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Empowering Organizational Feedback with Artificial Intelligence

Literature Review and Validation on Corporate Culture Management, Challenges, and Opportunities of Artificial Intelligence – Mediated Practices for Organizations

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Abstract

This thesis explores the integration of Large Language Models (LLMs) in Human Resources to improve employee feedback processes. It examines challenges in analyzing qualitative feedback in large organizations and proposes *Thrivio*, an AI-driven Minimum Viable Product (MVP), as a solution. The research combines a comprehensive literature review, mixed-methods empirical research, and the development and testing of *Thrivio*. Focusing on enhancing HR decision-making through AI analytics, the thesis presents a novel bottom-up approach to employee feedback, culminating in a market strategy and future roadmap for *Thrivio*, thereby contributing to the field of impact entrepreneurship and innovation.

Keywords: Artificial Intelligence, Organizational Feedback, Qualitative Analysis, Platform Development, OutSystems, User Interface Design, Data Visualization, Feedback Collection Methods, User Experience Design, Sentiment Analysis, Human-Computer Interaction, Testing, Text Analysis, Business Plan, Low Code, No Code, SaaS, Large Language Models, Opportunity Identification

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List of Abbreviations

ABBREVIATION	DEFINITION
API	Application Programming Interface
E.G	Example Given
ET. AL.	Et Alia (and others)
HRM	Human Resource Management
I.E.	id est (that is)
MVP	Minimum Viable Product
RAD	Rapid Application Development
UI	User Interface
USP	Unique Selling Point
UX	User Experience
SOTA	State-of-the-art

Individual Part (Mona Hermandinger)

1. Literature Review

1.1. Introduction to Employer Management: Problems and Opportunities

The current socio-economic landscape is undergoing transformative shifts, predominantly characterized by deregulation, digitization, and innovation, profoundly influencing human resource management (Bharadwaj and Ali Khan 2022; Microsoft 2021). A pivotal challenge in HR is the rising demand for professionals juxtaposed against the demographic downturn, as the retirement of baby boomers creates a gap in the workforce that subsequent generations cannot fill (Tcharnetsky 2023).

Work culture is being remodeled, propelled by these demographic shifts (Vyas 2022), necessitating adaptable leadership styles. The ‘servant leadership’ model exemplifies this, evidencing a boost in innovation, self-efficacy, strengthened work culture and productivity (Sudarmo 2022). Modern employees expect empathy for their unique challenges, but there is a disconnect between these expectations and what leaders and HR practitioners provide (Microsoft 2021, Vasilev 2021). These challenges add new requirements to management and employees, especially in terms of communication, which makes it emerge as a pivotal tool in driving organizational evolution (Vasilev 2021).

This review will scrutinize transformative processes, highlighting problems and opportunities within HR dynamics. Trends indicating employee shortages, dwindling retention, and job satisfaction, alongside the important role of AI in HR, signal a critical juncture for industry practices. (Microsoft 2021) A driver for this was for example, that at the end of the COVID-19

pandemic, over 40 percent of the global workforce had considered leaving their employer in 2022 (Microsoft 2021) which stresses the need for urgent action to target these challenges. These turnovers not only incur costs but precipitate knowledge deficits that hinder productivity and elevate risk perception, leading to stressed workforces less capable of innovation (Massingham 2018, AI Microsoft 2023). The ensuing analysis will assess HR practices, particularly regarding employee satisfaction and its ripple effects on organizational growth, retention, and corporate culture. The literature reveals an interplay between organizational culture and retention, influencing employee turnover and spotlighting challenges ripe for opportunity analysis.

Key challenges include diminished employer satisfaction and the rise of AI-mediated HR practices, with the latter offering cost-effective solutions by reallocating HR time from routine tasks to strategic initiatives (Malik 2020). The advancement and application of cognitive deep learning algorithms, as utilized in Chatbots, reflect this trend (Dutta 2022). The shift towards personalized HRM practices, facilitated by AI applications like Chatbots, suggests improved employee experiences through AI-mediated social exchanges (Malik 2020).

In sum, this review foregrounds the potential for organizational and societal advancement through enhanced employee management practices, emphasizing diversity and inclusion. This lays a solid groundwork for subsequent field research, product development, and MVP testing.

1.2. Unraveling corporate challenges: Exploring the Interplay of Corporate Culture, Employer Retention and Job Satisfaction

The synergy between corporate culture, job satisfaction, and employee retention is pivotal to an organization's triumph. This segment delves into their interconnectedness, delineating their collective impact on an organization's prosperity and sustainability.

1.2.1. Corporate Culture

Corporate culture, as defined by Kotter (1992) is the ensemble of values and behaviors pervading a firm. Its spectrum ranges from deeply ingrained values, resistant to change, to more observable practices readily adopted by new recruits (Kotter 1992). It is a fact that corporate culture also plays a vital role in the overall performance and productivity of employees (Cherian 2021). Therefore, potency of corporate culture in enhancing performance is undisputed, with many executives attributing increased company value to it (Graham 2022).

Current workplace climates, fraught with volatility, challenge both employees' productivity and leaders' ability to foster it amidst economic tumult (AI Microsoft 2023). A nurturing work environment is crucial, directly influencing employee retention and satisfaction (Al Hamdan 2017). With the cutthroat nature of modern business, a robust corporate culture is no longer a luxury but a necessity for success and talent acquisition (Sadri 2001).

In essence, while corporate culture faces a multitude of contemporary challenges, its role in organizational achievement is paramount. The intricacies of how a faltering corporate culture can undermine retention and, consequently, success, will be further explored in the following sections.

1.2.2. Employer Retention

Employee retention is the sum of an organization's ability to keep its employees. The investment made in hiring and training staff is essential to this since, should they leave before completing their training, the company would suffer a significant loss of experience and expertise. (Gorde 2019) The financial repercussions of employee turnover can surpass 150% of the departing

employee's annual salary (Duda 2013). As such, understanding and addressing the reasons behind employee turnover is critical.

Retention transcends the confines of records: it is important for decision makers to understand that employee retention is not just a matter that can be dealt with in records and reports. It purely depends upon how the employers understand the various concerns of the employees and how they help them resolve the problem when they are in need. (Gorde 2019) After becoming aware of these concerns, it is crucial to understand that today's employees seek tailored, consumer-grade experiences at work (Zel 2020). Effective people management that aligns with evolving employee expectations is therefore foundational to retention and, by extension, organizational growth, and success (Gorde 2019).

In essence, the retention of satisfied employees remains one of HR's most formidable challenges, with job satisfaction being a key determinant (Lahkar 2013). Thus, a deeper examination of job satisfaction is imperative to unravel its impact on employee retention.

1.2.3. Job Satisfaction

Job satisfaction emerges as a fundamental element when examining corporate culture and employee retention, with alarming statistics indicating that a significant number of employees perceive a lack of concern for work-life balance by their employers. With over half feeling overworked and a substantial portion exhausted, the pursuit of employee satisfaction becomes paramount for organizational resilience. (Microsoft 2021) Locke's seminal definition of job satisfaction as a positive emotional state from job appraisal underlines its significance (Locke 1976). Antoncic's research reinforces this, showing a tangible correlation between employee satisfaction and firm growth (J. Antoncic 2011). Furthermore, firms are found to enhance their innovative capacity and growth by fostering employee satisfaction, transcending age, size, or

industry (J. Antoncic 2011). An aspect of high job satisfaction worth mentioning is the internal career development of employees, as it is one of the best predictors of an employee's effective commitment (Lahkar 2013). These insights underscore the multifaceted nature of job satisfaction and its profound impact on organizational success.

1.2.4. Summary of the Interplay of Corporate Culture, Employer Retention and Job Satisfaction

This review has elucidated the interdependence between corporate culture, employee retention, and job satisfaction. It has been discerned that satisfaction at the individual level is a starting point; dissatisfaction can trigger an exodus, undermining retention and, consequently, eroding corporate culture. This erosion initiates a vicious cycle, escalating turnover costs and diminishing productivity.

The literature indicates a concerning downtrend in job satisfaction and retention, presenting significant challenges that must be surmounted to sustain productivity and innovation in a competitive landscape. The significance of employee engagement extends beyond immediate business outcomes, influencing Environmental, Social, and Governance (ESG) practices, which are crucial for societal impact and investment decisions (Singh 2023).

In conclusion, engaged employees are indispensable to a thriving corporate culture. There is evidence demonstrating the real, tangible impact to business returns and shareholder value when organizations build or strengthen their employee engagement. (Kleemann 2019) The subsequent sections will delve into how HR professionals address these challenges, with a particular emphasis on the burgeoning role of AI in HR practices.

1.3. Revolutionizing HR: Unveiling the Transformative Impact of AI on Employee Engagement, Cost Saving and Organizational Practices

Artificial Intelligence (AI) is profoundly transforming HR practices, fostering enhanced employee experiences post-implementation (Malik 2020, Bamber 2023). This transition, while significant, doesn't solely impact the workforce positively but also translates to considerable cost savings, exemplified by IBM's substantial financial benefits from AI integration In HR in 2017 alone, IBM realized $107 million in savings because of AI implementation. (Guenole 2021) The influence of AI therefore is something that can massively change current organizational practices, especially for current HR processes. It demonstrates that the features of AI applications, such as being able to use it anytime, access it from anywhere, offer personalization, individualization and objectivity for everyone, do set them apart from existing practices and have the potential to augment HR policies and practices significantly. (Dutta 2022)

1.3.1. AI Practices and Leadership

In the context of AI's swift integration into business operations, concerns about potential reductions in workforce and its impact on corporate culture are prominent. However, contemporary research provides reassurance, highlighting a trend among business leaders who favor AI for its ability to boost employee productivity rather than for downsizing. (AI Microsoft 2023) Employees appear to embrace AI, preferring its assistance in easing workload over fears of job loss. They are inclined to utilize AI for routine administrative tasks and are also open to its support in analytical and creative roles. The consensus is that AI can alleviate the more menial aspects of work, thus freeing up time for more valuable tasks. (AI Microsoft 2023)

Consequently, organizations are encouraged to tailor AI implementation to the unique demands of their operations. Such a strategy should be underpinned by detailed internal research, ensuring AI is applied precisely where it can provide the most benefit and alleviate specific organizational pain points. (AI Microsoft 2023) This approach will ensure that AI integration is not only strategic but also enhances the employees' work experience and the organization's overall efficiency.

1.3.2. Generative AI and Deep Learning Algorithms

The adoption of generative AI in HR processes promises significant advancements by automating tasks, reducing biases, and enhancing productivity, potentially leading to more inclusive, diverse, and efficient workplaces (Ren 2023). A key strength of generative AI models lies in their ability to process vast amounts of data (Gozalo-Brizuela 2023). ChatGPT, a leading example, uses a large language model with deep learning for tasks like translation, summarization, and Q&A, offering benefits like improved language comprehension and adaptability (Hashana 2023, Schwartz 2023). The transition to generative AI is set to expedite the integration of traditional technologies, necessitating readiness for the upcoming AI-dominated era (Bozkurt 2023). Emphasizing the importance of preparation, these algorithms present opportunities and challenges alike, with significant productivity gains and cost savings being notable advantages for organizations (Dwivedi 2023, Malik 2020).

1.3.3. Large Language Models (LLM)

Generative AI, particularly Large Language Models (LLMs), holds significant promise for revolutionizing organizational processes. These models, trained on vast datasets, excel in language understanding and generation, and can follow complex instructions to perform various tasks (Sidahmed 2022; Zhang 2023). While LLMs like Google Bard or ChatGPT have been

employed in recommender systems, aligning them with detailed user needs in practical scenarios remains underexplored (Zhang 2023). ChatGPT and similar LLMs facilitate interactive, natural language conversations, capable of generating coherent responses and recommendations (Schwartz 2023; Wang 2023). The intricacies of LLMs and recommendation models are reserved for a more practical exploration in the product development Chapter of this review.

1.3.4. Summary of the Transformative Impact of AI in HR practices

The advancement of AI and deep learning algorithms such as LLMs has been identified as significantly enhancing HR practices. These technologies contribute to improved employee experiences, heightening satisfaction, commitment, and reducing turnover intentions. (Malik 2020) AI chatbots serve as interactive tools within organizations, providing a personalized platform for employees to express opinions and concerns, fostering engagement, and cultivating a robust, inclusive workforce through superior communication practices (Dutta 2022; Okoro 2012).

1.4. Organizational Communication Practices: Key Considerations

Effective communication stands as a vital component of corporate culture, employer satisfaction, and retention, with barriers such as bias and information overload impeding successful interactions. Investments in HR development aim to enhance feedback mechanisms, crucial for agile response to changing organizational needs (Jug 2018, Watson 2022). AI-mediated tools, like LLM-driven chatbots, show promise in breaking down these barriers, providing a platform for transparent and productive exchanges (Dutta 2022; Okoro 2012). As organizations navigate demographic shifts and new work modalities post-COVID-19, clear visibility into processes and unified systems emerge as solutions to align workforce goals and

facilitate a feedback-rich environment (Vasilev 2021, Watson 2022). The two-way nature of feedback, akin to therapeutic dialogue, underscores the importance of a receptive approach to feedback for cultivating a collaborative and responsive workplace (Jug 2018). This Chapter underscores the imperative to evolve organizational communication strategies, leveraging AI to enhance connection and address the challenges of the modern work environment.

1.5. Navigating the Landscape of Employer Management and AI in HR: Insights, Biases, and Prototyping Guidance

While the literature review illuminates critical facets of employer management and AI in HR, it is imperative to acknowledge certain limitations and biases inherent in the sources. Notably, the majority of cited materials originate from corporate and scholarly sources, potentially introducing a bias towards perspectives aligned with corporate interests. The review emphasizes the positive outcomes of AI integration but lacks a comprehensive exploration of potential drawbacks, ethical concerns, and diverse viewpoints. However, it is noteworthy that for the purpose of developing our solution/product, the literature review has provided essential guidance, especially during the initial prototyping phase. As we progress, it becomes crucial to remain cognizant of potential challenges and consider a more comprehensive examination of diverse perspectives and ethical implications in subsequent research phases.

1.6. Opportunity Identification

The literature review underscores the critical need for HR focused innovation amidst growing talent acquisition and retention challenges. AI, particularly via LLMs and chatbots, is poised to revolutionize HRM (human resource management) by analyzing complex qualitative data. The 2023 Microsoft Report already spotlights AI as a key to enhancing organizational productivity and addressing wider societal issues, such as diversity and inclusion, thereby marking a

proactive shift in workforce management. (AI Microsoft 2023) By focusing on opportunities to create an inclusive work climate, where every individual feels valued, underscores the potential for positive societal impact and targets current productivity disrupters from a different angle. This part on opportunity identification marks a crucial step beyond identifying problems, offering a new direction towards a transformative approach to contemporary workforce challenges.

1.6.1. Opportunities and Impact in Organizational Dynamics

The current landscape of employee behavior, when viewed in the literature review through corporate culture, retention, and job satisfaction, presents mounting challenges for managers in talent acquisition and retention. Employee retention emerges as a crucial economic concern, with resignations entailing substantial costs in recruitment and training, leading to a dip in overall organizational productivity. (Gorde 2019)

Moreover, job satisfaction profoundly influences life satisfaction, indicating a bidirectional relationship where workplace and societal issues intersect (Rain 1991). Which in turn can mean that organizational problems can become societal problems and vice versa. The pandemic's upheaval has amplified global labor shortages, necessitating again a strategic refocus on enhancing employee experiences to maintain stability and adaptability. (Javaid 2023) Organizations must, therefore, evolve their structures and processes to address these emergent challenges effectively. The Microsoft Report advocates for harnessing employee insights to pinpoint and tackle productivity disruptors (AI Microsoft 2023). Establishing robust engagement and communication channels between employees and management can support this action and is crucial for bolstering retention (Gorde 2019).

The integration of AI in HRM can support in offering a pathway for sustainable impact on economic productivity, employee retention, and societal well-being. AI applications, particularly through LLMs in chatbots, have demonstrated potential in reducing turnover rates by enhancing the employee-organization relationship. (Malik 2020) These technologies also facilitate the transition of HR roles towards more strategic and innovative functions, paving the way for new market opportunities and the reshaping of work (Guenole 2021). It has been repeatedly stated that new technologies for HR procedures will help HR professionals use their expertise more efficiently and enable a more intimate working relationship with the workforce (Lindsay 2014).

This research highlights opportunities in improving knowledge exchange between employees and employers through AI-mediated HRM practices. A strong knowledge exchange is expected to enhance job satisfaction, leading to improved employee retention and a positive company culture. The study also underscores the potential benefits of implementing innovative activities in organizations, with a proven positive correlation between innovation and firm performance. (R. Lee 2014) These identified opportunities offer avenues for enhancing organizational dynamics and addressing potential challenges.

1.6.2. Opportunities for Diversity Practices and Impact on Societal Challenges

In the realm of HR, the transition from merely identifying business opportunities to harnessing impact opportunities is paramount, especially when considering the societal implications of diversity and inclusion practices. The consensus among industry experts underscores the importance of fostering a workplace where every employee, irrespective of their background, feels intrinsically valued and included (Adams 2019).

Globalization and the knowledge economy have rendered the embrace of workforce diversity and inclusion not just ethical imperatives but essential ingredients for organizational success. It is the diverse workplace where minority voices are not merely heard but are respected, appreciated, and valued, that becomes a crucible for collective intelligence and innovation. (Okoro 2012) Indeed, evidence suggests that such a workforce positively influences employee attitudes and engagement, laying the foundation for a robust corporate culture (Dutta 2022).

Yet, a gap persists in the availability of tools and processes that can create climates of inclusivity—a workplace where acceptance is universal, and exclusion is nonexistent. Achieving this climate is no additional task but a prerequisite for leveraging the full spectrum of workforce diversity. (Adams 2019) The journey to cultivating and sustaining such an environment demands relentless commitment to not just assembling a diverse team but ensuring active participation and genuine acknowledgment of each member's contribution (Dehaze 2018).

Effective communication is the bedrock of this inclusive environment, fostering a workplace where every employee is confident that their voice carries weight and their perspective matters. Persistent and thoughtful communication is the lifeblood of an inclusive workplace, vital for exceptional performance, productivity, and retention. (Okoro 2012)

It is crucial to recognize that fostering inclusion transcends the mere elimination of discrimination. Inclusion is intrinsically tied to well-being, more so than the absence of discrimination. Organizations must, therefore, intentionally cultivate behaviors that reflect authentic, respectful, and inclusive leadership—behaviors that ensure every individual feels heard and respected. Such an approach is poised to enhance performance, organizational commitment, and the realization of strategic goals through the elevation of employee well-

being. (Adams 2019) Furthermore, employees who perceive their workplace as inclusive and purposeful not only exhibit increased productivity but also demonstrate greater health and resilience—reaffirming the extensive societal impact of employee well-being (Dixon-Fyle 2020).

1.6.3. Innovation Opportunities

Organizations exist in a state of continuous competition. In a typical market, various providers vie for market shares and customers. The structure of the market determines the dynamics. Growth markets, for example, allow a focus on extensive new customer acquisition to capture the market, while shrinking markets typically result in intensified competition for existing customers. Companies must adapt their organizational structure and strategy to such market dynamics. (McGee 2015) A crucial component of competitiveness in nearly all markets is a company's speed of innovation. New companies regularly enter almost every market with innovative approaches and products, so it is essential for existing players to differentiate themselves from these challengers by constantly innovating their products to defend their market shares. (Reguia 2014)

But how does a large organization maintain a high speed of innovation? This challenge is particularly acute for large corporations whose organizational structure systematically slows down innovation. Slow decision-making processes, complex budget allocations, and varying stakeholder interests are common negative influences on a company's ability to innovate. (Granstrand and Sjölander 1990) Google, as part of the Alphabet conglomerate and one of the highest-grossing companies in the world, is often cited in literature as an outstanding example of successful innovation culture. The company credits its success largely to its culture and the innovations of its employees.

‘*The most valuable result of 20 percent time isn’t the products and features that get created, it’s the things that people learn when they try something new.*‘ *(*Eric Schmidt, Chairman of the Board at Alphabet Inc.)

Google's 20% rule refers to the practice of allowing employees to spend 20% of their time on different projects within the company. Within this framework, any employee can work on any project they choose – the only condition is that if you need support from other employees, you must convince them yourself; no matter how good the idea is, you will never be assigned anyone automatically. This approach has spawned various products that now contribute a significant portion to Alphabet's revenue, such as Gmail or Google News. (Schmidt 2014)

While this approach cannot be easily adopted by every company, it is underpinned by a deeply ingrained corporate culture that places the employee and their ideas at the forefront. Nevertheless, Google demonstrates with this approach the innovation potential within the company and how effectively leveraging this can contribute to business success. In addition to the direct economic impact, the freedom for employees to pursue other projects also has a significantly positive effect on employee satisfaction, which in turn substantially reduces the resignation rate. (Schmidt 2014)

Similar examples can be found in companies of almost any size. In conclusion, it can be stated that the utilization of employee ideas can be a driver of innovation and thus competitiveness of a company, potentially having a direct positive economic impact.

1.6.4. Opportunities for Efficiency and Effectiveness

‘*The world’s most valuable resource is no longer oil, but data.*‘ This quote from The Economist epitomizes a new understanding of the relevance of data in the economy. Some of the world's

largest corporations, such as Meta and Alphabet, base their business models on the massive collection and sale of data. (Angwin 2010) The systematic collection and analysis of data now constitute a fundamental part of decision-making in most companies. With an increasing volume of better-quality data, shipping routes can be planned more efficiently, the purchasing and returns of fashion companies can be better managed, or machine maintenance can be optimized. Data are collected and utilized in all sectors of the economy to enhance efficiency and effectiveness within companies. (Provost and Fawcett 2013) However, this often pertains to processes that are heavily related to the product or production, like the optimizations of purchasing or transport routes mentioned earlier. Internal structures and workflows are less frequently represented and analysed. (Provost and Fawcett 2013)

Herein lies a significant opportunity through the systematic collection of employee data. Cross-departmental processes, in particular, tend to carry the risk of becoming bloated and sub-optimally executed over time. A comprehensive understanding of the challenges in the daily work of employees can help identify deficits in processes and implement corresponding optimizations. Such data enable better company management and a faster response to issues. (Gröger, Schwarz und Mitschang 2014) The greatest challenge so far has been the structured collection and utilization of these data. Since they are highly individualized and thus not quantifiable, their analysis requires a significant resource investment. Additionally, the impacts are often not directly measurable in monetary terms, unlike savings from optimized routing or revenue increases from an adjusted online store presentation. This combination of the impacts' lack of quantifiability and the need for significant resources to analyze such data means that many companies fail to capitalize on the potential to increase efficiency in internal processes. (Gröger; Schwarz and Mitschang 2014)

However, the technological developments related to LLMs, as mentioned in Section 2.3, at least resolve the challenge of resource allocation, thereby creating a new opportunity for companies to optimize the use of internal data.

1.7. Conclusion

As we synthesize the insights from the preceding analysis, it is evident that for organizations to thrive in a landscape marked by rapid change and diverse workforces, the adoption of AI in HRM is not just innovative—it's essential. These advanced tools are instrumental in addressing the multifaceted challenges of managing diversity and inclusion, enhancing employee experiences, and fostering a culture of sustained innovation.

The journey toward integrating AI within HRM is one marked by the potential for profound organizational and societal benefits. It paves the way for a deeper comprehension of internal dynamics and ushers in efficiency and innovation, thereby influencing business success enduringly. Opportunities emerge as organizations actively engage with AI, recalibrating their approach to HR practices, and committing to the creation of inclusive and vibrant workplaces.

In anticipation of empirical research, the literature has laid a robust foundation for exploring and understanding the nuanced interplay between employee satisfaction and HR practices. This empirical phase aims to further decode the state-of-the-art in HRM with LLMs and to refine our solution by mitigating associated risks. The literature underscores the reciprocal impact of HR issues on both employees and employers, shaping the research focus towards solutions that bridge the divide between these groups. This targeted approach has yielded two guiding hypotheses, one for each stakeholder group, steering our inquiry towards an impactful resolution.

Group Part (Eric Jean Ferreira, Konrad Gruner, Christian Max Heinreich Nagel)

2. Empirical Research

2.1. Research Background

Before this thesis, the inception of a chatbot tailored to identify sentiments and provide guidance on well-being was borne from a project to develop a mood-tracking diary application within the university setting. Early dialogues on this venture brought to light the intricate regulatory web that such an undertaking would entail. This insight necessitated a strategic shift, sparking the pursuit of a feasible solution that promised tangible benefits. The emergent hypothesis posited that such a tool could potentially bolster employee satisfaction.

This hypothesis set in motion a series of comprehensive (yet non-scientific) interviews which honed the initial concept and signaled the onset of a more systematic and methodical research phase. The prelude to our empirical investigation, termed the 'pre-work' stage, initiated even before we embarked on the literature review and defined the overarching problem statement. The aim was to sketch a preliminary outline of the challenges and opportunities inherent to our proposition, indirectly steering the course for our ensuing research endeavors.

Embracing the scientific rigor of 'Phase 1', we already gained valuable insights from the initial literature review, enabling the articulation of a problem statement. This phase sought to verify the existence of a tangible problem or need within the domain, setting the stage for a potential solution. Concurrently, this process also served to validate the identified issues, thus laying a robust foundation for this thesis.

Despite the fruitful exchanges during the pre-research dialogues, the advent of the actual thesis work was marked by a plateau in novel knowledge acquisition. Both the undertaking of a survey with employees and the problem interviews with decision makers continued until there was no observable value-add. After gaining these insights, we moved on to ‘Phase 2,’ where we again surveyed decision makers to close any knowledge gaps that had arisen from ‘Phase 1’ insights. This phase also focused more specifically on requirements for product development.

In synthesis, this Chapter is a prologue to the dual-faceted nature of our research journey, unveiling the theoretical framework and the empirical undertakings that culminate in the proposal of the solution: *Thrivio*. This Chapter not only elucidates the rationale behind the strategic pivot from our original mental health chatbot concept but also charts the course for the forthcoming exploration into the tool's potential to elevate workplace satisfaction. The subsequent section will expand upon the research methodology and the evolution of the concept, underpinned by a graphic overview encapsulating the entire empirical research scope including the foundational pre-research phase. (Figure 1) (AI Microsoft 2023)

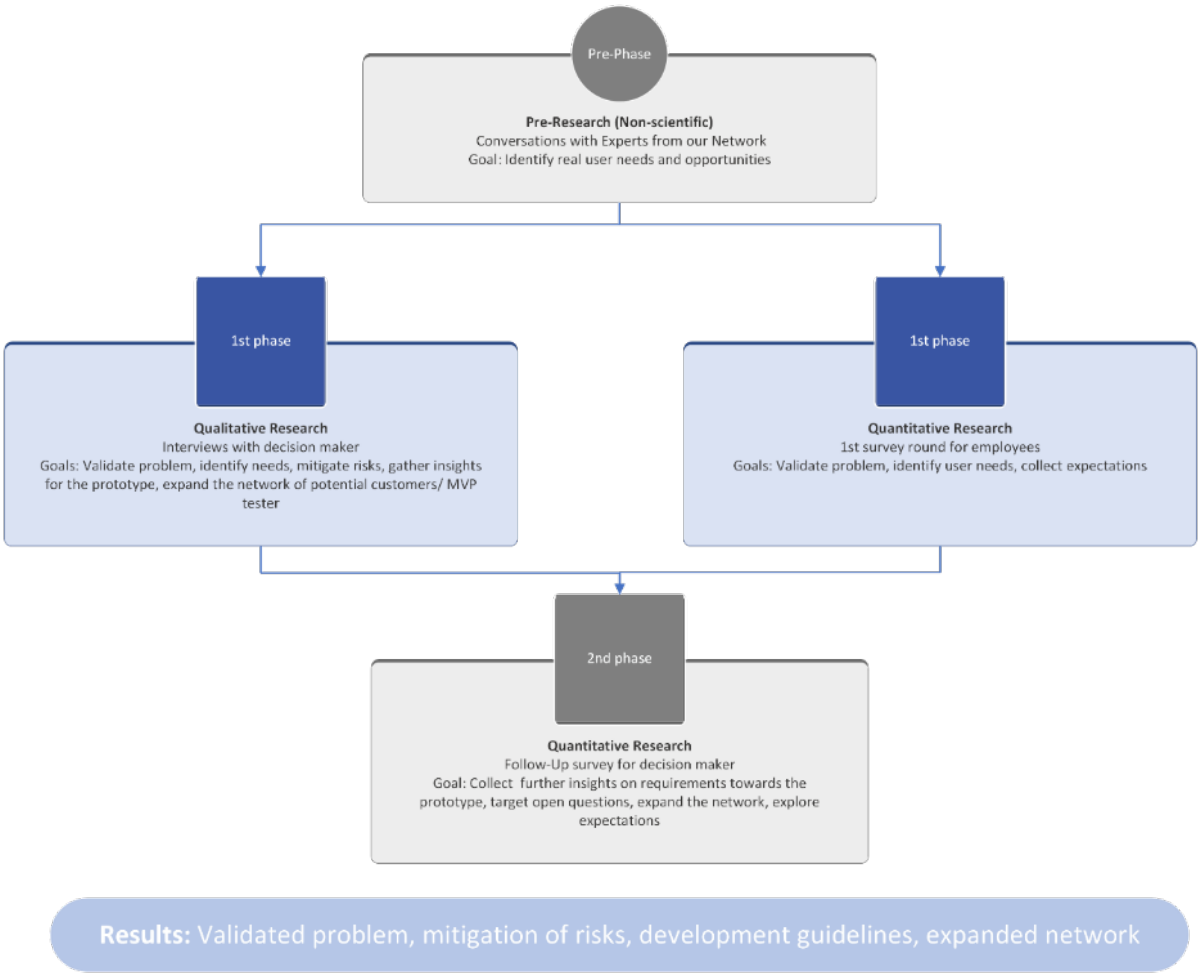

Figure 1: Empirical Research Structure

2.2. Research Methodology

The primary research for this project is designed to mitigate risks associated with the final product. This involves validating the perceived problems from the perspectives of key stakeholders, understanding the needs and desires of employees and decision-makers, and refining the prototype accordingly. The research also seeks to affirm product development stages by interviewing industry professionals in AI-mediated processes or new technology development. These experts, while not direct users or customers, offer invaluable insights for risk mitigation in product development.

Given the complexity of product development in today's world, a single-method research strategy would be insufficient. Hence, a mixed-methods approach, integrating both qualitative and quantitative data collection and analysis, was adopted. This approach is essential because it provides a comprehensive understanding that neither methodology could offer alone (Pole 2007). Mixed methods research, particularly when studying employee satisfaction and AI in HR practices, allows for a nuanced understanding of the distinct yet interconnected groups of employees and decision makers (Ivankova 2009).

Our mixed methods approach includes qualitative interviews and two quantitative surveys. The interviews aim to delve into the aspirations and opinions of decision makers and to extract feedback from industry professionals on developing new technology-focused processes. The quantitative surveys are designed to collect insights from employees and investigate decision-makers' sentiments beyond the previous interviews.

Data from each method will be analyzed using techniques suited to the respective data types. Qualitative data from interviews will undergo content analysis as per Mayring's method, while quantitative survey data will be subjected to appropriate statistical techniques based on the data's distribution. (Sandelowski 2000) This dual analysis will ensure that findings from one method validate and lay the groundwork for the other, providing a holistic view of the research question (Pole 2007).

Two hypotheses guide the first research phase, the first one for the quantitative and the second one for the qualitative strand:

1. Employees are expected to highlight deficiencies in current feedback mechanisms through surveys, indicating areas for enhancement.
2. Decision-makers are anticipated to identify shortcomings in existing feedback systems through interviews, suggesting avenues for improvement.

In sum, a mixed-methods approach over approximately three weeks conducted the primary research. Semi-structured interviews and self-administered surveys investigated the feedback process and the proposed solution's usability, feasibility, and added value. This cross-sectional strategy aims to gather extensive data within a limited timeframe to provide an interconnected perspective of both the employer and employee views, as well as the technical and entrepreneurial aspects of the project.

2.3. Qualitative Research

This thesis's empirical section utilizes qualitative interviews to understand the specific challenges and needs faced by growth-oriented start-ups and SMEs (small to medium enterprises) during the feedback evaluation process. This study is dedicated to confirming the identified issues and assessing the potential of the proposed solution within the target customer demographic, extending into entrepreneurial and technical opportunities. For in-depth analysis, Mayring's content analysis methodology is employed, offering granular insights by deconstructing the fundamental material into a validated summary. This condensation is crafted through a systematic technique, contingent on pinpointing key thematic categories consistent throughout the research database. (Mayring 1994)

2.3.1. Interview Structure

Embarking this structured qualitative research journey, our focus lies on decision makers in SMEs, utilizing Mayring's coding for a nuanced exploration of problem validation, needs assessment, and expectations for the prototype. This period of exploration is essential for an in-depth understanding of the problem, which will then allow us to identify suitable solutions. (Dorst 2001) Precisely, the target group of this study consisted of decision makers of SMEs, as this specific group has a significant influence on the feedback process, subsequent tool use, and the implications of collected data. The interview script was meticulously designed beforehand with specific intents behind each question. The full interview script can be found in Appendix 10.

2.3.1. Analysis of Interviews to Validate Challenges in SME

This Chapter presents an analysis of qualitative interviews conducted with various organizations using Mayring's qualitative content analysis method. The analysis revolves around five thematic units: Organizational Dynamics and Employee Well-being, Feedback Processing and Decision-making, Innovation Adoption and AI Integration, Evaluation Metrics and Strategic Alignment, and Impact Assessment and Future Outlook. These interviews were primarily relevant for analyzing the challenges companies face in collecting and utilizing qualitative feedback and validating them for the selection of fundamental features for the MVP. Therefore, this Chapter succinctly summarizes the core statements. The complete transcripts can be found in Appendix. 11.

Organizational Dynamics and Employee Well-being: The adaptability of organizations to employee needs, especially in hybrid environments, is crucial for maintaining a dynamic workplace. 5AM Agency emphasizes this through a strong company culture and initiatives like

regular meetings, impacting employee retention positively. "Creating a strong company culture is key," says Ole Besendahl (Besendahl 2023, 3), highlighting the importance of direct communication in ensuring well-being. (Besendahl 2023)

Feedback Processing and Decision-making: Feedback mechanisms in SMEs often rely on direct communication channels, as highlighted by BGA's approach to employee feedback. However, challenges in interpreting feedback without structured processes are common. Eduardo Mendes from BGA notes, "Interpreting feedback is challenging," (Mendes 2023, 2) underlining the need for effective feedback mechanisms in decision-making. (Mendes 2023)

Innovation Adoption and AI Integration: The readiness to adopt AI varies, with integration challenges being a significant concern. For instance, 5AM Agency's openness to AI is tempered by concerns over its integration with tools like Slack (Besendahl 2023). "AI should enhance, not replace, direct communication," suggests Henry-Yves Coco (Coco 2023) from Rameder, pointing to the need for AI to fit within the organizational culture.

Evaluation Metrics and Strategic Alignment: Metrics such as employee satisfaction are pivotal. Rameder uses employee satisfaction as a key indicator, aligning AI tools' strategic value with deeper feedback insights (Coco 2023). "AI can provide deeper insights into feedback," echoes Maija from Slush (Muntila 2023, 3), highlighting the strategic importance of AI in feedback analysis. (Muntila 2023)

Impact Assessment and Future Outlook: The potential impact of AI tools on organizational efficiency and employee engagement is significant. "AI tools could improve operational efficiency," notes Besendahl (Besendahl 2023, 3), while Slush anticipates AI enhancing employee engagement (Muntila 2023). The scalability and adaptability of these tools are essential for long-term success, as per the insights from Rameder (Coco 2023).

The interviews reveal a diverse landscape in how organizations approach employee well-being, feedback processing, and the adoption of new technologies like AI. While there's a clear recognition of the value of feedback in organizational dynamics, the methods of collecting and interpreting this feedback vary widely. The readiness for AI integration and its alignment with organizational culture and strategy are areas with mixed responses, suggesting a cautious yet curious attitude towards technological innovations. The analysis underscores the need for adaptable, culturally aligned tools that can seamlessly integrate into existing systems while enhancing employee engagement and decision-making processes.

This qualitative analysis using Mayring's methodology provided valuable insights into the current state and future potential of employee-focused strategies and technological integration within organizations. The findings from these interviews offered a nuanced understanding of the challenges and opportunities in enhancing organizational dynamics and decision-making processes, emphasizing the importance of aligning technological solutions with strategic goals and cultural values for sustainable growth and development.

2.3.2. Analysis of Interviews Assessing the Tech-Stack

As previously mentioned, we additionally managed to land some interviews with NLP experts and a founder of *Ora.ai*, a platform to ‘code’ your own chatbots just by simple prompts. To not overcomplicate and adhere to the thesis scope, the following part will very briefly state key findings from these interviews that have shaped the project’s development and business scope without coding as per Mayring. However, each transcript can be found in Appendix 10.

From the tech interviews with NLP experts Tameesh and Sanny, we derived essential insights into the development of AI-enhanced feedback systems. They emphasized the criticality of mitigating bias in NLP models, advocating for thorough parameter experimentation and the

strategic use of pre-existing models like OpenAI for practical scalability. A significant focus was also placed on the transformation of unstructured feedback into structured formats to facilitate deeper analysis. The challenges surrounding data privacy and nuanced sentiment analysis were also highlighted, underscoring the complexities involved in handling sensitive organizational feedback.

In contrast, the interview with Dennis, the founder of *Ora.ai*, provided a unique perspective that blended business strategy with technical acumen in the context of AI platforms. Dennis shared his experiences on pivoting product focus, illustrating the importance of a robust system architecture and the challenges faced in scaling and managing data efficiently for chatbot applications. He stressed the significance of quantifying qualitative data and the necessity of an iterative development approach. This approach prioritizes constant user engagement and feedback, advocating for starting with simple, user-centric designs to validate core features rapidly – an aspect that will be picked up on later in the scope of the thesis.

These insights collectively offer a brief, but comprehensive understanding of the current state and challenges in implementing AI tools for feedback analysis in growth startups and SMEs. They provide valuable guidance in our efforts to develop an efficient, user-centric, and scalable AI-enhanced feedback evaluation platform and the feasibility of its' potential features.

2.4. Quantitative Research

In transitioning from the decision-maker's perspective to that of the employees, our quantitative research phase is crucial. This phase aims to substantiate the identified problems and gauge the genuine necessity for solutions from the end-user's vantage point. Primary data collection through a self-administered online survey will enrich our understanding and refine product development. This method is chosen for its accessibility and cost-effectiveness. (Sierles 2003)

The survey will not only bolster secondary data but also highlight new facets, guiding the initial solution build to align with the end-users' values and usage preferences, thereby enhancing the potential for a successful product.

2.4.1. Survey Process

In addressing time constraints, this thesis adopts a quantitative, cross-sectional survey targeting employees across various industries, save for the secondary and tertiary sectors. This approach, leveraging existing networks, primarily garners participation from Germans, reflecting a potential national bias acknowledged as a limitation but also as a strategic fit for the venture's initial focus on Germany. (Volkmann 2009) The survey, available in Appendix 1, aims to evaluate workplace feedback systems, identify system gaps, gauge interest in new features, understand employee feedback engagement, and assess anonymity's role in feedback provision. Adhering to ethical research standards, we maintain participant confidentiality and informed consent (Kelley 2003). The survey's design is straightforward, balancing various question types to ensure clarity and purpose-driven data collection. There is a chance of occurring sampling errors, like a selection bias (higher risk) (Hernán 2004), non-response bias (medium risk) (Berg 2010), and social desirability bias (lower risk) (Larson 2018). Aware of these potential sampling biases, measures were taken to mitigate them. Essentially, there are five main intents or goals of this survey:

1. Assessing the status quo of feedback systems at workplaces
2. Identifying gaps in current systems
3. Assessing feature interests in a new system
4. Understanding how employees engage in providing feedback
5. Evaluating the importance of anonymity and comfort level in providing feedback

2.4.2. Survey Analysis

With the 100 responses gathered in a timespan of about a week, a thorough analysis was conducted filtering by respondents who were neither unemployed nor self-employed as only these are relevant to the problem of lacking employee feedback mechanisms. In addition, the data was further pre-processed in 3 steps to allow for better and more precise analysis:

1. Changed column names for more precise ones
2. Filled missing values
3. Deleted empty or irrelevant columns

With the in-text analysis, we hope to cover the most important aspects like providing a statistical summary of key variables, creating visual representations of key variables, investigating how demographic variables relate to feedback mechanisms and preferences, and conducting hypothesis tests to validate our assumptions. The full analysis can be found in Appendix 7.

Our sample is evenly split between males (51%) and females (49%), though they are rather young with the majority being 25-34 years old (65%). As expected, 91% of the respondents are from Germany, which aligns with our target market and most of the respondents (48%) work in companies with 500+ employees. Furthermore, the demographic data has been checked for correlations with feedback-related variables such as the needed frequency of providing feedback or comfortability, but none of the demographic variables have proven to be a good predictor of feedback-related variables due to very weak correlations.

67% of respondents reported that their workplace uses structured approaches with the most popular mechanisms being one-on-one meetings (48 mentions), open-door policies (45 mentions), and pre-defined surveys (37 mentions). This data proves that the most used

mechanisms, if not collected by quantitative surveys, heavily involve human work and are therefore extremely time-consuming for both parties. Moreover, the mean satisfaction level of the current mechanisms is at a rather neutral 6.29 out of 10. Satisfaction levels correlate negatively (-0.38) with the need to provide feedback suggesting that those who feel the need to provide feedback more frequently are generally less satisfied. A strong positive correlation (0.58) between comfortability and satisfaction indicates that those who are more comfortable providing feedback are generally more satisfied. These findings reinforce the opportunity to provide an approach that is more tailored to employees' needs, and more automized in providing quantified insights on qualitative data.

As for feature preferences, the data shows that most respondents stated, ‘It depends’ (45%) or ‘Yes’ (43%) when asked about the preference to give feedback anonymously. This shows that most people have topics they do not wish to discuss in person, if at all. This also shows in the most valued features of the respondents, as the most valued feature is ‘voicing concerns with enhanced anonymity’ (26 mentions). A graph indicating all feature preferences of the sample can be found in Appendix 8. The data also suggests a high level of acceptance for integration of an AI enhanced feedback tool (76.81%) while chatbot acceptance is mostly answered with a ‘Maybe’ (38%). Another interesting insight is that the frequency with which employees feel the need to provide feedback is very spread out but correlates negatively (-0.37) with comfort level suggesting that the frequency of feeling the need to provide feedback decreases when comfort levels rise.

Our hypothesis testing, conducted using non-parametric methods due to the non-normal distribution of data (Vickers, 2005, p.1), included the Mann-Whitney U Test and Spearman’s Rank-Order Correlation. The following four hypotheses were tested:

2.4.2.1. Anonymity Preference vs. Comfort Level

- **Null Hypothesis (H0):** There is no relationship between the preference for anonymity and comfort level in providing feedback.
- **Alternative Hypothesis (H1):** There is a significant relationship between the preference for anonymity and comfort level in providing feedback.
- **Test Method:** Mann-Whitney U Test
- **p-value:** $4.88 * 10^{-22}$
- **Significant:** True
- **Interpretation and Implications:** The data strongly rejects the null hypothesis, indicating a significant relationship between the preference for anonymity and comfort level. This suggests that any product design should prioritize features that allow for anonymous feedback to enhance user comfort.

2.4.2.2. Satisfaction vs. Action, Engagement Frequency

- **Null Hypothesis (H0):** There is no relationship between satisfaction levels and the frequency of providing feedback.
- **Alternative Hypothesis (H1):** There is a significant relationship between satisfaction levels and the frequency of providing feedback.
- **Test Method:** Spearman's Rank-Order Correlation
- **Correlation Coefficient:** -0.378
- **p-value:** 0.0014
- **Significant:** True
- **Interpretation and Implications:** The null hypothesis is rejected, revealing a negative correlation between satisfaction levels and engagement frequency. Lower satisfaction

leads to higher engagement in providing feedback. This underlines the need for a platform that can efficiently handle frequent feedback, especially from less satisfied users.

2.4.2.3. Chatbot Acceptance vs. Age Group

- **Null Hypothesis (H0)**: Age does not influence the willingness to use a chatbot-based feedback platform.
- **Alternative Hypothesis (H1)**: Age significantly influences the willingness to use a chatbot-based feedback platform.
- **Test Method**: Spearman's Rank-Order Correlation
- **Correlation Coefficient**: 0.090
- **p-value**: 0.464
- **Significant**: False

2.4.2.4. Employees in Bigger Companies Expressing Dissatisfaction

- **Null Hypothesis (H0)**: Company size does not influence employee satisfaction with existing feedback methods.
- **Alternative Hypothesis (H1)**: Company size significantly influences employee satisfaction with existing feedback methods.
- **Test Method**: Mann-Whitney U Test
- **p-value**: $2.74 * 10^{-16}$
- **Significant**: True
- **Interpretation and Implications**: The null hypothesis is strongly rejected, suggesting that employees in larger companies are more often dissatisfied with existing feedback

methods. This highlights the need for a scalable feedback platform that can cater to larger organizations.

2.4.2.5. Conclusion

In summary, our primary data collection, while subject to potential bias risks and inherent limitations of surveys, reinforces the initial hypothesis of a market gap in bottom-up feedback tools at workplaces. Existing mechanisms are either time-consuming, subject to human bias, or overlook qualitative data by relying on predefined surveys, thus failing to address employee needs adequately. As Henry-Yves aptly summarized in our interviews, ‘I rather go for the results from the employees, and the questions from the employees, and the pain points from the employees than getting standard answers to my questions.’ (Coco 2023, 3). Demographics do not reliably predict feature preferences, but anonymity in voicing concerns is a primary feature interest. Integration is key to feedback tool acceptance, while the viability of chatbot usage requires real-world validation. Our findings reveal that lower satisfaction increases feedback engagement and that employees in larger companies tend to be more dissatisfied, suggesting a heightened need for such a platform in bigger corporations. This data will guide our solution proposal, product design process, and feature prioritization. The subsequent Chapter will introduce a solution proposal addressing the identified issues, based on insights generated from the primary and secondary research.

3. Product Development

After thoroughly reviewing literature, consolidating of primary as well as secondary data, and the subsequent derivation of a solution proposal, the following Chapter will delve into the development of the first tangible product. The technology selection for development will be determined and justified and in-depth development descriptions of the backend and frontend components of the product will be given. Additionally, underlying limitations and missing technologies will be discussed. As a result of this Chapter the first operational product – *Thrivio's* MVP 1.0 – will be presented.

3.1. Technology

In the following Chapter, our technology selection will be discussed, evaluated, and justified on the background of constraints and requirements of the platform development process. First, the constraints we are limited by throughout the thesis project will be discussed and subsequent requirements formulated. As a result, the methodology of our development approach as well as the chosen development tool will be explained and justified. This Chapter serves as the foundation on which the development description will be built.

3.1.1. Constraints and Requirements

Considering the limited expertise for software development in our team and the inherent fast-paced nature of the thesis, it was only logical to design a first pilot product comprising the most essential and value-delivering parts of the envisioned solution. In the end, our requirement of the process is to gain insights and validate assumptions in a very limited timespan and scarce resources. The MVP developed throughout the three-month thesis sprint will enable us to

collect first-hand feedback from our defined target users with limited expertise and development effort.

Furthermore, without early-stage investment from outside our team, we are very limited in available resources for the development of our product to validate the to-be-delivered value and product market fit. Building a heavily stripped-down product comprising only of core features allows us to allocate resources effectively. Additionally, choosing such an MVP development approach allows us to reallocate our bootstrapped resources quickly and efficiently should the development process run into limitations or should our initial test findings suggest a pivot to other features. Essentially, it allows for low-risk, high-reward outcomes, and increased flexibility in first-stage development. With the goal in mind to turn this into a sustainable business, all these resource savings can eventually be used to build a full-scale product with the value of the solution validated in the scope of the thesis.

Lastly, it is especially important for us to prove the value added of the solution in a real-world setting. By putting our users at the center of the development process and being able to adapt to their needs, we can increase the value add for businesses using our solution and prove traction in real-world settings.

3.1.2. The Concept & Application of Rapid Application Development

Now that the constraints and requirements of this project have been stated, the next crucial thing is to define the methodology with which we will make sure to fulfil the requirements and adhere to the constraints. To do this we have chosen to go with a rather practical and agile approach for simplicity due to lacking expertise in the development stage. Instead of going for a very structured and meticulously planned approach like the waterfall method, we chose to go with the Rapid Application Development (RAD) approach.

In a nutshell, RAD is ‘a software development methodology that prioritizes rapid prototyping and quick feedback over long-drawn-out development and testing cycles’ (Kissflow 2023). Overall, it is an iterative and incremental approach that focuses on rapid delivery and mitigating risks throughout the project (Zafar 2018). Its benefits like faster time to market, cost & time savings, increased value generation, reduced risk, and enhanced customer satisfaction through close collaboration (Microsoft Power Apps n.d.) essentially mirror the requirements and constraints discussed in the previous Chapter. Therefore, it is a perfect fit for our rather low expertise in the development planning field and is highly suitable to maximize insights with minimal investment.

Essentially, this thesis will cover the first cycle of the RAD method from defining the requirements to prototyping and construction to the final stage of deployment for our pilot users to test. In the earlier Chapters of this thesis, the problem has been stated and validated through both existing literature and our own empirical research with potential users of the application. Consequently, a solution was proposed out of which feature requirements will be deducted in the following Chapter from which a first prototype can be built. With an established idea of the initial MVP build, we can then move forward with the development process, debugging, and a first test cycle to verify, adapt, and potentially reimagine the initial features.

3.1.3. Developing as an average Joe – Why OutSystems?

Although we have now chosen a methodology based on the constraints and requirements, we still need to choose a tool that will let us quickly and efficiently develop full stack without having to become a software engineer in three months. To do this, we set our eyes on low-code solutions to be able to build the best MVP we could while incorporating the limited coding

knowledge we had as best as possible. In the end, our pick was OutSystems as our full-stack development platform.

OutSystems is a high-performance low code solution enabling full-stack development through one platform. It allows for efficient cooperative development that can scale to a large number of users with minimal delivery time up to 4 times faster than the competition. Through its modular infrastructure, it enables the developer to make and deploy changes very efficiently in cooperation with others. It comes with pre-built AI/ML models and the addition of user-created components in the 'Forge' to incorporate building blocks (modules) the community created (OutSystems n.d.). Additionally, we are offered a free development and production environment through NOVA Sbe to build the first MVP iterations which enables us to bootstrap the project for now.

While OutSystems is a great fit for the current stage of the project, we are aware of the various downsides and limitations it forces us to abide by in the present and the future. Although it offers a wide variety of integrations and a high degree of customization for a low-code solution, it is focused on high-level development and can therefore limit the customization that is possible. In other words: Writing your own code will always be superior when trying to subject yourself to the highest market standards. Although a growing community (Business Wire 2023) OutSystems is nowhere near the engagement standards of other communities like Python or Java (Google Trends n.d.). Therefore, even though designed for easy access and fast mastery, OutSystems does have a non-negligible learning curve when trying to master the little nuances that will separate a good application from a mediocre one. Although it is designed to be scalable, OutSystems can present challenges when it comes to ultra-high-scale applications, both from a technical and financial perspective. We know that building what we envision will change the way businesses listen to their workforce cannot be sustained solely in OutSystems. This is a

first step and OutSystems is the perfect fit for that first step. Subsequently, we need to brace for eventual high subscription costs or high migration costs when turning this vision into reality by adopting market standards and hiring real software engineers.

On the background of these critical insights, we first started developing in Softr (Softr n.d.) with the help of Airtable (Airtable n.d.) but quickly realized the immense limitations of both tools would not let us build the solution we envisioned. As we looked into other comparable solutions like Appian (Appian n.d.) or Power Apps (Microsoft Power Apps n.d.) it became clear that OutSystems was our best pick out of all of these due to the fact that we would be able to gain expertise through our advisor Hugo and have cost reductions due to the opportunity provided by Nova SBE. Our pre-thesis efforts up until this point are shown in Appendix 2.

3.2. Frontend Development

Subjected to the identified problem, its implications for our user's needs, and the proposed value to be delivered by the platform, it was critical to design a frontend that would meet all of these subjections and deliver an experience that is intuitive and pleasurable to the user. While backend development is responsible for the logic behind a webpage or web application, frontend development is the process of creating the user interface of a webpage or web application using programming languages such as HTML, CSS, and JavaScript (Gallinelli 2021; Berkeley Extension n.d.; Frontend Masters n.d.). In combination with the backend, the frontend's main goal is to create a visual representation of the application's logic that is easy to navigate, intuitive, fitting to the application's features (Frontend Masters n.d.), and responsive to the user's device (Lemonaki 2022). In our case, we again will use OutSytems as a full-stack tool to design the frontend to adhere to the aforementioned constraints and limitations our team operates under. This will essentially mimic programming in HTML, JavaScript and CSS styles.

Although often used interchangeably, user experience (UX) and user interface (UI) are two separate fields both equally important to the development process (Gottdiener 2022). This Chapter will describe both the UX, and the UI development from the identification of our user's needs to the actual development process inside OutSystems to show the finished MVP's front end.

3.2.1. User Experience Design

As a first step in the frontend development of a solution, designing an UX that delivers meaningful and relevant experiences to users is crucial (Interaction Design Foundation (a) 2016). It entails the creation of a solution that is easy, efficient, and relevant in the experience to the user (Stevens 2023). To achieve a great UX design it is vital to understand user's needs and challenges of the status quo on the background of the current state of the art (SOTA) solutions of the market. Through the conducted primary and secondary research touched on in previous Chapters these needs and challenges became evident.

Employees proved to feel rather neutral toward the current feedback collection processes in place while expressing that their individual needs at the point in time they arise are often neglected. They stated a preference for anonymity when expressing their emotions and feedback which his reinforced by the fact that comfortable employees voice their opinions more often. A fact that reinstates the current data monopoly held by those comfortable giving feedback. Moreover, employees want more personalized recommendations while having a larger voice in the organization in combination with instant acknowledgement and information on what feedback is being worked on.

Employers, or managers, see employee retention and engagement as critical for their business success. As a driving force for ensuring the retention and engagement they see potential in

bottom-up feedback processes. They expressed their interest to go beyond static processes with pre-defined surveys that don't touch on the specific employee needs or go beyond time-intensive 1-on-1 meetings which are conducted often too rarely. Spending time analyzing qualitative data cannot and will not be done in practice. Paradoxically managers expressed huge interest in understanding how their organization feels down to the department, specific roles, and topics. The value lies in the granularity of the data. However, all of this is seen as an addition to the work they do on the daily which is reinforced by the findings of the literature research. The solution cannot and should not replace the interpersonal work at organizations nor should it replace the implementation of solutions.

3.2.1.1. User Stories

Translating from these garnered theoretical and empirical insights user stories were derived to inform the feature list potential users would derive value from. User stories are a commonly used, and effective tool in web development to think about the UX design from each user's perspective (Interaction Design Foundation (b) 2016; Suresh 2023). The user stories per frontend section shown in Table 1 with respective intent relating to the proposed value-add have been defined based on the research.

Section	ID	Description	Intent
Authentication	1.1	As a new user, I want to register an account to access the platform's features.	Facilitate new user onboarding.
	1.2	As a returning user, I want to login quickly to access my dashboard and feedback.	Speed up user re-entry to the platform.
Dashboard	2.1	As a manager, I want to view the overall sentiment development within my team.	Enable longitudinal understanding of team sentiment.
	2.2	As a manager, I want to see the current sentiment status.	Provide real-time insights into team mood.
	2.3	As a manager, I want to see the most pressing topics highlighted on my dashboard.	Prioritize key issues requiring immediate attention.

	2.4	As a manager, I want to apply filters to the dashboard views (e.g., by departments, roles, etc.).	Enable customized data views for in-depth analysis.
Chat Interface	3.1	As an employee, I want to set privacy settings on my chat.	Ensure user privacy.
	3.2	As an employee, I want to have a real-time conversation to provide immediate feedback.	Real-time interaction for immediate feedback and acknowledgment.
Feedback Deep Dive	4.1	As a manager, I want to see a list of all collected feedback (except for anonymous entries).	Consolidate visible feedback for analysis.
	4.2	As a manager, I want to click into a single feedback entry to see more details.	Enable granular feedback analysis.
	4.3	As a manager, I want to see a list of pressing topics along with summaries and actionable recommendations.	Provide actionable insights on pressing issues.
	4.4	As a manager, I want to apply filters to the feedback list to narrow down the results.	Customizable data filtration.
User Management	5.1	As a manager, I want to view a list of employees along with their current mood status.	Holistic view of employee well-being.
	5.2	As an admin, I want to manually create a new user when needed.	Flexibility in user management.
	5.3	As a manager, I want to deep-dive into individual user details including specific feedback and recommendations.	Enable individualized analysis and action planning.

Table 1: User Stories

3.2.2. User Interface Design

Now that UX design has been explored through the gathered theoretical and empirical data, it is essential to visually represent everything in a way the user will instinctively be able to operate with. Instead of going straight to developing the full MVP, we chose to build a frontend demo first that could be tested in an interactive manner. Our justification for doing this was to validate the solution and its' features we have translated from the data once more to minimize the risk of our first MVP being misguided. Additionally, wireframe modelling is often done in frontend development as a first step to create a blueprint for the developer to abide by (Experience UX n.d.). However, to save some time and work capacity, we opted to skip the step of intricate wireframing and go straight to designing a full frontend demo that could be tested.

As per the previous justification of skipping intricate wireframing, Visily was chosen as the tool with which the frontend demo was to be built. Visily offers an intuitive framework of features with which the user is able to swiftly create state of the art prototypes by integrating AI (e.g. option to create from sketches, screenshots, text) (Visily n.d.). Although Figma is the number one ranked tool for prototyping software (Gartner n.d.) Visily was the superior choice for our team due to its simplistic and intuitive nature. Moreover, Visily allows for quick and easy export possibilities into Figma should Visily prove to be limiting in future endeavors.

With the pre-categorized features and concrete user stories in mind to inform the frontend demo build, we moved quickly and set up the demo inside Visily for the first user demo tests. Figure 1 shows the main dashboard screen for the decision makers in Visily. The full demo can be accessed via the QR code in Appendix 3.

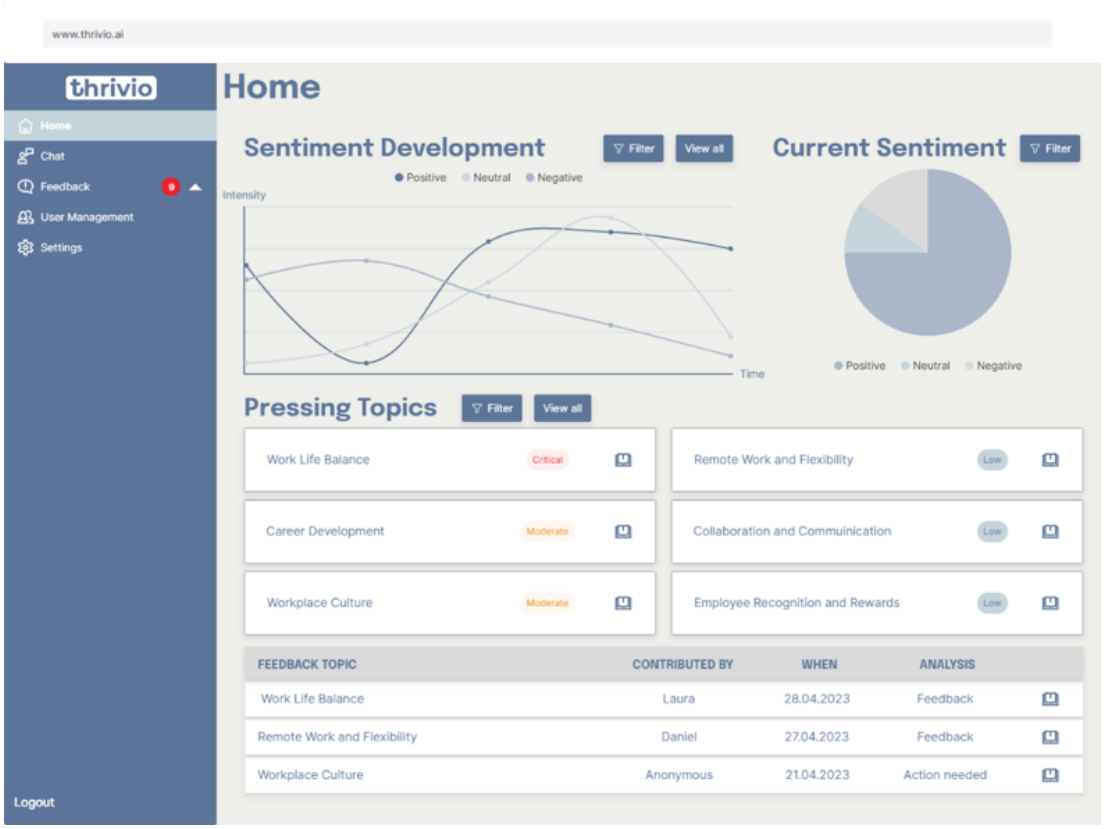

Figure 2: Frontend Demo Dashboard

3.2.2.1. Frontend Demo Testing

The rationale for conducting a frontend demo test as an intermediate step are multifold. Firstly, it serves as a risk mitigation strategy, offering a 'safety net' of sorts before diving into the full-fledged development of the MVP. By focusing on predefined goals—namely, data relevance and ease of use—the frontend demo aims to validate the value, usability, and actionability of the data presented. This step is essential in achieving great UX and UI design which will in turn make it possible to develop the first MVP with lower risk of misdirection.

The following Chapter will inform about the initial setup of the frontend demo as well as explain the various findings from it. The insights garnered here will be instrumental in understanding and potentially adapting the UX/UI design to shaping the MVP development.

3.2.2.1.1. Methodology

To pinpoint our demo and its findings we chose to pre-define two main goals of the frontend test: Data relevance and ease of use. Specifically, the aim was to validate the value of the presented data, the UX design, and UI design of the platform before moving on to the first MVP build. As for participants we followed up with earlier interview partners who were already familiar with the idea as this would conform to actual customers of the platform itself by them having researched into potential tools. Ideally, we would win most of these people over and go on to conduct our first live MVP test with them. Given the time constraints, this Chapter adopts an iterative yet focused methodology where only one version of the frontend is tested, and A/B testing is neglected as it would exceed the scope. Guided interviews are chosen as the primary data collection method, designed to extract maximum qualitative insights within a limited timeframe. Realistic test scenarios were created that the test subjects would typically perform

inside the platform for their organization. The intent is to stay as close to reality as possible to determine the usefulness and value-add of the platform in a real-world setting.

The following scenarios were to be tested:

1. **Current Organizational Sentiment**: Navigate to the dashboard and interpret the current sentiment metrics.
2. **Employee Happiness Over Time**: Use the time-based graphs to gauge employee happiness trends.
3. **Top 3 Pressing Topics**: Identify the top 3 pressing topics that need immediate attention.
4. **Deep Dive into Work-Life Balance**: Analyze the detailed feedback on work-life balance and summarize your findings.
5. **Latest Feedback on Work-Life Balance**: Locate the feedback overview and read the latest feedback entries concerning work-life balance.
6. **Employee Overview**: Browse through the user management section and comment on its utility.

Essentially, the test itself will start with an introduction explaining the goals of the test and what is to be expected. A walkthrough of the platforms main features follows without going into detail before presenting the scenarios the test subjects are to play out. Then, after each scenario, questions will be asked related to the goals of the frontend test. The debrief will close the test and discuss the overall findings as well as inquire into additional feedback. A full overview of the test script can be found in Appendix 4.

3.2.2.1.2. Results

Due to time constraints, and this frontend demo being an intermediate step to minimize risk in developing the first iteration of our MVP, no concrete methodology for the analysis of our test transcripts were chosen. This allows us to save time in the actual development phase and gather insights swiftly to create a great product in a short time. However, the transcripts were analyzed similarly to the Mayring content analysis. Here, the different scenarios will serve as thematic units.

Current Organizational Sentiment: Across multiple organizations (Blockchance, Codigo, Messe Husum, netzstrategen, Rameder), participants found the sentiment interpretation straightforward but faced challenges with color differentiation. The common suggestion was to improve color differentiation and add numeric percentages for clarity.

Employee Happiness Over Time: Valued for showing trends, this feature's usability was rated high. Participants from different organizations consistently suggested the need for better color differentiation, additional data like exact dates, and clarification of intensity levels and time scales.

Top 3 Pressing Topics: Work-life balance, career development, and workplace culture were frequently identified as top concerns – which was the correct interpretation. Participants found this section easy to interpret but required more actionable information and deeper insights into why these topics were pressing. This was to be expected, as they would not know that the next scenario would make them delve deeper.

Deep Dive into Work-Life Balance: The summarization of recommendations from feedback was seen as valuable. However, participants partially assumed it was the summarization of a

single employee's conversation, indicating the need for better clarification. Additionally, the want for a text box to note down measurements taken and an adaptable rating scale for the recommendations were expressed. Although mostly positive, it was also noted that the info felt superficial and not always actionable which could be solved through concrete company data context. Andre from netzstrategen also suggested including a feature to facilitate direct conversations with individuals expressing concerns regarding work-life balance due to the potential importance of distinguishing between broad issues and individual, personal concerns, to avoid misdirecting efforts and wasting time on unaddressed or misidentified issues.

Latest Feedback on Work-Life Balance: Accessibility of the latest feedback was acknowledged, but its value was subject-dependent. Again, design in terms of colors, widget alignment, etc. was noted and a desire to use the information in a separate workspace to organize possible interventions was expressed. The common suggestion was to focus on the context and actionability of the feedback without immediate improvement needs specified.

Employee Overview: This section was found straightforward and valuable. A notable suggestion from Messe Husum was the implementation of a social feedback feature, enabling employees to interact with each other's feedback and prioritize issues based on collective feedback. Another add-on noted by Blockchance were dual-source importance ratings and the development of detailed dashboards for various user levels. Sara from Codigo expressed the need for various views (teamview, roleview, etc.) while Andre from netzstrategen wanted to see the most critical employees in terms of mood. Overall, this means the feature should come with more filters and sort options.

Across the different organizations, a consistent theme was the need for more intuitive and actionable data presentation. Participants appreciated the tool's potential but emphasized the

importance of clear, actionable insights, and user-friendly interface design. Privacy and trust in handling employee data were also highlighted as key considerations. The frontend analysis indicates a strong foundation for the tool with specific areas for enhancement. The emphasis on actionable insights, user-friendly design, and privacy considerations forms the cornerstone for future development iterations. The feedback will guide the refinement of the MVP, aiming to align it more closely with user needs and organizational contexts while also informing the future development roadmap.

4. MVP Testing

In our study, we implemented a methodical approach for testing the Minimum Viable Product (MVP) within an organizational setting, aimed at assessing its practicality, user experience, and data analytic capabilities. This was an essential step for this project, as the role of data-driven insights and user-centric design cannot be overstated. Most of all, because knowledge is recognized as a significant resource for software development (Ouriques 2023). An empirical evaluation was pivotal in refining the platform's functionality and usability while assessing value-add for potential customers with the previous product limitations in mind. The MVP testing targeted a diverse group of users, comprising both employees and decision-makers, to ensure a comprehensive understanding of the platform's utility across different user interactions. While the problem identification and literature review laid the groundwork for solution ideation, it is the testing phase that now truly validates the feasibility, efficacy, and relevance of the proposed solution. This Chapter delves into the critical step of MVP testing after having strategically integrated the intermediate step of performing a front-end demo test. The insights are expected to support us in understanding strengths, weaknesses, and operationality of the core product. This is again expected to have a crucial impact on the final product, thereby playing a pivotal role in the venture's ultimate success. The findings from the frontend demo in conjunction with the initial MVP test will also serve as a foundational pillar for subsequent iterations and, eventually, the full-scale product launch.

4.1. Set-up of the operation and procedure

The MVP testing round started in leveraging our network to find suitable potential customers who are willing to test our prototype for a work week, simulating real-world usage. Employees of participating companies interacted daily with the platform's chat feature to provide feedback

and share experiences, while decision-makers employed the dashboard to analyze data, offering insights into the platform's analytical depth. This approach was designed to mimic authentic user scenarios, providing valuable insights into user engagement and platform performance. Accompanying the testing phase, an intuitive onboarding process was established as previously outlined in the 'Welcome' module description, featuring instructional resources to facilitate user acquaintance with the platform's functionalities. This step was crucial for enabling autonomous and efficient user interactions, reflecting potential real-life adoption scenarios.

After the MVP testing period, a mixed methods approach will be used again to collect valuable insights. This method stems from the core principles of the agile software development method, called Dynamic System Development Method (DSDM) (Alsaqqa 2020). It focuses on quality-centric methodologies and incorporates RAD techniques, employing prototyping to ensure the iterative approach throughout the development process (Coleman 1998). What we use for this MVP testing round is the 4th phase of the DSDM. In this phase, the user's feedback is used to enhance the system iteratively. (Alsaqqa 2020) The feedback will be collected through a survey (Appendix 5), targeted to employees and an interview (Appendix 6), targeted to decision makers. So, a tested software with an at least minimal set of the requirement is the result of this step (Alsaqqa 2020).

4.2. Evaluation Methods

In our MVP testing analysis, we leveraged both survey data and interviews, supported by the examination of interview transcripts and survey results. Adopting a narrative analysis approach, we delved into the scripts, identifying pertinent segments and assigning codes to represent various aspects such as UI design, operational capabilities, and overall satisfaction with the MVP (Khanna 2018). This deliberate choice of a narrative approach stems from its ability to

uncover implicit knowledge and provide nuanced insights within organizations. This method proved invaluable for understanding the intricacies of MVP testing, aiding rapid changes and adjustments of our prototype. The efficacy of this approach is emphasized by recognizing the constraints of traditional research methods in capturing the depth of user experiences, particularly in the context of MVP testing and real user feedback. (Mitchell 2003)

4.3. User Insights from MVP Testing

In our ongoing quest to refine the MVP, our recent testing round with ‘Vivid Planet’ marked a strategic milestone, offering invaluable insights. Despite challenges that reduced our pool of participating companies from 8 down to only 1, the collaboration with ‘Vivid Planet's’ skilled team, including software developers, product owners, project managers, cloud architects, as well as the CEO, yielded crucial feedback shaping our product's future development. With over two decades of experience in digital agency and software development, ‘Vivid Planet’ is a collaborative force with extensive technical expertise. An overview of all prospected participants can be found in Appendix 10.

Incorporating lessons learned and insights gained into our prototype, the outlook for future testing rounds is promising. The upcoming study setting aims to include at least one Subject Matter Expert for a comprehensive evaluation. Despite challenges in the MVP testing round, our focus on extracting valuable insights has proven fruitful. Lessons learned illuminated strengths, weaknesses, and emphasized the need for a broader range of testers and extended testing duration. Those lessons coupled with feedback, are already shaping the refinement of our prototype for subsequent testing phases. Looking ahead, our strategic commitment to including a broader range of testers and extending testing duration underscores our dedication to continuous improvement and a more robust validation process.

4.3.1. Employee Survey

In the narrative analysis of *Thrivio* MVP survey data, three key themes emerged from closed question research: Overall Satisfaction, UI Design, and Operational Capabilities.

Satisfaction Level: *Thrivio* MVP demonstrated strengths in user satisfaction, with diverse experiences and an average rating around the mid-scale, which was neither positive, nor negative. Employees particularly liked the chatbot's conversational abilities, finding them engaging and innovative. The technical performance, powered by the new GPT-4 model, received strong approval. However, some employees expressed a desire for more concise AI responses, suggesting that streamlined communication and company-specific context would enhance the overall user experience.

UI Design: Employee feedback on UI design was generally positive, with specific areas flagged for refinement. Employees liked the intuitiveness of the chat window but suggested improvements for enhanced engagement, like an increase of the size. Tweaks in navigation were suggested to make the interface more user-friendly. This feedback provides a roadmap for targeted UI enhancements aligning with employee and user preferences. Diverse suggestions for additional features, including personalized experiences like naming the chatbot, underscored the platform's potential for expansion in terms of UI.

Operational Capabilities: Operational capabilities received mixed feedback, reflecting diverse employee experiences. On average, employees rated these capabilities positively, appreciating certain features. However, varying opinions emerged on how well the platform meets operational needs. Some employees suggested additional features, like naming the

chatbot or presenting shorter and more informative summaries in the dashboard, opening opportunities for future development. Balancing new implementations with refining existing features is crucial for advancing operational effectiveness.

4.3.2. Decision Maker Interview

The integration of the interview feedback into the MVP entails key steps. The CEO of Vivid Planet stressed the need for concise chatbot responses, urging algorithm adjustments for brevity: ‘The chatbot should respond more concisely.’ Addressing data privacy, guidelines ensuring anonymization were emphasized, alleviating concerns about employer access: ‘The concern is that data privacy might be compromised, or I might face issues if I input something.’ Dashboard development for detailed analyses and valuable mood tracking was highlighted: ‘Within the company, it's very interesting to know the mood, how the mood is. So, from this perspective, having a value that I can compare over time is a great thing.’ For a successful product launch, a free trial period with low entry prices was proposed: ‘Do you provide a trial phase? The first year for free, I don't know, something like that.’

Security and data privacy enhancements, crucial for sensitive information, were underscored: ‘So, on the one hand, it's your part, and on the other hand, it's the part of the AI that you integrate as an API.’ The product's USP, continuous feedback, was praised: ‘It is your USP, the whole thing is earlier and ongoing.’ Frequency concerns prompted suggestions for more feasible engagement, whether ongoing, weekly, monthly, or with reminders: ‘Daily is a bit tough, but somehow ongoing, weekly, monthly, or even monthly with reminders.’

Acknowledging implementation costs, our interviewee noted, ‘It costs time for the employees, it costs time for the setup, maybe time for the connection between our login system and yours.’ Internal marketing's pivotal role was emphasized: ‘The question is, how do you approach it from a marketing perspective, internal marketing, how do you sell it within the company, and

how often do you want it?' Sensitivity surrounding mental health feedback prompted security importance: 'Because imagine, it has some kind of feedback saying, 'I am not doing well psychologically,' then that is a very sensitive piece of information.'

Despite challenges, optimism prevailed, recognizing the tool's potential value to organizational dynamics and decision-making: 'I would like to have the data and, as cost-effectively as possible, to have a basis for decision-making.'

5. Conclusion and Future Roadmap

To assess the likelihood of success for a startup or an idea, various metrics and factors are taken into consideration. Typically, these can be distilled into two fundamental areas:

1. The product
2. The business model

To evaluate the prospects of a product, one fundamentally assesses the opportunity, innovativeness, and other factors such as its differentiation from comparable products. This work has extensively demonstrated that significant changes in the workplace, broadly encapsulated by the term 'New Work', along with the technological opportunities arising from the rapid advancement of LLMs, present an opportunity to develop a new product that leverages these changes to innovatively address a problem.

Derived from the challenge companies face in achieving high employee satisfaction and efficiently collecting and evaluating feedback, the concept for *Thrivio* was conceived. The initial product concept was evaluated and validated through interviews. Based on this, initial frontend mockups were created, which in turn were tested with various potential customers. The feedback from these assessments informed the development of the MVP. The approach of alternating between testing and development aimed to tailor the product to customer desires. To develop a functional MVP within the limited time and resources of this work, a low-code tool was utilized. This allowed for a swift transition to a live test environment with the MVP, obtaining initial genuine feedback on a basic version of *Thrivio*.

The business model, typically representing a company's structures and processes for developing, producing, and marketing a product, was extensively validated in this work. It can

be concluded that *Thrivio* would operate in a growth market and, despite existing and established competitors, could have significant success through a specific niche with an innovative product.

In summary, this thesis provides a solid foundation for the opportunity of an AI-supported tool for the automated collection and analysis of qualitative employee feedback, and the potential business model for *Thrivio* has fundamental prospects for success.

Subsequent steps derived from this include conducting further tests with the MVP to enhance the data foundation for evaluating the tool's value proposition fulfillment. Additionally, further validation of the business model will be achieved through ongoing discussions with potential customers, particularly regarding purchase intent and price sensitivity.

In the medium term, *Thrivio* aims to be positioned as a relevant tool in the HR landscape in Germany. This requires planning and implementing the initial steps for establishing a company, which particularly involves addressing legal questions such as company formation, financing, and fundamental structures and processes.

Based on the results of this thesis, the team will comprehensively evaluate whether to pursue the actual development of *Thrivio* beyond the MVP - potentially with an expanded and thus more complex tech stack. Overall, the results permit a positive overall evaluation of the opportunity, the product idea, and the MVP.

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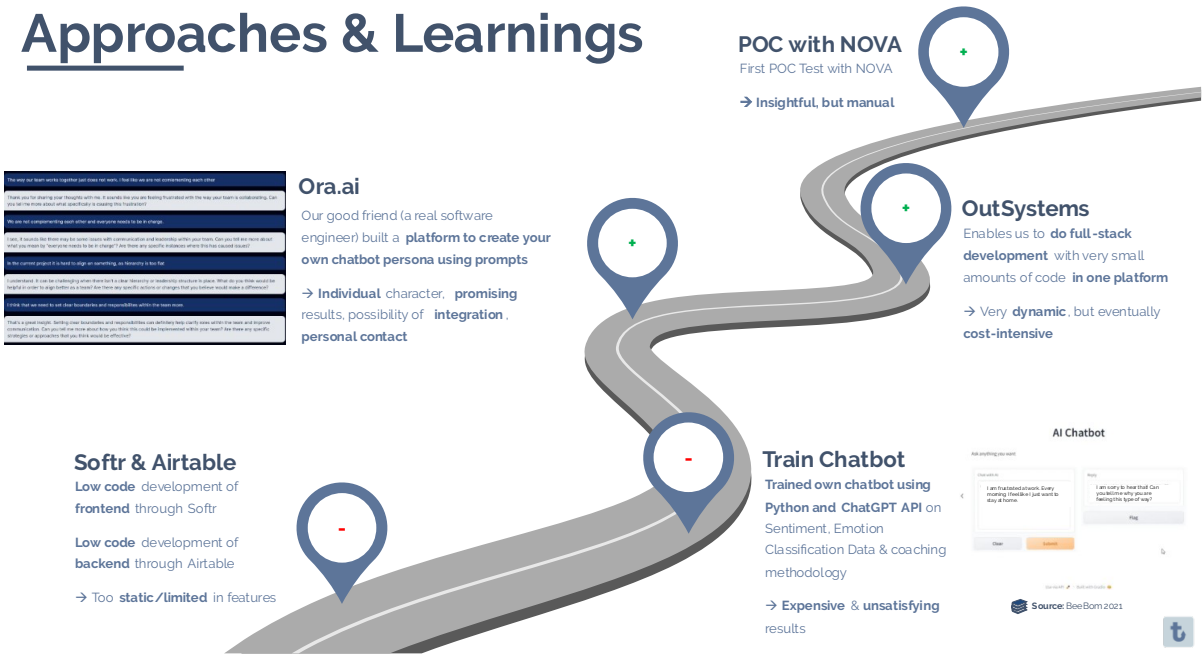
Appendix

Appendix 1: Empirical Research Employee Survey

Section	Question	Intent of Question	Answer Options
Socio-Demographics	What gender do you identify as?	Figuring out who we reached and potentially filtering out responses.	Male, Female, Prefer not to say, Other
	How old are you?	-	18-24, 25-34, 35-44, 45-54, 55-64, 65+
	What country are you from?	-	[Open Text Field]
	What is your employment status?	-	Self-employed, Employed (full-time), Employed (part-time), Unemployed
	How many people does your company employ?	-	0-10, 10-50, 50-100, 100-500, 500+
Status Quo Assessment: Feedback Evaluation at Workplace	Does your workplace use structured approaches or employ systems to collect bottom-up employee feedback?	To understand current feedback collection processes and assess assumptions.	Yes, No, Not sure
	Please select the approaches or systems that are currently in place at your workplace.	To better understand current processes of feedback collection.	Anonymous Suggestion Box, Surveys, One-on-one Meetings, 360-Degree Feedback, Digital Feedback Platforms, Open Door Policy, Town-Hall Meetings, None, Other
	How satisfied are you with the current methods of providing feedback at our organization?	To gauge satisfaction with existing feedback mechanisms.	Scale: Very Satisfied (10) to Very Unsatisfied (0)
	How often do you feel the need to provide feedback or raise concerns about workplace issues?	To quantify the frequency of feedback needs.	Scale: Very often (10) to Never (0)
	How comfortable do you feel providing honest feedback to management?	To understand barriers to providing feedback.	Scale: Very comfortable (10) to Very uncomfortable (0)
	To what extent do you believe that your feedback is currently being acted upon?	To assess the effectiveness of the current feedback loop.	Scale: Always (10) to Not at all (0)
Feature Proposal & Assessment	Would you prefer to give feedback anonymously?	To identify the need for anonymity in feedback.	Yes, No, It depends
	What topics do you most often have feedback about?	To categorize areas of concern and focus for the platform.	Work environment, Leadership, Team dynamics, Managerial effectiveness, Company policies, Other

	How would you evaluate a dedicated platform with full privacy data control for employee feedback?	To validate the business idea and privacy feature.	Scale: Very useful (10) to Not useful (0)
	Would you use a chatbot-based platform to provide feedback?	To evaluate acceptance of a chatbot-based interaction model.	Yes, No, Maybe
	How often would you be willing to interact with a feedback platform?	To gauge engagement levels for frequency of prompts.	Daily, Weekly, Monthly, As needed
	If there was a perfect bottom-up feedback system, what would the main benefits be for you?	To identify gaps in existing systems and prioritize features.	Voicing concerns with anonymity, Instant acknowledgment, Venting feelings, Real-time tracking, Personalized recommendations, Real-time responses, Skill development, Career path planning, Inclusive dialogue, Larger voice in organization, Information on feedback progress, Other
	Would you prefer the platform to be integrated into existing tools?	To decide on accessibility points for user convenience.	Yes, No, Not sure
	What mode of interaction would you prefer for the feedback platform?	To find out preferred communication medium.	Text-based, Voice-based, Both
	Would you value the inclusion of wellness and work-life balance topics in the platform?	To assess demand for well-being and work-life balance topics.	Yes, No, Maybe
End of Survey	Would you be open to participating in a trial run of our proposed platform?	To gauge willingness to engage in a pilot test.	[Open Text Field for Email]
	Do you have any further insights or suggestions?	To capture additional thoughts or ideas to improve the platform.	[Open Text Field]

Appendix 2: Pre-Thesis Product Journey



Appendix 3: Frontend Demo QR Code

Appendix 4: Full Frontend Demo Script

Introduction: Welcome and thank you for participating in this demo test. Today, we're focusing on evaluating the value of the data presented in our new platform designed to enhance workplace culture. Your insights will be invaluable in refining this MVP. As a first step I will give you a very quick walkthrough of the demo and show you some screens without going into too much detail. Afterwards I will be presenting you with some scenarios or questions that could arise in the everyday use of the platform. I want you to think about the scenario and try to act it out how you would if it was a live platform that is used at your workplace. While doing so, please state your thoughts to me and explain how you are going about acting out the scenario on the platform. Essentially, just state your thoughts while acting out the scenario. After you are done with each scenario I will be asking you specific questions. When we are done with all scenarios I will have a quick debrief with you to gauge your overall thoughts on the demo. This will end our test. Are you okay with this procedure and the recording of it?

Scenarios

1. **Current Organizational Sentiment**: Navigate to the dashboard and interpret the current sentiment metrics.
2. **Employee Happiness Over Time**: Use the time-based graphs to gauge employee happiness trends.
3. **Top 3 Pressing Topics**: Identify the top 3 pressing topics that need immediate attention.
4. **Deep Dive into Work-Life Balance**: Analyze the detailed feedback on work-life balance and summarize your findings.
5. **Latest Feedback on Work-Life Balance**: Locate the feedback overview and read the latest feedback entry concerning work-life balance.

6. **Employee Overview**: Browse through the user management section and comment on its utility.

Questions

1. **Data Interpretation**: Was the data presented easy to interpret?
2. **Data Relevancy and Value**: Did you find the data relevant and valuable (and actionable)?
3. **Usability**: On a scale of 1-5, how would you rate the usability of this feature?
4. **Improvements**: Any suggestions for improving this feature?

Debrief: Thank you for taking the time to go through the demo test. Your insights are invaluable to us as we aim to refine this MVP into a tool that genuinely adds value to managerial decision-making in workplace culture.

Open-Ended Questions:

1. **Overall Impressions**: 'What are your initial thoughts on the platform after going through the demo?'
2. **Most Valuable Feature**: 'Which feature or data point did you find most valuable or insightful?'
3. **Data Gaps**: 'Were there any data points or features you felt were missing or could be expanded upon?'
4. **Data Presentation**: 'How do you feel about the way the data is presented? Is it intuitive and easy to understand?'
5. **Actionable Insights**: 'Do you think the data presented would help you make informed decisions? Why or why not?'

6. **Usability**: ‘Were there any elements of the platform that you found confusing or difficult to navigate?’
7. **Privacy and Trust**: ‘How do you feel about the privacy options provided for employees? Do you think it fosters a sense of trust?’
8. **Additional Comments**: ‘Do you have any other comments, questions, or suggestions for us?’

Closing: Thank you so much for your time and effort in this demo. We really appreciate your immense help and support of our project. We plan to incorporate your feedback into the next iteration of our MVP and would love have chance at testing the first MVP iteration in your organization. Your feedback is and would be crucial to our development process. Would you be interested in running a test run of about 1 or 2 weeks at your organization?

Appendix 5: Customer Persona: Employee Experience with *Thrivio*

To ensure the successful adoption and effectiveness of *Thrivio*, it is important to view the platform from the perspective of its end users - the employees. This chapter outlines a customer persona that reflects the typical employee who would engage with *Thrivio* to provide feedback within their organization.

Persona Overview:

Name: Daniel Zhang

Age: 29

Occupation: Software Developer

Location: Berlin, Germany

Company size: Mid-sized technology company with 250 employees

Background:

Daniel Zhang embodies the *Thrivio* employee persona. As a software developer with five years of experience in a fast-paced tech environment, Daniel understands the importance of effective communication and the need for a positive work culture that fosters growth and innovation.

Goals:

Contribute to the company culture and influence positive change.

Have his voice heard in a way that respects his privacy.

Receive timely feedback on his concerns and see them addressed.

Challenges:

Often finds traditional feedback mechanisms intimidating or ineffective.

Worries about the confidentiality of feedback affecting career progression.

Wants more than periodic surveys - wants ongoing, dynamic interaction.

Wants a feedback system that is integrated into their daily workflow.

Behavioral attributes:

Daniel is comfortable with digital tools but prefers interfaces that are intuitive and non-disruptive.

He appreciates transparent communication and is more likely to engage when he trusts the confidentiality of the system.

He prefers feedback that leads to actionable results rather than vague assurances.

Product Interaction: Daniel would use *Thrivio* to:

Provide feedback anonymously to ensure his privacy is protected.

Provide insight into team dynamics and workplace challenges.

Interact with a system that learns and prompts for feedback at relevant times.

See and track how his feedback contributes to organizational change.

Expectations from *Thrivio*:

An intuitive platform that can be accessed easily.

Assurance that feedback remains anonymous and is used constructively.

Visibility into how feedback is being used and its impact on the workplace.

A positive change in the workplace that can be linked back to employee input.

End-User Experience:

Daniel expects that by engaging with *Thrivio*, he will feel more connected to his company's culture and decision-making processes. He hopes to see a tangible link between the feedback provided and subsequent changes or initiatives implemented. Ultimately, Daniel looks for validation that his contributions are valued and that his wellbeing is a priority for the organization.

Appendix 6: MVP Test Survey (after 5 days of testing):

Section	Question	Intent of Question	Answer Options
Feedback with Chatbot	What was your initial reaction to expressing feedback with a chatbot?	To gauge the participants' initial sentiments and comfort level with using a chatbot for feedback.	Extremely positive (1), Somewhat positive (2), Neither positive nor negative (3), Somewhat negative (4), Extremely negative (5)
	How unique is this solution compared to other products you are familiar with?	To assess the perceived uniqueness of the chatbot solution in comparison to other known products.	Extremely unique (1), Very unique (2), Somewhat unique (3), A little unique (4), Not unique at all (5)
	How appealing is this solution compared to other products you are familiar with?	To understand the level of appeal the chatbot solution holds compared to other familiar products.	Extremely appealing (1), Very appealing (2), Somewhat appealing (3), A little appealing (4), Not at all appealing (5)
	How much did you like or dislike the chatbot interactions?	To gather feedback on the participants' overall liking or disliking of the chatbot interactions.	Very much (1), A moderate amount (2), A little (3), Neither like nor dislike (4), Dislike a little (5), Dislike a moderate amount (6), Dislike very much (7)
	How realistic do you think this platform is for being used in organizations as their main tool for collecting employee feedback?	To assess the perceived feasibility of the chatbot platform as a primary tool for collecting feedback in organizations.	Extremely realistic (1), Moderately realistic (2), Slightly realistic (3), Neither realistic nor non-realistic (4), Slightly unrealistic (5), Moderately unrealistic (6), Extremely unrealistic (7)
	I would use the chatbot as a tool for providing feedback	To gauge the participants' willingness to use the chatbot as a tool for providing feedback.	Strongly agree (1), Agree (2), Neither agree nor disagree (3), Disagree (4), Strongly Disagree (5)
	From the list below, which best describes your thinking about our platform?	To understand the participants' perception of the necessity and improvement offered by the chatbot platform.	I need it because nothing else solves this problem (1), This would be slightly better than what I am currently using (2), This is essentially the same as what I am currently using (3), What I am currently using is better than this (4), I don't see any reason to use this (5)
	How did you perceive the overall user interface?	To gather feedback on the participants' perception of the user interface of the chatbot platform.	Excellent (1), Good (2), Average (3), Below Average (4), Poor (5)
	If you checked out the dashboard, how did you perceive the usage of your data?	To assess how participants perceived the usage and transparency of their data within the chatbot platform's dashboard.	Transparent and Informative (1), Adequate (2), Neutral (3), Limited (4), Unclear or Insufficient (5), I did not check it out (6)
	Did you have any concerns about your	To understand the level of concern participants have regarding the	Yes, many (1), A few (2), Not at all (3)

	private data when it comes to the chatbot?	privacy of their data in the context of the chatbot.	
Open Questions	What did you like MOST about our platform?	To gather detailed insights into the aspects of the platform that participants found most favorable.	[Open Text Field]
	What did you like LEAST about our platform?	To gather detailed insights into the aspects of the platform that participants found least favorable.	[Open Text Field]
	Is there anything that is still missing in order to have a better experience?	To allow participants to provide feedback on any missing elements that could enhance their experience with the platform.	[Open Text Field]
	For what else would you use the chatbot, if you don't want to use it for feedback?	To explore potential alternative uses or functionalities that participants envision for the chatbot.	[Open Text Field]
	Do you have any additional Feedback?	To provide participants with an open space to share any additional thoughts or feedback.	[Open Text Field]

Appendix 7: Full Quantitative Analysis

Demographics

- **Gender**: The sample is almost evenly split between males (51%) and females (49%).
- **Age**: The majority of respondents are between 25-34 years old (65%), followed by 18-24 (29%).
- **Country**: 91% of the respondents are from Germany, aligning well with the target market.
- Analyzed following **dimensions correlation with Gender, Age, and Origin**:
    - Needed frequency of providing feedback
    - Comfortability of providing feedback
    - Preference to give feedback anonymously
    - Preference for integration
    - Willingness to use chatbot-based platform
    - Satisfaction Level of current feedback methods

  → generally very weak correlations so no good predictors of feedback-related variables

Employment

- **Status**: 65% are employed full-time, and 35% are employed part-time.
- **Company Size**: The largest segment (48%) comes from companies with over 500 employees.

Feedback Mechanisms

- **Structured Approaches**: 67% reported that their workplaces use structured approaches for feedback, while 22% said they don't.
- **Most Popular Mechanisms**: One-on-one Meetings with Managers (48 mentions), Open Door Policy (45 mentions), Surveys (37 mentions)

  → shows how time consuming the top 2 mechanisms are and how it cannot deal with the amounts of available data that would be available if you rethink this approach in a automized way; this coupled with the average satisfaction rates suggests that there is huge room for improvement; surveys being right after exemplifies the quantitative nature organizations often resort to

- **Least Popular Mechanism**: Anonymous Suggestion Box (physical) (10 mentions)

Satisfaction Levels

- **Mean Satisfaction Level**: Approximately 6.29 out of 10

  → a lot of improvement potential (this is very neutral or just slightly satisfied)

- **Median Satisfaction Level**: 7.0 out of 10

- **Comfort in Providing Feedback**: Strong positive correlation (0.63)
- **Belief in Feedback Being Acted Upon**: Moderate positive correlation (0.60)
- **Frequency of Need to Provide Feedback**: Moderate negative correlation (-0.43)
- **Employees in Bigger Companies Expressing Dissatisfaction Analysis**

  The Spearman correlation coefficient between the size of the company and the satisfaction level of current feedback methods is approximately 0.16. This indicates a very weak positive correlation between the two variables, suggesting that the size of the company is not a strong predictor for dissatisfaction among the survey respondents.

- **Dissatisfaction Correlating with Anonymity Preference Analysis**

  The Spearman correlation coefficient between the level of dissatisfaction with current feedback methods and the preference to give feedback anonymously is approximately -0.071. This indicates a very weak negative correlation between the two variables, suggesting that dissatisfaction is not a strong predictor for the preference to give feedback anonymously among the survey respondents.

BIG TAKEAWAY:

- **Needed Frequency of Providing Feedback**: Negative correlation (-0.38)

  →suggesting that those who feel the need to provide feedback more frequently are generally less satisfied!

- **Comfortability of Providing Feedback**: Strong positive correlation (0.58)

  →indicating that those who are more comfortable providing feedback are generally more satisfied!

Preferences

- **Anonymity**: A majority (45%) prefer the option ‘It depends’ when it comes to anonymity, while 43% said 'Yes'.

  → shows how most of the people have topics they do not wish to discuss in person, if at all.

- **Most Valued Feature**: Voicing concerns with enhanced anonymity (26 mentions)

  → displays what we see above

- **Least Valued Feature**: Venting feelings (7 mentions)
- **Integration**: 53 out of 69 respondents (76.81%) prefer integration into existing tools like Teams, Slack, etc.

  →suggesting a high level of acceptance for such integration

- **Chatbot Acceptance**
    - The Spearman correlation coefficient between age and willingness to use a chatbot-based platform for providing feedback is approximately **0.09**. This suggests a **very weak positive correlation** between the two variables, implying that **age is not a strong predictor for chatbot acceptance** among the survey respondents.
        - Why spearman?

          Given that both distributions are moderately skewed, the Spearman correlation method would be a suitable choice for this analysis. It is a non-parametric method that does not assume a normal distribution and is less sensitive to outliers.

Feedback Frequency

- **Feedback Frequency**: The frequency with which employees feel the need to provide feedback is spread out, but 16% feel the need at a level of '3'.
- **Correlation with Comfort Level**: -0.37 (Negative correlation suggests that as comfort level increases, the frequency of feeling the need to provide feedback decreases)
- **Correlation with Anonymity Preference**: -0.08 (Weak negative correlation, implying that the preference for anonymity does not strongly influence the frequency of feeling the need to provide feedback)

Hypothesis Tests

Hypothesis Testing Method Selection

Given that the data for all variables involved in the hypotheses are not normally distributed, non-parametric tests are more appropriate for hypothesis testing. Specifically:

1. **Mann-Whitney U Test**: This test is chosen for comparing two independent groups when the data are not normally distributed. It's a non-parametric alternative to the independent t-test.
2. **Spearman's Rank-Order Correlation**: This test is chosen for assessing the strength and direction of the relationship between two variables when the data are not normally distributed. It's a non-parametric alternative to Pearson's correlation.

Hypothesis Testing Results

Here are the results of the hypothesis tests, along with the selected test methods:

1. Anonymity Preference vs Comfort Level

- **Test Method**: Mann-Whitney U Test
- **p-value**: $4.88×10(−22)$ (HOCH MINUS 21)
- **Significant**: True

- Statistically significant difference between the groups preferring anonymity and their comfort levels in providing feedback. This supports the hypothesis that anonymity preference is related to comfort level.

2. Satisfaction vs Action, Engagement Frequency

- **Test Method**: Spearman's Rank-Order Correlation
- **Correlation Coefficient**: -0.378
- **p-value**: 0.0014
- **Significant**: True
- Significant negative relationship between satisfaction levels and the frequency of providing feedback. This suggests that lower satisfaction is associated with a higher frequency of providing feedback, supporting the hypothesis.

3. Chatbot Acceptance vs Age Group

- **Test Method**: Spearman's Rank-Order Correlation
- **Correlation Coefficient**: 0.090
- **p-value**: 0.464
- **Significant**: False
- Did not show a statistically significant relationship between chatbot acceptance and age group. This means the hypothesis that chatbot acceptance varies with age is not supported by the data.

4. Employees in Bigger Companies Expressing Dissatisfaction

- **Test Method**: Mann-Whitney U Test
- **p-value**: 2.74×10−16

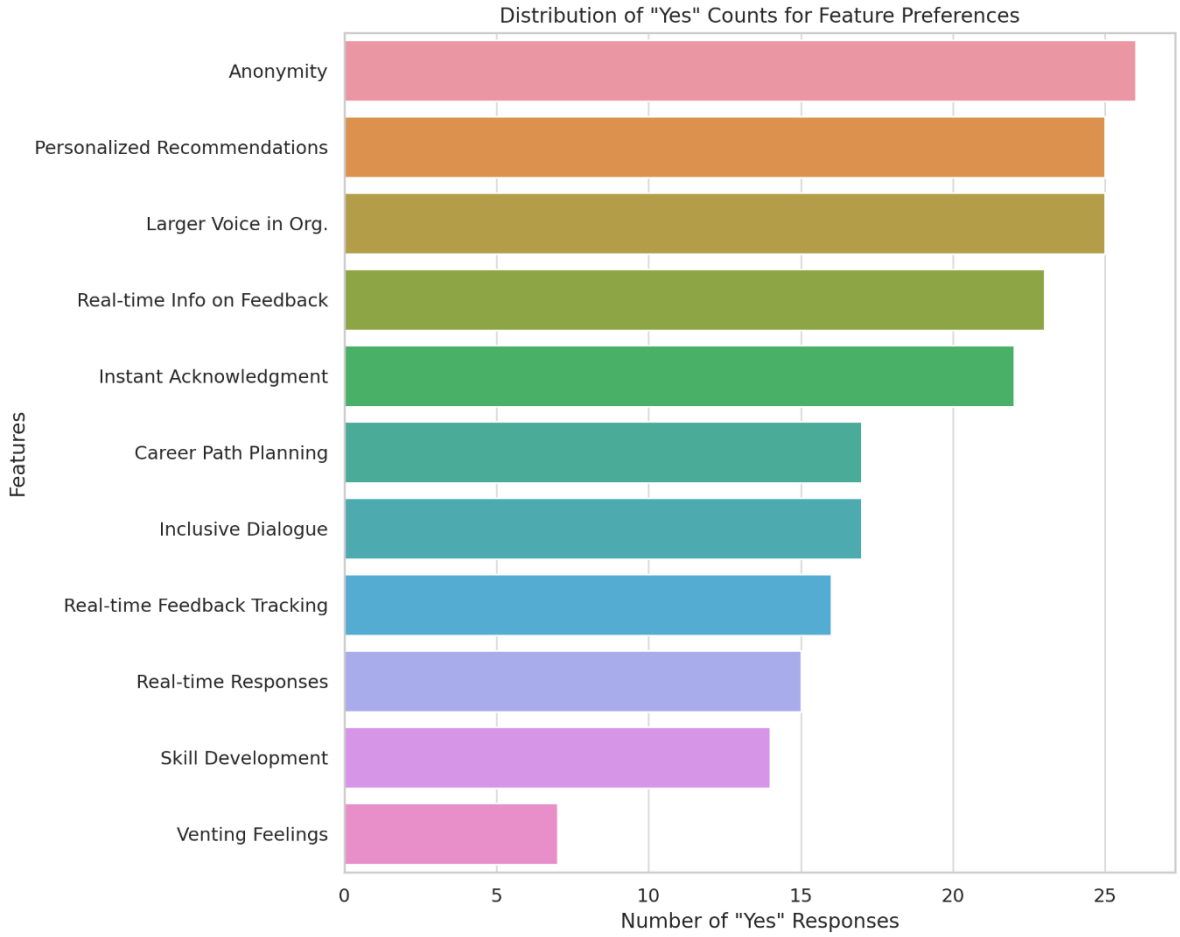
  2.74×10−16

- **Significant**: True
- Significant difference in satisfaction levels between employees in larger and smaller companies. This supports the hypothesis that employees in bigger companies are more often dissatisfied with current feedback methods.

Rationale for Test Selection:

1. **Mann-Whitney U Test**: This non-parametric test was chosen for the hypotheses 'Anonymity Preference vs Comfort Level' and 'Employees in Bigger Companies Expressing Dissatisfaction' because we are comparing two independent groups and the data are not normally distributed.
2. **Spearman's Rank-Order Correlation**: This non-parametric test was chosen for the hypotheses 'Satisfaction vs Action, Engagement Frequency' and 'Chatbot Acceptance vs Age Group' because we are assessing the relationship between two ordinal or continuous variables, and the data are not normally distributed.

Appendix 8: Feature Preference Distribution



Appendix 9: Interview Transcripts

Disclaimer: To avoid unnecessarily increasing the size of this document, the interview transcripts have been digitally stored and are accessible at any time. The digital upload stamp ensures that no retrospective changes can be made to the files.

Interview Transcripts – Problem Validation

- **Transcript 1:** Problem Validation Interview with Ole Besendahl, 5AM
- **Transcript 2:** Problem Validation Interview with Eduardo Mendes, BGA
- **Transcript 3:** Problem Validation Interview with Dennis Martinez, Ora.AI

- **Transcript 4:** Problem Validation Interview with Henry-Ives Coco, Rameder
- **Transcript 5:** Problem Validation Interview with Maija Muntila, Slush
- **Transcript 6:** Problem Validation Interview with Nova SBE

Interview Transcripts – Tech Stack Validation

- **Transcript 8:** Tech Stack Validation Interview with Tameesh Biswas
- **Transcript 9:** Tech Stack Validation Interview with Sunny Crimson

Interview Transcripts – Frontend Demo

- **Transcript 10:** Frontend Demo Test Interview with Fabian Friedrich, BLOCKCHANCE
- **Transcript 11:** Frontend Demo Test Interview with Arne Föste, Messe Husum
- **Transcript 12:** Frontend Demo Test Interview with Sara Fonseca, Codigo
- **Transcript 13:** Frontend Demo Test Interview with André Hellmann, netzstrategen
- **Transcript 14:** Frontend Demo Test Interview with Henry-Yves Coco, Rameder

Interview Transcripts – Frontend Demo

- **Transcript 15:** MVP Test Interview with Vivid Planet (English)
- **Transcript 16:** MVP Test Interview with Vivid Planet (German)

Appendix 10: MVP Test Participation Prospects

Company	Participated?	Cancellation Reason
Academia de Código	No	Contact person quit job last minute; replacement could not initiate fast enough
Brave Generation Academy Administration Team	No	Contact person quit job last minute; replacement could not initiate fast enough
Brave Generation Academy Adult School	No	Test was set up and initiated, but nobody properly used the platform according to the requirements
Kobaltblau Management Consultants GmbH	No	Set up a call; Got ghosted
Rameder Anhängerkupplungen und Autoteile GmbH	No	Internal restructuring and time scarcity before Christmas time
Sandoz Group AG	No	Privacy issues
TalentRocket GmbH	No	Test was set up and initiated, but nobody properly used the platform according to the requirements
Vivid Planet GmbH	Yes	-