assembly plant value chain. Operating in a highly regulated and technically demanding sector, any process inefficiencies or quality discrepancies had profound implications, ranging from substantial financial penalties to project delays and reputational damage. The existing operational framework, while functional, lacked integrated quality assurance mechanisms and suffered from process bottlenecks that impeded agility and responsiveness to evolving market demands.

My Contribution

I conducted an in-depth value chain analysis to meticulously map out end-to-end processes. This involved identifying critical bottlenecks, pinpointing areas of waste, and optimising resource allocation. A core component of my strategy was the introduction of robust **quality-gate processes** at key stages of manufacturing and assembly, alongside the implementation of **efficiency measures** to streamline the lean workflows and reduce lead times. This structured approach not only addressed immediate operational challenges but also established a framework that fit the continuous improvement of lean production.

Impact & Outcomes



Enhanced Operational Efficiency

Streamlined core manufacturing and assembly processes, leading to measurable reductions in operational waste and improved throughput.



Robust Quality Assurance

Implemented stringent quality-gate protocols, significantly reducing defects and rework, and bolstering product reliability in the field.



Empowered Decision-Making

Provided functional leaders with clearer data and insights from the enhanced value chain, facilitating more informed and timely strategic and tactical decisions.



Strengthened Organisational Robustness

Reinforced the Lean production culture of continuous improvement and proactive problem-solving, making the value chain more resilient to future challenges and market shifts.

Global Powertrain R&D Leadership

International Compliance & Innovation for Euro 0 up to Euro 6

The Challenge

A critical mandate to develop and adapt to specific vehicle families compliant diesel powertrains for worldwide markets, navigating the complexities of Euro 0 to Euro 6 regulatory frameworks. This required leading intricate R&D efforts across a global footprint, ensuring technical innovation met stringent environmental standards while achieving successful market entry.

The challenge was amplified by the need to coordinate diverse R&D, testing, and manufacturing teams spread across multiple continents, demanding exceptional **technical guidance and cross-cultural understanding**.

My Contribution

I spearheaded international R&D programs with budgets up to €8M, overseeing the entire lifecycle from development and validation to certification across six continents. My role involved bridging technical expertise across R&D powertrain engineering, testing, and manufacturing teams located on 3 continents. Crucially, I ensured clear communication, leveraged deep combustion powertrain engineering knowledge to guide cross-expertise collaboration, and fostered inter-cultural understanding to drive these complex projects to successful global market launches.

Key Metrics

€8M

Budget Managed
Managed international R&D programs.

6

Continents Certified
Oversaw certification across six continents.

3

Regions Coordinated
Spanned R&D teams across three distinct regions.

Impact & Outcomes



Global Compliance Achieved

Successfully navigated complex Euro 0 to Euro 6 regulatory landscapes to ensure powertrain compliance across diverse international markets.



Technical Excellence Driven

Drove advanced combustion powertrain engineering, delivering high-performance and environmentally compliant diesel technologies.



Cross-Cultural Collaboration Fostered

Fostered effective collaboration and communication among R&D, testing, and manufacturing teams spanning three continents.



Budgetary Oversight Ensured

Managed international R&D programs with budgets up to €8M, ensuring efficient resource allocation and timely project completion.

Early Product Development – AI & Robotics

Pioneering Emotional Intelligence for Smart Home Devices

The Challenge

In 2015, the burgeoning AI & IoT home device market was ripe for innovation beyond basic utility. My client sought to differentiate their product by embedding emotional intelligence and diverse personality profiling, aiming to create a device capable of developing intuitive and personalised interactions. This ambitious mandate required a deep dive into behavioural and cultural sciences to inform the design of an AI that could not only recognise human emotions but also respond in a manner perceived as genuinely empathetic and engaging, reflecting an understanding of diverse user needs and cultural nuances.

My Contribution

I played a pivotal role in the early product development phase, specifically focusing on the integration of emotional interaction capacities. My work involved extensive research into emotional personality recognition strategies, translating complex behavioural science insights into tangible AI design principles. This included prototyping interaction models, devising algorithms for emotional state detection, and advising on data acquisition methods to train the AI. My contribution was critical in establishing a scientific and technological framework that would enable the device to offer a truly unique and emotionally responsive user experience.

Impact & Outcomes



Advanced AI Framework

Developed a robust, foundational framework capable of processing and interpreting complex emotional and behavioural cues, a significant step towards truly intelligent interaction.



Innovation in User Experience

Pioneered a novel approach to human-AI interaction, defining a new standard for empathetic and culturally aware responses in consumer electronics.



Enabled Future Growth & Funding

The sophisticated emotional AI capabilities proved instrumental in attracting subsequent investment and facilitating the technology's scale-up for broader market adoption.



Strategic Product Direction

Provided crucial insights that shaped the product's strategic roadmap, positioning it as a leader in emotionally intelligent and user-centric IoT home devices.



Open Innovation Research & Thought Leadership

Leading a Think Tank on Collaborative Innovation

The Challenge

In 2014, corporations grappled with the paradigm shift towards open innovation, yet many struggled with practical implementation. The client mandated a think tank project to delve into the complexities of integrating external knowledge, partnerships, and crowdsourcing within traditional corporate structures. Key challenges included overcoming internal resistance to change, safeguarding intellectual property, fostering a culture of collaboration, and ensuring that external ideas could be effectively assimilated and scaled. The goal was to move beyond theoretical discussions to identify actionable insights and mitigate the inherent risks.

My Contribution

I spearheaded this pivotal initiative, leading a team of five dedicated volunteers in a comprehensive research effort. My role encompassed designing and executing a series of in-depth expert interviews with industry leaders, academics, and innovation practitioners. I directed the rigorous analysis of qualitative and quantitative data, synthesising complex findings into clear, concise, and actionable recommendations. Furthermore, I led the elaboration of the final presentation for key stakeholders and authored a detailed report for the yearly think tank publication, ensuring our findings contributed significantly to the discourse on corporate open innovation.

Key Metrics & Engagement

5	20+	2014
Volunteer Team Led Directed a dedicated team of experienced professionals.	Expert Interviews Conducted Gathered insights from a diverse range of industry leaders.	Project Year Timely completion for annual publication.

Impact & Outcomes

 Actionable Insights Delivered Provided practical, evidence-based strategies that enabled client corporations to transition from theoretical understanding to effective implementation of open innovation practices.	 Enhanced Collaboration Frameworks Developed guidelines for fostering robust internal and external partnerships, significantly reducing friction in knowledge exchange and co-creation efforts.	 Thought Leadership Established Contributed a comprehensive report and presentation that advanced the global understanding of open innovation challenges and best practices within corporate environments.
 Mitigated Implementation Risks Identified critical risks associated with open innovation and proposed effective mitigation strategies, ensuring more secure and successful project outcomes.		

Sustainable Engineering Methodology – Circular Products

Developing Circular & Repairable Product Design

The Challenge

In an era of increasing environmental awareness and stringent regulations, a prominent client in machinery and household devices sought to fundamentally shift its R&D engineering processes. The mandate was to move beyond traditional linear product lifecycles and embed circularity, repairability, and extended product lifespan into the core design philosophy. This required a re-evaluation of existing methodologies to ensure new products were not only high-performing but also designed for disassembly, material recovery, and ease of repair, posing a significant challenge to conventional engineering practices and necessitating a deep integration of various disciplines from concept to end-of-life planning.

My Contribution

I took the lead in designing and implementing comprehensive mechanical and electrical engineering methodologies tailored for circular product design. This involved developing new frameworks that seamlessly integrated principles of repairability, modularity, and resource efficiency. A key aspect of my work was fostering a collaborative environment where design, material science, and R&D engineering teams could converge their expertise. By introducing iterative design-for-circularity thinking methods, I enabled a multi-expertise based optimisation approach, ensuring that material selection, component standardisation, and end-of-life strategies were considered from the earliest stages of product development.

Impact & Outcomes



Systematic Circular Product Development

Established robust, repeatable engineering processes that enable the consistent development of products with embedded circular economy principles, significantly reducing waste and environmental impact.



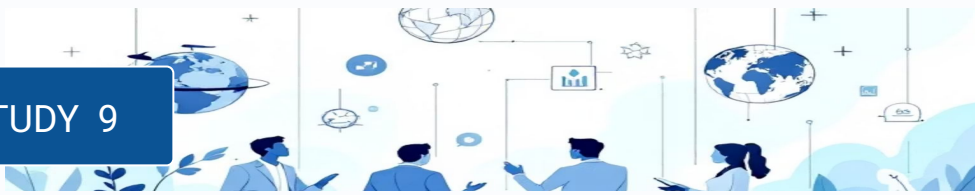
Enhanced Product Repairability & Longevity

Successfully integrated design-for-repair and modularity concepts, leading to products that are easier and more cost-effective to maintain, extending their useful life and customer value.



Thought Leadership & Recognition

Our innovative methodologies were recognised and referenced at the International Society for Professional Innovation Management (ISPIM) conferences in both 2021 and 2023, showcasing pioneering work in sustainable engineering.



Co-Creation of Sustainable Habits – Global Executive Community

Fostering Sustainable Behaviour in Global Executives

The Challenge

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My Contribution

I conceptualised, initiated, and led this ambitious global online co-creation community, leveraging collective intelligence principles as the solution oriented appreciative inquiry & 5-D cycle to drive behavioural change. My role involved designing the entire engagement framework, including the interactive digital platform, structured discussion forums, and collaborative ideation challenges. I was responsible for facilitating cross-cultural dialogue, curating content, and synthesising diverse executive perspectives into actionable strategies. Through break-out groups collaborations and collective workshops, coaching sessions with the team leaders and the deployment of agile co-creation methodologies, I ensured a dynamic and results-oriented environment where executives could not only learn but also actively contribute to the development of practical sustainable habits and leadership models tailored to their operational contexts.

Key Metrics & Engagement

80+**Active Participants**

Engaged directly in co-creation activities and discussions.

300+**Community Observers**

Learned from and contributed indirectly to the initiative.

2**Months of Engagement**

Sustained a dynamic co-creation process during covid pandemics.

Impact & Outcomes



Scalable Leadership Model Developed

Successfully created and piloted a replicable and scalable model for sustainability-oriented leadership development, applicable across diverse organisational structures and global regions.



Enhanced Executive Collaboration

Fostered unprecedented levels of cross-functional and cross-geographical collaboration among executives, breaking down silos and promoting a unified approach to sustainability challenges.



Tangible Behavioural Change

Inspired and facilitated concrete shifts in executive behaviours and decision-making processes, leading to the integration of sustainable habits into daily life, operations and strategic planning.



Global Sustainability Impact

The insights and methodologies developed directly informed the client's global sustainability strategy, driving meaningful environmental and social impact across its operations and stakeholder network.

Science–Industry Collaboration – Open Source Simulation Software & Usage

Fostering Collaborative Innovation in Computational Science

The Challenge

In 2007, the landscape of Open-Source computational science, particularly in advanced engineering simulation domains like fluid dynamics, combustion, and mechanics, faced a significant chasm between academic research and industrial application. The client's mandate was to bridge this gap, enhancing the symbiotic relationship between cutting-edge university research and the tangible R&D needs of industry. Key hurdles included the dissemination of complex open-source tools, the standardisation of best practices, and the establishment of trust and shared objectives between highly specialised academic researchers and industry practitioners. The goal was to accelerate the adoption and refinement of open-source simulation software, thereby driving innovation and efficiency in industrial R&D as well as making engineering simulation tools economically accessible for anyone.

My Contribution

I took the initiative to design and orchestrate a series of targeted science and industry experts' presentations and expert panels aimed at fostering this crucial collaboration. My role involved meticulously identifying leading figures in the open-source simulation community and key industry R&D engineering entities with expertise and critical needs in fluid dynamics, combustion, and mechanics. I facilitated structured dialogues, curated presentation topics, and organised workshops that showcased the latest academic breakthroughs while directly addressing industry's pressing challenges. Through these platforms, I actively promoted knowledge transfer, best practice sharing, and the co-development of solutions, effectively building a vibrant ecosystem where theoretical advancements could directly inform industrial applications and vice-versa.

Impact & Outcomes



Increased Cross-Sector Collaboration

Successfully established new pathways for dialogue and joint projects, increasing the number of active collaborations between academic research groups and industrial R&D teams.



Enhanced Visibility & Adoption

Boosted the profile and credibility of open-source simulation software within industrial contexts, leading to broader adoption and greater investment in its development and application.



Accelerated R&D Innovation

The improved collaboration directly contributed to the faster development and deployment of advanced computational models, shortening development cycles and enhancing product performance for industry partners.



Strengthened Community & Expertise

Fostered a more interconnected and robust open-source simulation community, drawing on diverse perspectives to collectively advance the field and address complex engineering challenges.

Engineering Services & Unique Selling Propositions

Building a Diverse Expert R&D Engineering Team for Competitive Innovation

The Challenge

The client's objective was to establish a regional engineering team with robust R&D expertise, capable of identifying and securing key accounts. This team needed to support clients in driving R&D engineering and product innovation across critical domains: mechanics, electronics, machinery, and automation. A significant challenge lay in attracting and integrating highly specialized talent while simultaneously developing a compelling service offering that stood out in a competitive market. Furthermore, they needed to demonstrate tangible value to potential clients in nascent R&D phases.

My Contribution

I led the strategic initiative to cultivate and expand the engineering services division, proactively anticipating future customer needs for competitive innovation. This involved developing and implementing a sustainable R&D engineering methodology designed to deliver cutting-edge solutions. My role encompassed the recruitment and development of a diverse, multidisciplinary team of engineers, ensuring a rich blend of expertise and perspectives. I crafted the division's unique selling propositions, developed strategic engagement models for key accounts, and personally mentored team members to foster a culture of excellence and client-centric innovation.

Impact & Outcomes



Clear & Compelling USP Established

Successfully defined and communicated a distinct Unique Selling Proposition for the engineering services, highlighting a unique blend of expertise and a deep understanding of early-stage R&D engineering needs.



Acquisition of Key Accounts

The strategically assembled team and clearly articulated value proposition enabled the acquisition of several relevant key accounts, significantly expanding the client's R&D footprint in the region.



Enhanced Diversity & Excellence

Achieved a 30% gender diversity within the team, alongside fostering various other forms of diversity. This rich mix of backgrounds and expertise was leveraged to drive innovative solutions and deliver unparalleled excellence in engineering outputs.



Sustainable Innovation Pipeline

The developed R&D engineering methodology not only solved immediate client needs but also established a sustainable pipeline for continuous innovation, positioning the client as a leader in advanced engineering services.

Automotive Accessibility – R&D Feasibility Study

Driving Inclusive Mobility for drivers with disabilities: Assessing Feasibility of Integration of Advanced Vehicle Adaptations on Mass-Productionline

The Challenge

The client's mandate was to rigorously assess the technical and industrial feasibility of integrating vehicle adaptations for drivers with disabilities directly into standard automotive production lines. This presented a multi-faceted challenge, requiring a deep dive into engineering complexities, manufacturing scalability, cost implications, and regulatory compliance. The goal was to transition from bespoke, after-market modifications to seamlessly integrated, factory-fitted solutions, ensuring enhanced safety, reliability, and user experience. A technical key hurdle involved maintaining the production speed. A market related key hurdle is today's value chain based on individual adaptation production for adaptation to drivers&passengers with disabilities, which relies on a 2-times more expensive vehicle price for persons with disabilities.

My Contribution

I led and orchestrated a comprehensive R&D feasibility study, bringing together a consortium of leading academic researchers in human-computer interaction and biomechanics, alongside key industrial partners renowned for their advanced production engineering capabilities. My role involved defining the scope of the study, coordinating interdisciplinary expert collaboration, and establishing rigorous methodologies for technical evaluation. I facilitated the development of first integration roadmaps and conducted risk assessments. This involved close collaboration with design, R&D engineering, and manufacturing departments to ensure that proposed adaptations met both functional requirements and production efficiencies.

Impact & Outcomes



Industrial Scalability Demonstrated

Successfully demonstrated the industrial scalability of integrating vehicle adaptations for drivers and passengers with disabilities, providing a clear pathway for the client to move beyond expensive niche modifications towards mass-production of inclusive vehicle solutions.



Regulatory Compliance Achieved

Identified key design and engineering principles that ensure full compliance with international automotive safety standards and accessibility regulations, mitigating legal and operational risks.



Enhanced Product Portfolio

The study enabled the client to envision an expanded product portfolio, positioning them as a leader in accessible mobility and opening new market segments for their standard vehicle lines.



Optimised Production Costs

Provided actionable insights into production process optimisation, projecting significant cost efficiencies compared to traditional after-market adaptation methods, making inclusive solutions more affordable.



Thinking Quality in CI & Innovation

Leveraging Social Neurology for Superior Competitive Intelligence and Breakthrough Innovation

The Challenge

The core mandate was to elevate the thinking quality within both Competitive Intelligence (CI) and broader innovation processes. This involved moving beyond conventional data analysis to incorporate the sophisticated insights offered by social neurology. The client sought to understand and mitigate cognitive biases, enhance collaborative decision-making, and foster genuinely novel ideas by leveraging how the human brain processes information and interacts within groups. The goal was to build a more resilient, adaptive, and predictive strategic framework that was fundamentally human-centric.

My Contribution

I initiated and led empirical research exploring the critical intersection of Competitive Intelligence, thinking methods as critical thinking and creative thinking, cognitive neuroscience, and fact-based decision-making. My work comprises a literature research and empirical studies on collective human intelligence.

First empirical study results indicate how neuroscientific principles, particularly those related to social cognition and expert intuition, could be practically applied to CI methodologies, innovation workshops. Also as a starting point for sustainable strategy development, expert intuition seems to be a timely mean to connect the knowledge in an organization with an extrapolation of its strengths and expertises into a sustainable strategy.

Impact & Outcomes



Strengthened Methodological Foundations

The study shows how thinking methods can be used as a lever of quality and sustainability in CI and strategy development. Thinking methods are deeply rooted in neuroscientific understanding, leading to higher quality of analysis, reduced cognitive biases, and enhanced foresight in competitive landscapes.



Optimized Innovation Processes

Successfully applied social neurology insights into teaching methods in innovation and competitive intelligence, fostering a precise approach to systemic understanding of complex contexts as well as the emergence of genuinely breakthrough concepts.



Time-Efficient Strategic Decision-Making

Developed and validated empirical studies demonstrating how to effectively apply expert intuition, enabling leadership teams to make critical strategic decisions with greater speed, confidence and sustainable orientation, while maximizing fact-based decision making.

Social Art & Inclusion – EU Project

Fostering Innovation and Integration through Creative Methodologies Across Europe

The Challenge

The European Union project **Social Art** aimed to address two significant societal needs: enhancing innovation processes within organisations and facilitating the social and economic integration of individuals distant from the labour market. The core mandate was to develop a practical handbook of art-based methods that could serve as a valuable resource across diverse European contexts. This presented a complex challenge, requiring methods to be adaptable to various cultural backgrounds, skill levels, and socioeconomical barriers, while simultaneously proving effective in fostering creativity, collaboration, and personal development to bridge the gap to employment and value creation.

My Contribution

I initiated and co-led this ambitious EU project, working closely with project partners from Germany, France, Italy, and Hungary. My role involved orchestrating the multi-national collaboration, ensuring methodological coherence, and driving the conceptualisation and development of the handbook. I was responsible for designing the research framework, coordinating pilot programmes across partner countries, and facilitating workshops to gather and refine art-based methodologies. This encompassed everything from stakeholder engagement and budget management to content curation and editorial oversight, culminating in a robust and practical guide for practitioners across Europe.

Impact & Outcomes



Comprehensive Methodological Handbook Published

Co-edited and published a pioneering handbook of art-based methods, providing practitioners, innovation workshop trainers, educators, and social workers with actionable tools to stimulate innovation and support vulnerable groups as well as social impact innovation across the EU, establishing a new benchmark in social art methodology.



Enhanced Social and Economic Inclusion

The project developed and validated creative approaches that demonstrably released collective intelligence, ideation as well as creativity. They also improved participants' confidence, communication skills, and readiness for value creation, contributing directly to the social and economic integration objectives of the European Union.



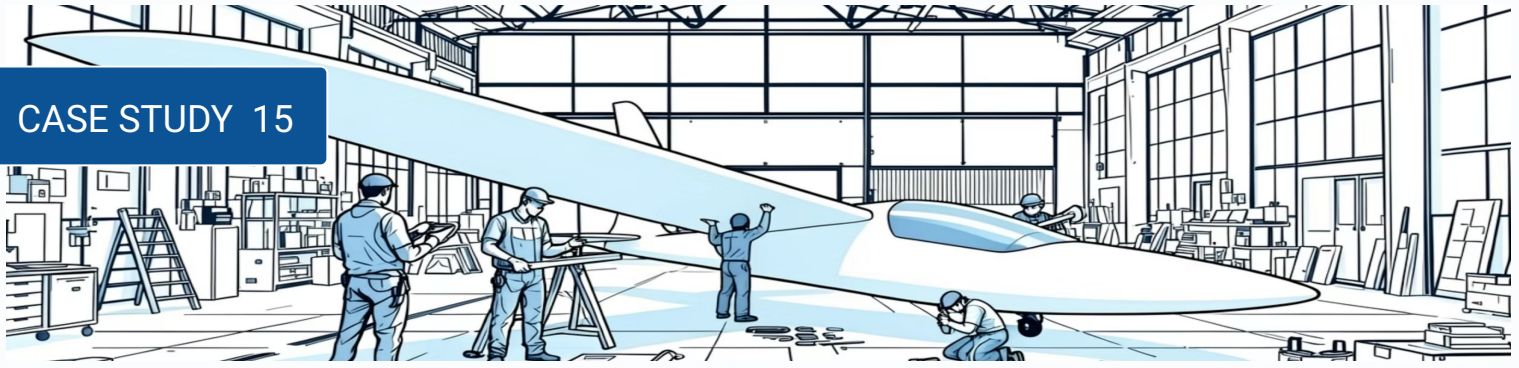
Strengthened European Partnership Network

Successfully fostered a vibrant, cross-cultural collaboration among partner organisations, leading to a sustainable network for future initiatives in social innovation and providing a model for effective multi-national project delivery within the EU framework.



Fostered Innovative Thinking

The art-based methods introduced provided novel ways for organisations to approach solution-finding as well as problem-solving: fostering creativity, moving beyond traditional innovation paradigms to unlock untapped potential within teams and communities.



Glider Prototyping – Aeronautics R&D

Co-Leading the Design, Construction, and Certification of a High-Performance Glider Prototype (first flight 1993)

The Challenge

The project aimed to design and construct a high-performance glider prototype for 2 pilots sitting one next to each other. But with a gliding performance that was till then only possible with pilots sitting one behind the other. This involved navigating stringent aerodynamic demands, aerodynamic optimization of the wing-fuselage region, a novel design for the cockpit with a huge domeshaped plexiglass cover, ensuring structural integrity for a 20-meter wingspan, and meeting rigorous aircraft certification standards. A unique complexity was leading a diverse team of 25 volunteer engineering students, requiring not only technical guidance but also effective project management and mentorship to transform theoretical knowledge into a tangible, airworthy aircraft under strict timelines and resource constraints.

My Contribution

I joined this ambitious initiative at the beginning of my engineering studies at TU Darmstadt, took over responsibilities and was step-by-step taking responsibility for the team and the project, overseeing everything from the prototype construction in the students' workshop to the different testing activities till final aircraft certification and later flight testing. My role involved technical leadership during the construction of the 20m wingspan glider, ensuring adherence to design specifications and engineering best practices. I led the group of 25 volunteer engineering students, fostering a collaborative environment, delegating tasks, and providing hands-on training that empowered them to contribute significantly to the project's success and gain invaluable practical experience.

Impact & Outcomes



Achieved Best-in-Class Glide Ratio

Successfully delivered a glider prototype that achieved a best-in-class glide ratio, setting a new benchmark for performance in its category and demonstrating significant advancements in aerodynamic efficiency and structural optimization.



Successful Aircraft Certification

Guided the prototype through rigorous regulatory inspections and flight tests, leading to successful aircraft certification, a critical milestone that validated the design's safety, reliability, and adherence to industry standards.



Developed Future Engineering Talent

Provided practical, hands-on experience to a team of volunteer engineering students, fostering their technical skills, project management capabilities, and understanding of real-world aeronautical R&D, preparing them for future industry roles.

IT to Overcome Cultural Bias – Public Schools

Fostering Global Understanding Through Long-Distance Digital Collaboration in Primary School Education

The Challenge

The primary objective was to rigorously test the hypothesis that digital collaboration platforms could effectively reduce cultural bias among primary school children. This represented a complex pedagogical and technological challenge. Cultural biases are often deeply ingrained from a young age, and traditional educational methods sometimes fall short in fostering genuine cross-cultural understanding. The project sought to design an intervention that would expose children to diverse perspectives in a structured, engaging way, transcending geographical and cultural barriers, and crucially, to measure its impact on their perceptions and attitudes during their neurally formative years age 6-7.

My Contribution

I founded and led a pioneering "numerical classroom" initiative, establishing a direct digital link between two public primary schools in France and Cameroon. My role encompassed the entire project lifecycle, from conceptualisation and securing partnerships to implementation and impact assessment. I designed the collaborative curriculum, which integrated interactive digital tools for shared learning experiences in subjects like mathematics, literature, and art. I also oversaw the technical setup, teacher training, and ongoing facilitation of inter-school exchanges, ensuring cultural sensitivity and pedagogical effectiveness throughout the program to create a truly immersive and bias-reducing environment.

Impact & Outcomes



Proof of Concept for Early Bias Reduction

The initiative successfully demonstrated that cross-cultural digital collaboration can significantly reduce cultural bias in children aged 6-7, providing a crucial proof of concept for early intervention strategies during a critical developmental period. Pre- and post-intervention assessments showed a measurable increase in cultural empathy & understanding.



Enhanced Global Citizenship Skills

Participating students developed improved intercultural communication skills and mutual respect, increased empathy towards other cultures, and a broader global perspective. These foundational skills are vital for fostering future generations of globally aware and socially responsible citizens.



Validated Digital Pedagogy Model

The project established a replicable model for leveraging digital technology in cross-cultural primary education. It provided valuable insights into effective curriculum design, teacher training, and the practical implementation of digital tools for fostering mutual understanding across diverse educational settings.



Strengthened International School Partnerships

Beyond the direct impact on students, the initiative forged strong, sustainable partnerships between the participating schools and educational authorities in France and Cameroon, laying the groundwork for future collaborative projects and exchanges.