EXPLORING THE GENERATIVE AI FOR SMALL BUSINESS: A DESIGN THINKING APPROACH

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ABSTRACT

Operations and management are key components of running a successful small business, but they can provide obstacles owing to limited resources and expertise. As small firms negotiate the complex landscape of management, using cutting-edge technology such as Generative Artificial Intelligence (AI) and design thinking offers a promising path for optimizing operations and boosting growth. The integration of Generative AI technology has the potential to transform small business management practices by providing automation, predictive analytics, and personalized insights. However, successful implementation involves a thorough understanding of consumers' wants, preferences, and pain areas. Design Thinking, a human-centered approach to innovation, provides a framework for connecting Generative AI products with the specific needs of small business owners. This study makes an effort to use empathy maps to pinpoint the issues small businesses face when integrating GenAI into their operations.

Businesses can customize their approach to using or implementing Generative AI solutions to address important problems, relieve pain points, highlight gains, and provide valuable insights to their consumers by understanding the viewpoint of small business owners and stakeholders.

This study's primary goal is to investigate how small organizations might use Generative Artificial Intelligence (AI) to boost competitiveness, foster creativity, and increase operational efficiency via the lens of Design Thinking. Using empathy maps, the study aims to assess how generative AI technologies might be used to address business difficulties, streamline procedures, and foster creativity in the creation of new products and services as well as customer interaction.

Keywords: Design Thinking, Empathy Map, Small Business, Generative AI.

INTRODUCTION

Generative AI is positioned to catalyze the upcoming surge in productivity. Generative AI platforms like ChatGPT, GitHub Copilot, Stable Diffusion, and similar innovations have ignited the imagination of individuals worldwide. The ease of use and ability to have a conversation with the user enables it usage by wide range of stakeholders. However, the rapid pace of development in generative AI technology is adding complexity to this task.

This is just the outset of a journey to grasp the potential, depth, and capabilities of generative AI. Generative AI (GenAI) has a potential in reshaping the work process, augmenting the capabilities of individual workers through the automation of specific tasks.

The value created by generative AI for the business is over and above the value created by analytics and other AI models.

1. The major benefits of GenAI for business includes:
2. Reduced need for hands-on employee involvement.
3. Assistance and quality assurance for tasks driven by employees.
4. Improved user experiences
5. Accelerated project delivery times.
6. Solutions specific to industries such as pharma, banking, manufacturing etc.

As numerous business proprietors grapple with grasping the implications of artificial intelligence (AI) for their enterprises, significant proportion of small businesses have adopted AI tools, leading to substantial enhancements in efficiency and annual savings of money. There are quite a good number of AI tools such as ChatGPT, Dall-E2, Chatspot, Zoho Zia, Upmetrics, Otter etc. which can be used by small business owners to enhance their productivity, profitability, and competitiveness. The recent upsurge in the adoption of AI tools can be attributed to the tight labor market especially after COVID-19 (Forbes, 2023a). 83% of the small business owners plan to invest in AI (Small Business and Entrepreneurship Council, 2023).

The choice of specific AI tool depends on budget, specific business requirements, ease of use, scalability, and its ability to integrate with current systems. With the continuous evolution of natural language processing models, generative AI tools are poised to become increasingly robust and precise. This technology is being embraced by a growing number of tools and is being utilized across various industries and specialized applications. Recent survey indicates that AI is not for large businesses anymore (Forbes, 2023b). There is a strong association between small business using AI and its success.

For solo entrepreneurs, GenAI tools have the capability to aid in tasks that are time-consuming or repetitive, such as crafting captions or product descriptions. Similarly, recording technology can be employed to capture meeting notes and generate call transcriptions. This paper tries to explore the usage of GenAI by small businesses to identify the pain points and suggest ways to promote its usage.

Theoretical Framework

Generative AI consists of subsets of artificial intelligence techniques and algorithms for generating new ideas or content based on the inputs data it was trained on. Unlike traditional AI models that are used for prediction, generative AI models focus on creating new content such as text videos, images, and audio. The models can process large and unstructured data with ease. Generative AI models can be applied to various aspects of business which can include:

1. Content generation for storytelling, art, and music.
2. Text generation for tasks
3. Image synthesis
4. Drug discovery and molecular design.
5. Designing games and virtual world generation

Generative AI can offer numerous benefits for small businesses across various industries. Here are some ways small businesses can leverage generative AI:

1. Content Creation for marketing: Small businesses can use generative AI to create engaging content for their websites, social media platforms, and marketing materials. AI-powered tools can generate blog posts,

product descriptions, social media posts, and even video scripts, saving costs and time and increasing effectiveness. There exist 63 potential applications for generative AI spanning 16 business functions, with the capacity to yield total economic benefits ranging from \$2.6 trillion to \$4.4 trillion annually when deployed across diverse industries. (McKinsey, 2023).

2. Design and Creativity: Generative AI can assist small businesses in generating designs for logos, branding materials, product packaging, and website layouts. These tools can help create visually appealing and unique designs tailored to the business's brand identity.

3. Customers Data Analysis: To meet the specific needs of the customer, generative AI can help small businesses personalize their products and services according to their requirements. This could include personalized recommendations, product configurations, or targeted marketing campaigns.

4. Chatbots and Customer Service: Small businesses can implement AI-powered chatbots to provide round-the-clock customer support. Generative AI can train chatbots to understand and respond to customer inquiries, resolve common issues, and provide relevant information, enhancing the overall customer experience. A greater portion of customer inquiries can be automated through Generative AI except for a few inquiries that necessitate the assistance of a human agent. Generative AI can reduce the time required for a human sales representative to respond to a customer by offering real-time assistance and suggesting subsequent actions.

5. Generative AI enables the instant translation of mass email campaigns into multiple languages for specific audiences. This, in turn, enhances customer value, conversion, and retention over the long term. The customer's preferences, behavior, and purchase history can be analyzed using GenAI to suggest suitable products and services to him. This facilitates sales of e-commerce companies through increased website conversion rates.

6. New Product Development and Prototyping: Generative AI can assist small businesses in product development by generating prototypes and design iterations based on specified criteria and constraints. This can streamline the product development process and help businesses bring new products to market more efficiently. For the industries such as life sciences and chemical industries, GenAI facilitates the process of developing new drugs and materials.

7. Data Analysis and Insights: Generative AI algorithms can analyze large datasets to identify patterns, trends, and insights that can inform business decisions. Small businesses can use these insights to optimize operations, improve marketing strategies, and identify new opportunities for growth. The recent use cases of generative AI exclude numerical and optimization applications (McKinsey 2023).

8. Virtual Assistants and Administrative Tasks: Small businesses can leverage generative AI to automate administrative tasks such as scheduling appointments, managing emails, and organizing documents. Virtual assistants powered by AI can help increase productivity and efficiency within the organization. Generative AI can assist knowledge workers in scanning the corporate libraries stored in natural language for gathering information which they can fine tune to their requirements. This augmentation can help in accelerating the productivity of these workers.

9. Coding assistant: GenAI will help reduce the expenditure on software engineering to the extent of 20% to 45%. This impact could result from the time saved in routine tasks such as drafting initial code, correcting, and refactoring code, conducting root-cause analysis, and generating new system designs (McKinsey, 2023). There are evidences that use of Microsoft Github increased the efficiency of software developers by 56%.

10. Language Translation and Localization: For small businesses operating in global markets, generative AI offers language translation and localization services to surmount language obstacles and extend their reach to a broader audience. These tools can help translate content accurately and efficiently, enabling businesses to expand their reach internationally.

Thus, generative AI presents numerous opportunities for small businesses to improve efficiency, enhance customer experiences, and drive innovation across various aspects of their operations (for details see Table 1). By leveraging these technologies effectively, small businesses can gain a competitive edge in today's dynamic marketplace (Rawindaran et al., 2021).

Fintech companies are using AI for digital financial inclusion in the areas related to risk detection, information asymmetry, customer support, helpdesk, and fraud detection (Mhlanga, 2020). Zeiss developed a proof-of-concept (PoC) generative AI (GenAI) application to respond promptly to customer inquiries related to available treatments.

To ensure that that the information provided by GenAI to customers is accurate, current and pre-approved, the application is created using their own approved material which

are validated regularly (BCG, 2023). GenAI has a significant role in building more resilient domestic capabilities for electronics manufacturing industry (Fernandes, 2023).

TABLE 1 INDUSTRY SPECIFIC APPLICATIONS OF GENERATIVE AI	
Name of the Industry	**Usage of GenAI**
Banking	Customer emergency interactive response, Customized retail banking products, documentation gaps and updates, wealth management.
Retail and consumer goods	Consumer research, Customer service, supply chain and logistics, personalized products and services, content creation
Pharma and medical industries	Research & Development, drug discovery, contract formation, customer records and documentation
IT Industry	Neural network designing, chip designing, creating algorithms, coding, translate programming languages
Automotive	Material science, create lighter designs to improve fuel efficiency,
Aerospace and Defense	Product design, material science
Media and Entertainment	Create videos and music, images, storyboards, text to image creation, high resolution images, content management, create highlight reels
Electronics	Production of printed circuit boards, visual quality inspection
Energy	Prediction of solar and wind output, distribution and dissemination of electricity, load balancing, prediction of energy market price and volatility
Travel and Tourism	Facial Recognition and verification at airports, verification of traveler's identity

Source: Authors Findings.

AI driven tools can be used to build an effective B2B platform to automate the market research and provide an intuitive e-commerce interface (Coltey et.al. (2022). Further, AI can alter the traditional human-centric sales process by turning the large amount of data into information for knowledge creation and management in B2B sales (Paschen et.al. 2020). AI can help small businesses in locating the right foreign markets for expansion (Fish & Ruby, 2009).

AI powered chatbots are frequently embedded in marketing strategies and customer service as they add value to business especially small family businesses (Rizomyliotis et.al. (2022)). AI powered conversation agent, speech based, or text based, uses human language to interact with customers (Danckwerts et al., 2019, Kumar et al., 2020, Lin et al., 2022). However, many customers had reservations while using chatbots due to perceived risk and misunderstanding of input (Danckwerts et al., 2019, Sheehan et al., 2020, Trivedi, 2019. Small businesses tend to keep strong personal relations with their customers and the use of chatbots may affect their customer attachment.

There are instances of shorter job completion times and even distribution of work by use of Kubernetes by small businesses in terms of latency, service quality, energy efficiency, data integrity and scalability (Mantri & Mishra, 2023). The integration of AI and Internet of things (AIoT) can help in farm management by addressing the challenges faced by small-scale poultry farms to improve overall productivity and quality (Gandhi, 2023). Small businesses can use RFID framework for better customer services, knowing their shopping history, inventory management and improved store design (Ramgir, 2019). AI tolls can disrupt small businesses to increase their value in the marketplace and ultimately add value and profitability (Sabarre et.al.2023)

This indicates that generative AI is ready to revolutionize roles and enhance performance in areas including finance, sales and marketing, customer service, research & development, and software development. From banking to life sciences, GenAI has the potential to emancipate trillions of dollars in value to the global economy (McKinsey 2023).

The enthusiasm surrounding this technology is tangible, and initial trials are convincing. However, achieving the full benefits of technology will require time and efforts in managing challenges and risks of generative AI. There is a strong need to improve the skills and capabilities required by the workforce to use GenAI for business advantage. Further, the content created by Generative AI should be reliable to ensure adherence to quality standards (Pinar & Michael, 2020).

Furthermore, there is an increased need to address security vulnerabilities and privacy risks. This challenge is more crucial for industries such as pharma where the utilization of clinical images and medical records by Generative AI may increase the risk of protected health information leakage, potentially leading to violations of regulations mandating the companies to safeguard patient privacy. Another major challenge associated with the use of gen AI is copyright issues. Bringing data together from disparate systems is another major issue with AI (Edelman, 2023).

This study aims to achieve the following objectives:

1. To assess small company stakeholders' present understanding and perspectives on generative AI technology.
2. To determine the potential, problems, and difficulties small businesses face when implementing GenAI into their day-to-day operations.
3. To assess small firms' preparedness to adopt and use generative AI technologies considering their current capabilities and resources.

METHODOLOGY

Design thinking entails a systematic, non-iterative approach to comprehending users, questioning assumptions, reframing problems, and generating innovative solutions. (IDF, 2022). Applying design thinking is pivotal in integrating generative AI into small businesses, ensuring both technical feasibility and alignment with genuine user needs and business objectives. The application of design thinking to generative AI within small business contexts includes seven stages:

1. Empathize: Understanding Business Needs and User Pain Points
Initiate by empathizing with small business owners to grasp their requirements, challenges, and pain points. Leverage methodologies such as interviews, surveys, and observations to glean insights into how generative AI could augment processes or unveil new opportunities.
2. Define: Reframing the Problem
Based on garnered insights, redefine the specific problem or opportunity apt for generative AI intervention. Ensure articulation of the problem focuses on generating value for the business and its stakeholders.
3. Ideate: Brainstorming AI Solutions
Cultivate a culture of creativity and collaboration among team members to brainstorm a myriad of ideas on how generative AI could address the identified problem or exploit available opportunities. Encourage exploration of various approaches and potential AI applications.
4. Prototype: Developing AI Prototypes
Handpick promising AI concepts from the ideation phase and translate them into prototypes to assess their feasibility and potential impact. Employ tools and platforms conducive to swift prototyping of generative AI models, leveraging existing libraries and frameworks where feasible to expedite development.
5. Test: Gathering Feedback and Iterating

Subject the AI prototypes to testing with end-users and stakeholders to solicit feedback on usability, effectiveness, and alignment with business objectives. Iterate on the prototypes based on received feedback, effecting adjustments and enhancements to better address user needs and rectify identified issues.

6. Implement: Deploying AI Solutions

Upon validation of a viable generative AI solution through development and testing, prepare it for seamless integration within the business ecosystem. Collaborate closely with IT and operations teams to ensure the smooth assimilation of the AI solution into existing systems and workflows.

7. Monitor and Evaluate: Measuring Impact and Iterating

Continuously monitor the performance and impact of the deployed AI solution, collecting data on key metrics such as efficiency gains, cost savings, and user satisfaction. Utilize the accumulated data to pinpoint areas for further improvement and optimization, iterating on the AI solution to enhance its effectiveness over time.

Throughout this iterative process, maintaining a user-centric approach is paramount, with an unwavering focus on accommodating the needs and experiences of both employees and customers.

By adhering to design thinking principles in the development and implementation of generative AI within small businesses, the likelihood of success is heightened, facilitating the maximization of value derived from AI technologies. In this study, we focused on the first stage of design thinking i.e. empathize (Nina R et al., 2023).

The first stage of Design Thinking is empathizing with end-users. Small business owners are actively engaged in understanding challenges, goals, and expectations. The empathy map delivers a holistic understanding of the thoughts, feelings, needs, pains and gains experienced by small business owners regarding the use of Generative AI for decision-making, risks mitigation, effective management, and to unlock new opportunities for sustainable business solutions. By empathizing with the perspective of small business owners, business can tailor the approach to use or implement Generative AI solutions to address key concerns, alleviate pain points, highlight gains, and deliver effective solutions to user persona.

We followed the following steps to create an empathy map for our study:

Step 1: Identification of Target group/User Persona: After defining the objectives of the study, we identified the target group for the study. Next, we clarified the user personas that aim (involved in or impacted by the integration of Gen AI in small businesses) to use generative AI in small businesses.

Step 2: Primary data collection: We have conducted semi structured interviews and filled survey form with user persona to glean insights into their experiences, pain points, and aspirations related to business operations and AI integration. Then we employed open-ended inquiries and active listening strategies to extract profound insights into user personas' perspectives. The interview questions aim to unearth valuable insights into the perspectives, experiences, and requirements of small business owners involved in the integration of Generative AI in small businesses (refer Annexure 1).

Step 3: **Data Analysis:** After soliciting responses related to their thoughts, emotions, actions, and needs, as well as their underlying motivations, a comprehensive empathy map is developed to assess the potential pain and gain points for the users of generative AI in small businesses. Further, commonalities and disparities among users' experiences and viewpoints were analyzed.

Step 4: **Create Empathy Map:** Next, we developed a visual representation of the empathy map based on the findings derived from empathy interviews and observations. The empathy

map is segmented into different categories delineating stakeholders' thoughts, emotional experiences, articulations, and engagements regarding Generative AI in small businesses. Four quadrants corresponding to the identified categories:

1. Say: Capture users' statements, opinions, and verbal expressions.
2. Think: Explore users' beliefs, attitudes, assumptions, and considerations.
3. Feel: Reflect users' emotional responses, desires, fears, and aspirations.
4. Do: Document users' actions, behaviours, interactions, and responses.

After this we filled each quadrant with specific insights, quotes, or observations derived from the data analysis.

Step 5: Refine and Iterate: After data analysis, we reviewed the empathy map and considered integrating any additional data or insights on the use of generative AI in small businesses. At this stage, we refined and iterated the empathy map to ensure the accuracy that it accurately mirrors users' experiences and perspectives.

Step 6: Utilize Empathy Map for Decision-Making: After refining and iterating an empathy map, we were sure about the accuracy of the map. Next, we could leverage the empathy map as a tool to guide decision-making for the use of Generative AI in small businesses. Implications of the study reflect on how the insights (into users' experiences, thoughts, emotions, and actions regarding the integration of Generative AI in small businesses) encapsulated in the empathy map can steer the development of user-centric solutions and effectively address users' needs.

ANALYSIS AND DISCUSSION

Design thinking helps in dealing with wicked problems (term coined by Horst Rittel to describe problems that are multidimensional and extremely complex) by disrupting previous assumptions, developing "good enough solutions and transforming firms to ensure resilience (Cankurtaran & Beverland, 2020). Design thinking can help in solving problems which are complex, multidimensional and cannot be solved by data alone. Applying GenAI by small business requires lot of understanding by the entrepreneurs on its usage and challenges. Next, we analyzed the responses received from user persona for four categories:

Category 1: Users' Say: Generative AI is becoming a more attractive tool for small firms looking to improve customer happiness and gain a competitive advantage. A Donald's Bakery bakery proprietor described the revolutionary possibilities of generative AI in his business practices. To begin with, the technology has the potential to completely transform creativity and innovation by producing previously unimaginable cake shapes, flavors, and combinations. This capacity exceeds the bounds of conventional baking, guaranteeing that products stay appealing to clients and fresh. Furthermore, through the analysis of individual tastes and dietary requirements, generative AI may personalize client experiences. Since each cake becomes a distinct representation of the consumer's preferences, personalization not only increases customer satisfaction but also encourages loyalty.

Generative AI has the potential to improve personalization and innovation in small businesses while also increasing operational efficiency. AI-powered automated technologies can develop recipes, producing content, and carrying out focused marketing efforts. Companies such as Donald's Bakery can better manage their resources by automating these operations and concentrating on their core competencies, which foster innovation and growth. Furthermore, several entrepreneurs emphasize how generative AI might revolutionize

analytical work. Significant improvements in data processing and interpretation are made possible by generative AI when used properly and with the right information. For example, AI reduces the need for human interaction in voice-to-text and call summarization projects, increasing the efficiency and accuracy of data-driven tasks.

Even with the clear advantages, stakeholders and small business owners could be hesitant to incorporate generative AI. The apparent difficulty and related expenses of implementing new technology are frequently the source of concerns. These interested parties are looking for precise and unambiguous justifications for how generative AI might improve their business processes. Some voice scepticism over the hype surrounding AI, stressing the need for careful management and use. For example, generative AI is essential to improving operational monitoring in the automobile industry. Automated systems could quickly identify and notify any problems on a variety of devices, guaranteeing quick fixes and reducing downtime. In conclusion, while small businesses recognize the potential of generative AI to innovate and streamline operations, they also approach its integration with a mix of enthusiasm and caution. Clear communication of benefits tailored to specific business needs is crucial in assuaging concerns and garnering support for adoption. As generative AI continues to evolve, its role in enhancing creativity, personalization, and operational efficiency promises to reshape how businesses engage with customers and optimize internal processes for sustainable growth.

Category 2: Users' Think: According to study results, small business owners and stakeholders are optimistic about the incorporation of generative AI into their operations. They believe that generative AI may dramatically improve business efficiency in a variety of areas, including production, marketing, customer development, strategic planning, operations, and financial management. Additionally, they see AI as a tool for automating monotonous processes, freeing up crucial time and resources. Furthermore, they believe generative AI can provide novel answers to real-world corporate difficulties while also improving decision-making processes.

One respondent highlighted the revolutionary effects of generative AI on customer engagement, product development, and workflows, attributing it to boosting productivity, creativity, and competitive advantage in enterprises.

The strategic advantages of generative AI adoption were emphasized by a bakery entrepreneur, especially in terms of differentiating their products in a crowded market. Through work automation, they hope to increase productivity and operational efficiency while introducing novel and inventive products by utilizing AI.

Additionally, they hope to increase consumer pleasure and engagement by providing individualized experiences based on specific preferences. Another respondent also mentioned their favorable experience with generative AI, emphasizing its function in automating activities and stimulating innovation in crucial processes like data analysis and content development.

Despite their enthusiasm, small business owners express reservations about the challenges and costs of incorporating generative AI into their operations. These concerns highlight the importance of careful consideration and clear communication about the practical benefits and feasibility of incorporating AI technologies efficiently.

Category 3: Users' Feel: Some respondents expressed concern about the learning curve and uncertainty connected with implementing new technology in their organizations, pointing out that the entire impact has yet to be thoroughly assessed. Others, on the other hand, are convinced that the results will be positive. For instance, a chicken farm business owner highlighted both the pros and concerns of using generative AI in their operations.

For them, generative AI is an important tool for data-driven decision-making that makes it easier to gather and examine large amounts of data from the chicken farm. This

makes it feasible to make better decisions about illness diagnosis, resource management, and production patterns. Furthermore, they believe AI can automate processes like environmental management, feed optimization, and bird health monitoring, which could greatly improve operational efficiency and save personnel expenses. Despite these benefits, small business owners are concerned about the dependability and accuracy of AI services, particularly in important areas such as health monitoring and market demand forecasting. They emphasize the need of guaranteeing consistency in technological performance and building trust in the accuracy of AI-generated findings.

In conclusion, while some respondents are concerned about the challenges of implementing new technologies, others are hopeful about the potential benefits of generative AI in enhancing decision-making processes and operational efficiency inside their organizations.

Category 3: Users' DO: Different approaches were given by small business owners on how to integrate generative AI into their operations. To evaluate their applicability and functionality, they advise beginning with playing with currently available AI-powered products like recipe generators, design platforms, or marketing solutions. Working with tech businesses to create custom AI solutions that address certain company goals and challenges is another strategy. Furthermore, they support a phased deployment strategy, starting with a narrow focus—for example, customized cake recommendations—and gradually broadening it as resources and experience increase. Furthermore, small firms and stakeholders learn about the potential benefits of generative AI from industry experts, internet articles, and publications. They aggressively seek knowledge and resources by attending webinars, workshops, and speaking with industry professionals. Success examples and case studies from other small enterprises that have implemented generative AI serve as useful benchmarks for examining its potential benefits and limitations. Respondents emphasized the importance of usability in ensuring that AI products and services satisfy users' needs and expectations. They highlight intuitive interfaces, clear instructions, and seamless interactions as important components in improving usability. Prioritizing usability not only increases user pleasure but also improves operational efficiency, resulting in long-term success for enterprises (Gandhi, 2023).

The usability of generative AI technologies is influenced by multiple factors. The ease of adoption of current technology and the accessibility of the required technological infrastructure; business requirements and tasks that AI solutions can handle. Financial factors for both the initial investment and continuing upkeep. Availability of pertinent data needed for efficient training and application of AI models. One small company owner in the cooler motors sector, for example, described how they use generative AI for quality control. AI inspects photos taken during the production process to find anomalies and flaws in cooler motors, guaranteeing that the final product satisfies quality requirements prior to shipping. By lowering warranty claims and rework, this strategy improves customer happiness and operational effectiveness. Users in the target category realize generative AI's potential usability benefits in a variety of business domains. They recognize its capacity to automate tasks, produce insights, and spark innovation in data analysis, content creation, and product development. Businesses may greatly increase their productivity and market competitiveness by embracing AI to provide creative solutions and streamline procedures.

Next, a comprehensive empathy map is developed to assess the potential pain and gain points for the users of generative AI in small businesses. Comprehending the empathy map for small business owners regarding the adoption of Generative AI entails acknowledging their viewpoints, concerns, motivations, and aspirations. Based on survey results, pain points and gain points are identified from the empathy map. The empathy map

indicates that small business owners and stake holders may encounter challenges stemming from resource limitations, such as budget constraints and a deficit of expertise in AI technology. Additionally, apprehensions regarding potential disruptions to their current workflows and the fear of trailing behind competitors could trigger substantial anxiety.

Further, the potential gain points of generative AI in small businesses were also identified from the empathy map. In Small businesses, target group may encompass improved decision-making capabilities, heightened efficiency, enhanced customer experience and competitive edge in the market. Also, they are optimistic regarding the potential for discovering fresh avenues for growth and innovation through the utilization of Generative AI.

Table 2 illustrates major pain and gain points that are identified from the empathy map that explores the role of generative AI in small businesses.

Table 2 PAIN AND GAIN POINTS- USE OF GENERATIVE AI IN SMALL BUSINESSES	
Pain Points:	**Gain Points:**
Complex in Nature	Efficient and Effective
High Cost (Set-up and Maintenance)	Innovative solutions
Data Security	Competitive Advantage
Resistance to Change	Decision-making
Lack of Knowledge	Scalability

Source: Authors analysis.

Out of total 25 respondents, majority of them voted positively (on Likert scale, 1 = Not effective at all, 5 = Extremely effective; 95.8% provided a rating of 4) for effectiveness of generative AI in small business. Therefore, the study identified the potential pains and gains to the target group based on survey results and empathy map.

For small business owners, generative AI integration and execution present substantial challenges. The availability of sufficient technical infrastructure is one of the key conditions that determines how useful AI is in this situation. Determining the viability of AI applications requires evaluating how well present technology supports them. The high setup and maintenance costs of generative AI systems present another difficult obstacle. Affordability becomes a crucial issue because small enterprises often have tight budgets. It is important to carefully assess the financial viability of adopting AI tools before making the initial investment and continuing costs of maintenance, which frequently exceed budgetary allotments.

One of the top concerns for small firms considering AI deployment is data security. The widespread concern is that confidential customer and company data may be compromised by breaches or leaks.

The possibility of inadvertent data exposure because of technical malfunctions emphasizes the necessity of strict data privacy protocols to adequately protect sensitive databases. Adoption of generative AI is severely hampered by reluctance to change, in addition to budgetary and security issues. Many small company owners show a preference for conventional operating procedures and may be wary of artificial intelligence (AI). These concerns may stem from a concern about data security, the loss of jobs, or just a comfort level with the current paper-based procedures. It will need aggressive initiatives to inform and convince stakeholders about the advantages of AI and reassure them about safety precautions to overcome this opposition. Proactive measures are required to educate and persuade stakeholders about the benefits of artificial intelligence and reassure them about safety measures to overcome this reluctance.

Generative AI has a great deal of promise to improve small enterprises' operational effectiveness and competitiveness but putting it into practice will present several difficult obstacles. To successfully integrate AI, small business stakeholders must be equipped with

the information and skills needed through focused educational programs, financial prudence, strong security measures, proactive change management, and strategic planning.

Generative AI has demonstrated the ability to greatly improve the productivity and performance of small enterprises by exploiting its automation and optimization skills (Edleman & Abraham, 2023). Members of the target group stated that, "Generative AI has enormous potential for improving usability within our business." It automates processes, generates insights, and promotes innovation in a variety of fields, including data analysis, content creation, and product development. Its ability to generate creative ideas and streamline procedures is positioned to significantly improve our efficiency and competitiveness in the market." Furthermore, generative AI helps small firms stimulate innovation by creating new ideas, designs, and creative solutions using design thinking techniques. Unlike traditional methodologies, which frequently limit innovative solutions to difficult business situations, generative AI creates new opportunities for creativity.

Strategically integrating generative AI gives small enterprises a competitive advantage. Businesses can differentiate themselves in competitive marketplaces by making decision-making processes more efficient, improving product and service offerings, and using customer-centric approaches. Generative AI also provides small firms with significant insights based on detailed data analysis. This capacity enables firms to make informed, data-driven decisions, recognize emerging trends, discern patterns, and comprehend crucial elements influencing their operations. Furthermore, the scalability provided by generative AI improves small enterprises' ability to run and expand their operations efficiently. The technology lets firms to efficiently handle increasing amounts of work, even with limited resources, promoting long-term growth and scalability. The implementation of generative AI provides small firms with significant tools for improving operational efficiency, driving innovation, gaining competitive advantages through informed decision-making, and achieving scalable growth in changing market situations.

Next, Based on the interview results, the empathy map below is created to address the role of generative AI in small firms (Figure 1). Each coin has two sides, and the use of generative AI presents both potential benefits and problems for small business owners. The empathy map is created first, then revised after including any fresh data or insights into the application of generative AI in small enterprises. At this point, we revised and iterated the empathy map to ensure that it appropriately reflected the users' experiences and opinions.
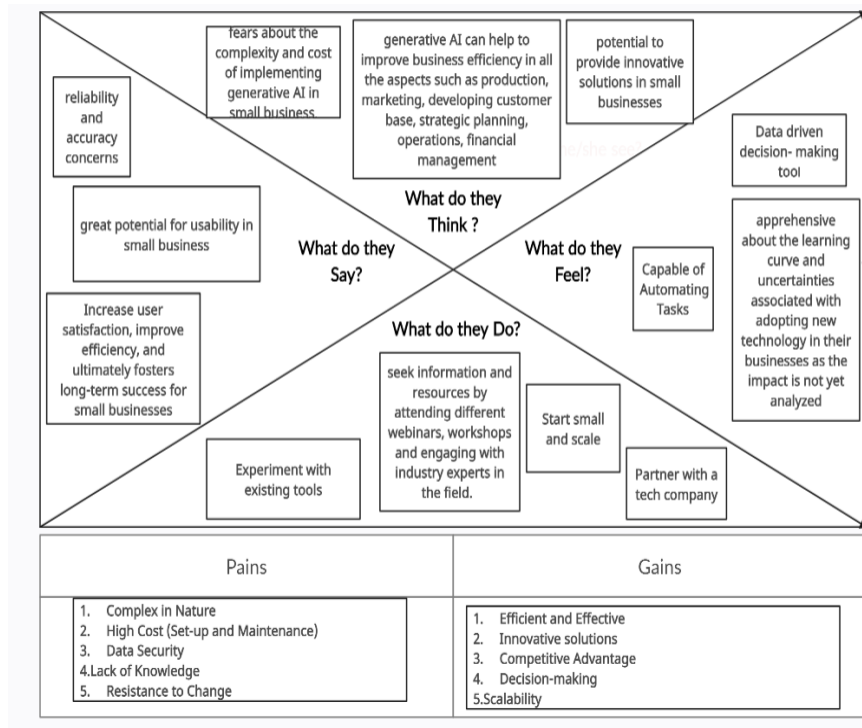
Source: Authors calculation.

FIGURE 1
EMPATHY MAP – USE OF GENERATIVE AI IN SMALL BUSINESSES

Utilize Empathy Map for Decision-Making

Through the utilization of an empathy map, decision-makers can deepen their grasp of small business owners' viewpoints, worries, and ambitions concerning the integration of generative AI into small businesses. This understanding facilitates decision-making by identifying potential obstacles or opportunities for successful implementation. Furthermore, it enables decision-makers to customize communication strategies and support mechanisms to address users' needs and concerns effectively.

CONCLUSION

Firstly, the paper is poised to significantly advance the theoretical understanding of how small businesses can proficiently deploy generative AI technologies. It provides insights into the factors influencing the adoption and usability of such technologies. Secondly, through the application of a design thinking approach, the paper has the potential to offer valuable insights into how small businesses can seamlessly integrate generative AI solutions into their operations and management. This contribution would enrich discussions on the theoretical framework surrounding the intersection of design thinking and strategies for implementing AI. Thirdly, the inclusion of empathy maps by providing pain and gain points signifies a deliberate endeavor to comprehend the needs and experiences of users within the domain of generative AI solutions in small businesses. Fourthly, small businesses can leverage the findings of the paper to strategically implement generative AI technologies. By embracing a design thinking approach, small business owners can deepen their understanding of user needs and tailor AI solutions to effectively address specific pain points or challenges. Fifth, the practical utility of the empathy map tool equips small businesses with a framework to empathize with their users and develop AI solutions that proficiently meet their needs. This

user-centric approach can result in more successful AI implementations and enhanced user experiences.

To conclude, the adoption of generative AI can empower small businesses to sharpen their competitive edge through innovation. By harnessing AI to elevate their offerings—be it products, services, or processes—they can distinguish themselves in the market and better cater to customer demands

Annexure 1: The four quadrants of empathy map require responses on what users think, what they feel, what they do and what they say.

To capture what users Think about using GenAI for their business, the following questions were asked:

Q1. When encountering information about generative AI, what are your initial impressions?
What considerations come to mind when pondering the potential applications of generative AI within your small business?
Q2. How do you perceive the potential impact of generative AI on the efficiency and productivity of your business processes?
Q3. What reservations or concerns do you harbor about incorporating generative AI into your operations?
Q4. In what ways do you envision generative AI benefiting your small business in the long term?

To capture what users Feel about using GenAI for their business, the following questions were asked Feel:

Q1. How do you feel about the possibility of implementing generative AI in your small business?
Q2. What emotions arise when considering the opportunities for automation and creativity enabled by generative AI?
Q3. Do you experience any apprehensions or anxieties when contemplating the adoption of generative AI?
Q4. Do you feel confident in your ability to understand and utilize generative AI technologies for your business?
Q5. How do you anticipate your emotions evolving as you gain further insights into generative AI and its potential impact on your business?

To capture what users Say about using GenAI for their business, the following questions were asked:

Q1. What discussions do you have with your colleagues or employees regarding the integration of generative AI into your small business?
Q2. How do you convey your plans or concerns about adopting generative AI to stakeholders such as investors or partners?
Q3. Are there specific questions or uncertainties you voice when seeking information or advice about generative AI?
Q4. How do you articulate the potential benefits or risks of generative AI to your customers or clients?
Q5. In what ways do you express your vision for the future of your small business with generative AI as a component of your strategy?

To capture what users Do about using GenAI for their business, the following questions were asked:

Q1. What steps have you taken to explore or research generative AI and its suitability in small businesses?
Q2. Have you conducted any experimental trials or proof-of-concepts involving generative AI within your business?
Q3. How do you allocate resources or prioritize tasks related to the integration of generative AI into your operations?
Q4. Have you made any adjustments to your business strategy or workflows in anticipation of implementing generative AI?
Q5. What are your planned next steps in the process of adopting generative AI, and what factors guide your decisions?

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