

Benefits Management Model in the Industry 5.0 Era

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Abstract: The Industry 5.0 Era has introduced greater complexity across both business and technological domains, characterised by continuous evolution and an increasing emphasis on human and machine collaboration. In this context, organisations are required to enhance their capacity for rapid and innovative responses to emerging dynamics. Managers, therefore, rely on advanced technologies to strengthen analytical capabilities, enabling data-driven insights and timely, well-informed decision-making grounded in historical evidence. The integration of human expertise with augmented intelligence enhances organisational value creation and reinforces a human-centric perspective. What opportunities and challenges does this new context present for the methodology? Could Augmented Intelligence offer advantages by supporting managers in applying Benefits Management more effectively? The Cranfield School of Management's Benefits Management methodology offers a structured framework to guide strategic decision-making in complex projects, that is more focus on financial benefits, and, in Industry 5.0, it's a research gap because isn't focus on human centric. This research aims to explore the opportunities and challenges of this new context, proposing an enhanced Benefits Management model that prioritises human-centric value, sustainability, resilience, and continuous feedback, supported by augmented intelligence. The research will use the Preferred Reporting Items for Systematic reviews and Meta-Analysis Method in Literature Review and the Design Science Research Methodology to produce scientific knowledge by creating, developing, and evaluating one model. The model will be validated with people involved with Industry 5.0 and Benefits Management in organisations from different sectors (predominantly in the tertiary sector), for example, Decision Makers, Intermediate and Senior, Strategy and Innovations and Benefits Project Managers from sectors like Information and Communication Technologies, Finance and Banking, and Health. The data will be analysed, and the feedback will be incorporated into the model indicating the benefits identified, the different between the sectors, if exist and the opportunities that can be explored. It will be also suggestions future research that can be done and sector where the model can be applied. The expected contribution of this research is to have a Benefits Management Model improvement to provide an answer for the challenges of Industry 5.0.

Keywords: Industry 5.0; Benefits Management; Augmented Intelligence; Digital Transformation; Organisation Change.

1. Introduction

The way technology changes quickly and impacts humans, the way artificial intelligence automates repetitive processes, and the way we can learn more rapidly with artificial intelligence, motivate us to learn more and investigate these areas that can combine human intelligence and augmented intelligence. How can humans and machines collaborate to create value?

The emergence of Industry 5.0 has introduced a new paradigm centred on people, resilience, and sustainability, while the growth of augmented intelligence is profoundly transforming how organizations operate and make decisions. In this context, companies are challenged to rethink their business models and processes to ensure their relevance, efficiency, and value creation capacity.

Despite this transformation, there is a gap in how projects are evaluated and how benefits are identified, measured, and managed in environments characterized by high complexity, rapid change, and a strong technological component. Traditional Benefit Management approaches may prove insufficient to support rapid and informed decisions in this new context.

The problem arises of understanding how benefits management can be adapted or redefined in the context of Industry 5.0, to support more agile, effective decision-making oriented towards the creation of sustainable value in organizations. The Benefits Management Model expected to be improved with augmented intelligence processes that will increase the decision makers capacity to identify and control the Benefits Management project considering the Industry 5.0, adding the focus on Human-centric and resilience factors.

This research will be important for those conducting investigations in this area and for people who work in the Technology and Management areas, focusing on decision-makers and managers who need to determine project Benefits management.

2. Literature Review

This chapter describes the state of the art on the following topics: Industry 5.0, Augmented Intelligence, Benefits Management, and Industrial Sectors.

2.1 Industry 5.0

The evolution from Industrial 1.0 to Industry 5.0, from 1765 to 2020, Figure 1 (Kovari, 2024), starting with the use of Machinery in Industry 1.0, using Mass Production and Electricity in Industry 2.0, Computers & Automation in Industry 3.0, the Internet and Machine Learning in Industry 4.0 and Human Machine Co-operation and Cognitive System in Industry 5.0.

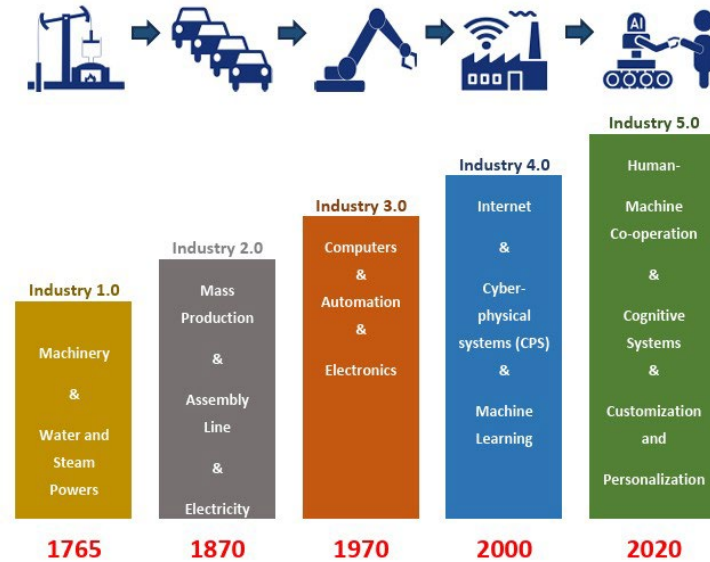


Figure 1: Industrial Revolution (Kovari, 2024)

According to Xu et al. (2021), Industry 4.0 is considered technology-driven, while Industry 5.0 is value-driven. Industry 5.0 centres around three interconnected core values: human-centricity, sustainability, and resilience (Figure 2).



Figure 2: Industry 5.0 (Xu et al., 2021)

It builds upon the advancements of Industry 4.0 by emphasising human well-being, environmental sustainability, and the creation of societal value beyond economic growth. People will develop new roles as a shift in value and need to upskill and reskill themselves for better career opportunities and work-life balance. Technology is to serve people and societies. Pinto et al. (2024) mention that it is critical to develop continuous learning and skills in emergency technologies, learning interdisciplinary skills, and contributing to multidisciplinary teams.

In the context of the Industry 5.0 paradigm, which advocates a human-centred approach to technological innovation, (Santos, Freitas and Fernandes, 2025), refer to the importance of balancing innovation, emotional resilience, cooperation, and social engagement skills and give relevance to continuous innovation, ethical considerations, and social and environmental sustainability are deeply intertwined, necessitating a balanced skill set that includes technological proficiency, creativity, emotional intelligence, adaptability, empathy, collaborative ability, effective communication, and leadership. Longo et al. (2020) mention that Industry 5.0 can be the Age of Augmentation, where Human-machine symbiosis enables collaboration in manufacturing (Figure 3).



Figure 3: Fifth Industrial Revolution or Industry 5.0 (Longo et al., 2020)

Leng et al. (2022) mention that exploration of Industry 5.0 is still in an initial stage, and research findings are relatively scarce and less systematic. Piccarozzi et al. (2024) mention that there exists a relation between Industrial 4.0 and Industrial 5.0, emphasised by enabling technologies that will have challenges and opportunities. Industrial 4.0 creates the foundation for industrial 5.0, as it was done for the other previous industrial revolutions. Rieder and Schmuck (2024), in their article, refers that it was not possible to prove that Industry 5.0 will have an impact on companies' processes, but mention that Industry 4.0 had.

According to Ivanov (2023), Industry 5.0 is a combination of organisational principles and technologies to design and manage operations and supply chains as resilient, sustainable, and human-centric systems. Mention that the major technological principles of Industry 5.0 are collaboration, coordination, communication, automation, data analytics processing, and identification.

2.2 Augmented Intelligence

Augmented intelligence (also known as intelligence augmentation or cognitive augmentation) is the next level in artificial intelligence. The ultimate objective of augmented intelligence is to use machines to enhance the work, expertise, and experience of a human user or worker. Augmented intelligence is also known as intelligence amplification, cognitive augmentation, intelligence augmentation, machine augmented intelligence, or enhanced intelligence. It is essentially artificial intelligence (AI) with a twist. It refers to the creation of a close-to-human autonomous intelligence using modern technology. (Sadiku et al., 2021)

2.3 Benefits Management

A benefit is the advantage of a stakeholder or a particular group of stakeholders (Ward and Daniel, 2006). According to Ward and Daniel (2012), Benefits Management is an important process to ensure that the potential benefits of an implementation are identified and managed to achieve the objectives. It is important to organise and manage these benefits to maximise the positive results of technology implementation. The costs associated with investments in information systems should be identified, and the potential benefits and feasibility should be analysed (Oh, 2007).

Benefits Management complements and integrates with other areas and methodologies of Management, see Figure 4, such as Strategic Planning, Project, Program, and Portfolio, Investment Evaluation, Risk Management Techniques, Project Management Methodologies, Systems Development Methodology, and Change Management Methods.



Figure 4: Integration of Benefits Management (Ward and Daniel, 2006)

The Cranfield School's Benefits Management approach (Ward and Daniel, 2006) has 5 phases, which are represented in Figure 5.

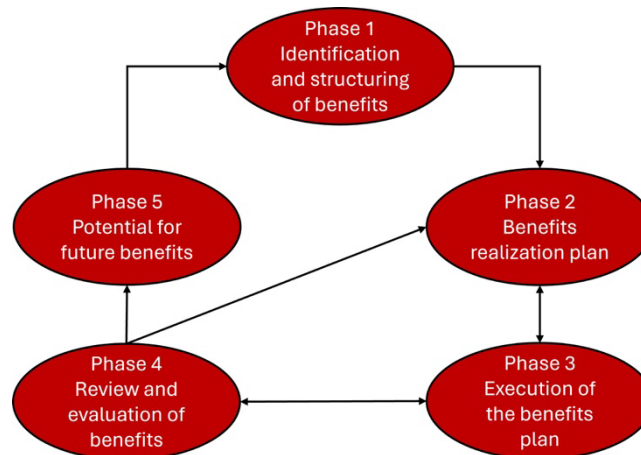


Figure 5: Benefits Management Process (Ward and Daniel, 2006)

2.4 Industrial Sectors

Industry 5.0 has impacted society, in different sectors and at different levels. Organisations must constantly innovate and adapt to emerging new technologies, adapting their organisational processes, the way they communicate with their customers, and becoming more competitive to meet the needs of increasingly demanding customers who want access to information and to make purchases at any time of day and from anywhere.

Covid forced companies to accelerate digital transformation because they had to reinvent their businesses, making them more digital to reach their customers more quickly and easily. Many businesses had to reassess their business processes, models, and systems. (Mihiu et al., 2023).

Digital transformation has become a driver of business development, reshaping sectors and redefining the ways companies work. Companies are increasingly adopting digital technologies, such as Cloud, Artificial Intelligence, IoT, and data analytics (Big Data), to optimise operations, improve customer experience, and drive innovation (Joel et al., 2024).

The World Economic Forum (2026) presents the estimated industry growth potential by 2030, based on the World Economic Forum, Executive Opinion Survey 2025, and International Monetary Fund (IMF), indicate the sectors that will potential growth, such as IT Services, Medical and Healthcare Services, Financial Services, Professional Services, and Telecommunication.

Bartuś et al. (2025) have done research in five sectors (IT, automotive, industrial, service, and banking/financial) and defined the Model for implementing the assumptions of Industry 5.0 in organisations, with new insights into the practical implementation of Industry 5.0. Benefits such as improved product quality, increased production efficiency, and cost optimisation are primarily recognised by companies in the IT and industrial sectors. The research recommendations mentioned that there is space for more investigation in this area to explore in more detail.

Some sectors will be more impacted by Industry 5.0, with more transformation, whether due to technological intensity or the need to balance automation, human intervention or sustainability. Below are some transformations that have been happening in different sectors.

2.5 Financial Sector

Banks have also become digital, allowing people to conduct their transactions without having to go to a physical location. It is possible to perform all operations through an application on a cell phone or laptop, such as creating a savings account, term deposit, checking transactions, making transfers, contacting the account manager, sending documentation in digital format, consulting and purchasing insurance, real estate, and processing purchase and sale contracts.

New business areas have been developed, such as FinTech (Financial Technology), with the creation of digital financial products and services, investments, loans, and financial management, which currently use technologies such as artificial intelligence, data analysis, and automation. Another business area that has been developed is RegTech (regulatory technology), which allows companies to use technology to comply with regulations in an automated and efficient way (Osei et al., 2023).

2.6 Healthcare Sector

The healthcare sector has been undergoing a major digital transformation, using technology for research, platforms that provide comprehensive user information, centralised hospital information management, and staff work organisation, as well as hospital management of all products and services used (Kraus et al., 2021).

The Healthcare 5.0 brings the transformation of healthcare with the introduction of the Internet of Things (IoT), Artificial Intelligence and 6G Communication together under the principles of Industry 5.0, the human-centered, sustainable, and resilient. (Younesi et al., 2025)

2.7 Professional Services Sector

Many service organisations continue to use various Excel files and Microsoft Project to manage the day-to-day management of leads, business development, project management, and resource management. Professional Services Automation (PSA) platforms can help organisations centralise and standardise information (Sharif, 2002). According to Wang and Swanson (2007), a PSA platform proposes to help service-oriented organisations manage their projects and employees. PSA allows to automate a set of repetitive process activities that can take time away from professionals to focus on activities that require more skills (Sampson, 2021).

The organisational context needs to be prepared to have the human in the middle of a strategic decision. The correlation between machine and human tends to grow, and the business and human process needs to be optimised, being more agile in data analysis (Ladaga et al., 2025). With the Professional Service Automation tool, it will be more efficient the human resource management with more information regarding the projects, skills, and it's a tool that will help the economic and financial organisation context. Salvadorinho et al. (2024) suggest that organisations should have a platform with three pillars: Protean Career Attitude (empowering employee to take the responsibility for planning and advancing their professional careers); Learning Organisation (fostering knowledge sharing and collaboration while providing structured learning paths to drive growth and innovation), and participatory design (engaging employees in decision-making processes to innovate and create a more user-centred workplace). These pillars align with Industry 5.0 core pillars, resilience, human-centricity, and sustainability.

3. Conclusion of Literature Review

The Industry 5.0 brings changes to organizations which are more focused on human-centric and the cooperation between humans and machines. The Industry 5.0 is related with the augmented Intelligence, expanding the human capacity with more information, using technological tools, like professional service automation, helping organisations improving and be more efficiency, and prepare to capture benefits. The Benefits Management Model for Industry 5.0 can be derived designed from the Cranfield Benefits Management Model since it is a structured model with many years and that can be improvement with challenges and opportunities for Industry 5.0 focus on human centric and augmented intelligence.

The articles identified during the literature review were more focus on Industrial 5.0 in manufacturing and less on service organisation.

4. Objectives

The objective of the research is to design, develop, and evaluate a Benefit Management Model to foster the Industry 5.0 Era.

The research will have as sub-objectives the following points:

- Analyse the state of the art of Benefits Management in the context of Industry 5.0 Era, identifying the gaps and challenges of Benefits Management in the Industry 5.0 Era
- Define the guidelines for Integrating of Industry 5.0 dimensions into Benefits Management and incorporate Augmented Intelligence into Benefits Management Processes
- Design and develop a Benefits Management Model to incorporate Industry 5.0
- Demonstrate how the model supports Benefits Management in different sectors
- Evaluate the proposal Benefits Management Model in different sectors

4.1 Research Questions

The main objective of this study will be to provide answers as pertinent as possible to the following questions:

Which Benefits Management Model will be suitable for the Industry 5.0 Era?

The thesis will have as sub-questions that we would like to provide an answer to:

- What are the challenges and opportunities for the Benefits Management in context of Industry 5.0?
- What design principles should guide the development of the Benefits Management Model aligned with Industry 5.0?
- How can a Benefits Management Model be design and develop to address the Industry 5.0?
- How can the proposed Benefits Management Model be demonstrated in organisations context?
- How effective and useful is the proposed Benefit Management Model in supporting value realisation and decision-making within Industry 5.0 contexts?

5. Research Methodology

Industry 5.0 presents a set of both challenges and opportunities that are expected to reshape not only the nature of work but also the tools and technologies that underpin everyday activities. According to Rane (2023), the case of ChatGPT exemplifies this duality across Industry 4.0 and Industry 5.0 within different sectors. On the other hand, they raise significant concerns, particularly regarding the ethical implications of algorithmic decision-making. Nevertheless, they simultaneously create opportunities, such as strengthening fraud prevention mechanisms in the financial sector. The evolution of Industry 5.0 is closely linked to innovations enabled by augmented intelligence. Augmented intelligence integrates human and artificial agents within a socio-technological system, where both entities co-evolve by continuously learning and optimising decision-making processes. This interaction is increasingly facilitated through intuitive modalities, including conversational and voice-enabled interfaces (Bousdekis et al., 2025). The thesis will have a Literature Review to see the State of the Art regarding Benefits Management, Industry 5.0, and Augmented Intelligence. The Benefits management models that exist will be identified. A case study will be done in one organisation to apply the Benefits Management Model and evaluate the improvements that can be made to the model in the context of Industry 5.0, seeing what can be incorporated regarding resilience, human focus, and sustainability. This organisation is working on Industry 5.0, focusing on human and machine collaboration. To continue the doctoral research, the

universe of organisations and different sectors that are working on Industry 5.0 and the universe that makes sense for the thesis research. Afterwards, the challenges and opportunities that Industry 5.0 brings to Benefits Management for organisations from different sectors.

Based on the state of the art and the interviews that will be done with the organisations' representatives and other domain experts, a new Benefits management model will be proposed to incorporate the innovations related to Industry 5.0 and augmented intelligence. After, a Focus Group will be done with people from organisations from different sectors to validate the model and analyse what they have in common and what the differences are between them. The feedback received will be incorporated into the model.

5.1 Research Techniques

The Descriptive Method was used to compile the information collected on the state of the art. A Systematic Literature Review using the Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) Method (Moher et al., 2010) will be made.

It was used indexed scientific databases to search for scientific articles, for example, Scopus and Web of Science, where we can find references for articles, conferences, and books related to science, technology, humanities, and other themes. We are planned to use the search strings like Industry 5.0 on Web of Science (<https://www.webofscience.com/wos/woscc/summary/7a753cc0-f3cb-4edc-a8f3-55a9e0287047-019d0d4182/3bdca765-e051-47ad-bb17-6237b3a90d8b-019d0d4123/relevance/1>); or string search by Industry 5.0 on Web of Science refine by Published Years between 2026 and 2022; Document Types: Review Article (<https://www.webofscience.com/wos/woscc/summary/0b4202e9-fda4-446c-a534-3e4344c4670d-019d104b33/3bdca765-e051-47ad-bb17-6237b3a90d8b-019d0d4123/relevance/1>). We are planned also to search by Benefits Management and join with Industry 5.0 and Augmented Intelligence. We will considering the latest articles, with peer review. The Literature Review will contribute with the state of the art and the gaps to support the research.

5.2 Case Study Methodology

According Njie and Asimiran (2014), the Case Study Methodology is a good choice in Quality Methodology because bring answers to the how and why of conundrums. Case study research involves a detailed and intensive analysis, and its focus is on a specific event, situation or organisation. (Schoch, 2020). A case study is an analysis made over a certain time period. Case studies tend to be selective, focusing on one or two issues that are fundamental to understanding the system being examined. (Tellis, 1997). The Case Study research has six steps: Plan, Design, Prepare, Collect, Analyse, and Share. These steps should be an iterative process to get more information. (Yin, 2009). In this research, a case study in one organisation will be applied to identify requirements to create a Benefit Management Model, incorporating the impact and the innovation of Industry 5.0 and the integration of Benefit Management in the 5.0 context.

5.3 Design Science Research Methodology

Design Science Research Methodology will be used to produce scientific knowledge by creating, developing, and evaluating of the proposal model. The Design Science Research methodology will follow the next six phases according to the approach of Peffers et al. (2007), which we can also see in Figure 6.

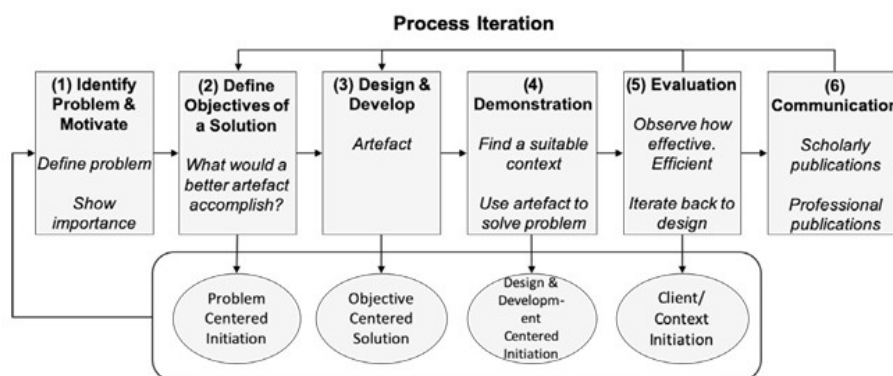


Figure 6: Design Science Research approach Peffers (Delpont et al., 2024)

It was identified the problem and the motivation for this research. The Literature review helps to identify the gaps and challenges. The objectives and research questions were aligned with the Design Science Research Methodology. For the design and develop, we will analyse the Benefits Management model that already exists during the literature review and will design and develop a Benefits Management model for the Industry 5.0 era. After will demonstrate the proposal model in different sectors (predominantly in the tertiary sector), using the interview method. It will be identified at least two sectors that are in the listed-on top of potential grow sectors and that have the characteristics of Industry 5.0 and make projects, for example, Information and Communication Technologies, Finance and Banking, and Health. After, it will made the Model evaluation in different sectors using the Focus Group.

5.4 Qualitative Method

It will use qualitative design research using a descriptive method, interview, observation, and interpretation techniques.

5.5 Interview

Semi-structured interviews will be carried out, and prior preparation of the questions to be asked will be made. The interview technique will be used to obtain information from the areas involved and impacted. It is intended to identify information to evaluate the challenges and opportunities that Industry 5.0 causes in companies that have professional services and that use Benefits management processes. It will include questions regarding the use of the Benefits Management Model to evaluate and enrich the model with the improvements that make sense to incorporate.

It will be identified a company in the sector selected for the research and it will be selected the participant for the interviews that are involved with Industry 5.0 and Benefits Management in organisations, with the roles of Decision Makers, at Intermediate and Senior Level. The interviews will be scheduled in advance, indicating the purpose of the interview. The interview will be done face-to-face, in a one-on-one meeting, conducted by the researcher. (Creswell and Creswell, 2023). Each of the interviews will be recorded through Video and Audio, with authorisation requests, to be used later in data analysis. After collecting the data from the interviews, a qualitative analysis will be made using Gioia Methodology, to provide an answer to the research questions, bringing credibility to the research done and a structured approach to the research, to bring more academic knowledge and organisational knowledge, with the goal of generating a new model. It followed the Steps of Gioia methodology (Gioia et al., 2013): Research design, Data Collection, Data Analysis and Grounded Theory Articulation.

5.6 Focus Group

The Focus Group technique will be employed to validate the proposed Benefits Management Model and to collect further insights into Industry 5.0. This includes examining how organisations apply Benefits Management, the practices adopted, the challenges and opportunities that Industry 5.0 entails, and the emerging technologies that may be integrated within this paradigm to strengthen the model's validity. Participants will be drawn from organisations across different sectors that actively employ Benefits Management and are engaging with Industry 5.0, such as managers and decision-makers. Each Focus Group will comprise participants from a single sector, thereby ensuring sector-specific perspectives. Following the completion of the Focus Groups, the collected data and feedback will be systematically analysed to identify necessary improvements to the model and to compare both the commonalities and divergences across sectors.

6. Project Execution Plan

The research will be carried out over four academic years, starting in 2025/2026. During the project, we will have the Project Progress report every year to make the evaluation of the project with an Evaluation Panel to provide the progress of the activities that have been done and the activities that are planned. This work should be supervised by the advisor to ensure proper development.

6.1 Completed Activities

First curricular year activities; Identification of research topic; Identification of Commission Research Evaluation; Objectives and Research questions

6.2 In Progress Activities

Literature review, Methodology

6.3 Planned Activities

Identification of sectors; Interview, Focus Group, Design and Build the Conceptual Model. Evaluate the model and communication. The scientific dissemination in a refereed journal, and conferences.

7. Conclusion

This research aims to contribute to the investigation of Science and Technology, as it will develop knowledge in Technology and Management, bringing innovation to management, organisation, re-engineering, technology, and strategy. The research will contribute to increasing the knowledge in areas as Benefits management and Industry 5.0. The research will have limitations since will be only made the two sector and the evaluation of the Benefits Management Model for Industry 5.0 can be applied in more sector to be analysed and to have more or another conclusions. This research can be the knowledge base for future research.

Ethics Declaration

During the research, it will be requested to the organizations to conduct the case study for the doctoral research and to carry out the interviews and the focus group, with the understanding that the anonymity of the individuals and organizations will be maintained. Until this moment, the research doesn't have information related to any organization. It will have in the future.

AI Declaration

No AI tools were used to produce this document.

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