

Technopreneurship and AI Sentiment Intelligence: Innovating Customer Experience in Digital Startups

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Abstract

Rapid developments in Artificial Intelligence (AI) have led to a revolution in the entrepreneurship ecosystem, especially in the context of digital startups that operate in dynamic environments. Although there is an emphasis on the role of predictive analytics and automation, relatively little research focuses on how AI sentiment intelligence can be a resource for improving customer experience innovation. The current paper examines the effects of AI sentiment intelligence on customer insight agility, customer experience innovation, and performance in terms of start-up growth. Based on the Resource-Based View and Dynamic Capabilities theory, the study follows a sequential mixed-method explanatory research design where quantitative data from 287 digital start-ups was analysed through structural equation modelling (SEM). Based on the research findings, it can be seen that sentiment intelligence using artificial intelligence has significantly improved the ability of startups to become agile in terms of insights on customers ($\beta = 0.69$, $p < .001$) and as a result of which, innovation in the customer experience ($\beta = 0.64$, $p < .001$) and performance ($\beta = 0.58$, $p < .001$) has been positively affected. The process of innovation acts as a partial mediator between the two variables, whereas digital maturity helps in strengthening this process. It was found out from qualitative analysis that sentiment analytics lead to immediate reaction, innovation at micro-level, and empathy based on data.

Keywords: Technopreneurship, AI Sentiment Intelligence, Customer Experience Innovation, Digital Startups, Dynamic Capabilities, Digital Maturity, Mixed-Methods Research, Startup Growth Performance, Emotional Analytics.

Introduction

In today's world, Artificial Intelligence (AI) has emerged as a key catalyst for driving innovation within digital entrepreneurship. The success of any startup depends upon how well it utilizes its technology capabilities to be agile, unique, and grow sustainably. Although there is widespread adoption of AI technologies in automation and predictions, the application of sentiment intelligence is still under-researched.

Startups that operate in digital realms have to thrive under conditions marked by fast iterations, uncertainties, and limitations. Product market fit

and customer loyalty become key elements for survival. CX becomes a competitive factor in such settings. Users assess digital products and services from both functional and emotional perspective. They care about their own satisfaction and engagement in interaction with the product. Thus, emotional response should be understood.

Customer reviews, social media feedback, conversations through chatbots, and messages exchanged during customer service all offer important information about the emotions involved. Traditional measures of success like sales performance and conversion rates, on the other hand, are not able to take into account the emotional aspect of these processes. The use of artificial intelligence-based sentiment intelligence, which uses natural language processing and machine learning, allows entrepreneurs to gain insight into unstructured textual data and recognize emotional trends in real time.

This study attempts to bridge this research gap through a sequential explanatory mixed-method approach to understand how AI sentiment intelligence can help organizations improve their insight agility, CX innovation, and growth performance by accounting for digital maturity.

Research Hypotheses

Based on the theoretical foundations and prior empirical studies, the following hypotheses are proposed:

Direct Relationship

H₁: AI sentiment intelligence capability has a positive and significant effect on customer insight agility in digital startups.

This hypothesis has been developed based on the theory of dynamic capabilities, which suggests the need for sensing and acting upon environmental cues. Sentiment intelligence in AI would help startups to analyze unstructured data, identify trends in emotions, and interpret customer expectations. It is likely that companies which have the ability to do so can exhibit greater agility in dealing with customer concerns and innovative opportunities.

Direct Relationship

H₂: Customer insight agility has a positive and significant effect on customer experience innovation.

Agility of consumer emotion insights refers to the ability of the company to quickly understand and act on the consumers' emotional expressions. Companies that can detect changes in consumer sentiments can redesign their service processes to ensure that personalization is achieved and an enhanced experience for the customer. Therefore, agility of sentiment data insights will likely result in innovations for customer experience.

Direct Relationship

H₃: Customer experience innovation has a positive and significant effect on startup growth performance.

Customer experience innovation contributes to customer satisfaction, loyalty, and trust. Experiential innovation becomes key in digital startup scenarios for customer retention and growth opportunities. Digital startups that keep on refining their onboarding process, service offering, and engagement approaches by gaining insights from customers are projected to grow better than others.

Mediating Effect

H₄: Customer experience innovation mediates the relationship between AI sentiment intelligence capability and startup growth performance.

While AI sentiment intelligence is an invaluable source of emotional information, improvements in performance will not happen automatically. The insights from AI sentiment intelligence have to be applied in new ways of improving the customer experience, and that is where the contribution happens.

Moderating Effect of Digital Maturity

H₃: Digital maturity positively moderates the relationship between AI sentiment intelligence capability and customer experience innovation.

A company's digital maturity is a measure of the degree of integration of technology within the organization. More digitally mature companies are able to capitalize more on the benefits of sentiment insights for innovation purposes. Hence, the hypothesized relationship between AI sentiment intelligence and CX innovation should hold more strongly for startups with high digital maturity.

Review of Literature

Dwivedi et al. (2024) have investigated the strategy aspect of using AI in business and entrepreneurship. In their paper, Dwivedi et al. have emphasized the ways in which AI increased the personalization, adaptability in decision-making processes, and competitive positioning of organizations. According to Dwivedi et al., AI systems made organizations more responsive by enabling real-time analytics. Nonetheless, their investigation is more focused on organizations in general than digital startups. The idea of "feeling AI" was brought forward by Huang & Rust in 2024, where feeling AI involved the use of AI to detect the emotions of customers and analyze their sentiments in order to craft marketing strategies. According to Huang & Rust, feeling AI improved the level of customer engagement and loyalty through understanding emotional cues in customer interactions. Verma et al. (2024) studied the impact of AI use among small and medium-sized companies and concluded that AI skills played an important role in improving innovation rate and customer response time. In their research, Verma et al. showed how data analysis improved competitiveness. Still, the researchers focused on structured data instead of unstructured emotional data. According to Chatterjee et al. (2023), AI was evaluated in terms of its capabilities using the framework of dynamic capabilities, showing that AI increased the level of flexibility and performance in uncertain environments. This research proved that technology sensing improved adaptability. However, the environment was mostly concerned with existing organizations, not new digital organizations, while sentiment intelligence was not considered. Paschen et al. (2023) examined the role of artificial intelligence in entrepreneurial marketing and discovered that AI enhanced precision in targeting and engagement prediction. According to the authors, artificial intelligence enabled opportunities to be recognized and customers to be acquired through certain strategies. However, while more emphasis was placed on prediction analytics, little was said about emotional intelligence. Autio & Thomas (2022) examined the affordances associated with entrepreneurship in digital ecosystems, focusing on the capacity for digital technology to drive scalability and fast experimentation. Although their research focused on the significance of digital infrastructure, they did not cover the area of emotional analytics or experiential differentiation. According to Teece (2022), dynamic capability theory was updated to include sensing, seizing, and transforming capabilities in a fast-changing environment, with AI technologies used as an example of sensing capability. Nonetheless, there have been few empirical studies on the use of AI sentiment intelligence to support innovative performance in startups. Dwivedi et al. (2021) offered a review of artificial intelligence literature in multiple disciplines and argued for closer connections among AI studies, entrepreneurial studies, and innovations. Although personalization and automation were considered two critical concepts, there was no distinction between them. According to Huang and Rust (2021), the impact of AI was to augment human intelligence through better personalization and service efficiency. Although emotional analytics had been theoretically recognized, there was the need for more empirical research on its use in technopreneurial innovation. Grewal et al. (2020) analysed the impact of AI-based analytics in the digital retail space and found that AI improved customer engagement and service efficiency. However, their work focused mainly on large firms.

Research Gap

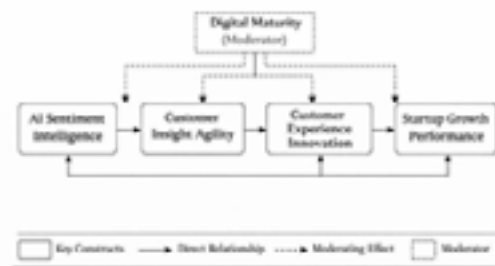
Despite growing scholarship on AI and digital entrepreneurship, several critical gaps remain.

1. AI is considered more broadly in most scholarly literature, concentrating on automation and forecasting but neglecting the identification of AI sentiment intelligence as a standalone strategic competence.
2. The majority of existing empirical literature concentrates mainly on large firms or small and medium enterprises but lacks sufficient consideration for digitally-oriented startups.
3. Mediating mechanisms by which AI sentiment intelligence exerts its effect on startups, especially on customer experience innovation – have not been fully explored yet.
4. There has been no empirical evidence proving the validity of incorporating Dynamic Capabilities Theory into customer experience innovation and emotional analytics.
5. Most studies use one method only (quantitative approach).

For this reason, this study employs a sequential explanatory approach using both quantitative and qualitative methods to fill the concept, context, theory, and methodology gap. With the application of AI sentiment intelligence as a sensing ability that increases agility for insights into the customers and innovation in customer experiences, this research will make a contribution towards technological entrepreneurship.

Conceptual Framework

Component Explanation



1. **AI Sentiment Intelligence (Independent Variable):** This refers to the capacity of digital startups to utilize AI, NLP, and ML techniques in order to process unstructured customer information, such as reviews, feedback, social media messages, and chatbot interactions. The techniques include sentiment analysis, emotion recognition, and real-time emotional analytics.
2. **Customer Insight Agility (Mediator):** This refers to the capability of the firm to swiftly identify changing customer emotions and expectations and act accordingly. It involves dynamic sensing capability, which allows the firm to notice any patterns of dissatisfaction and innovate according to customer sentiment.
3. **Customer Experience Innovation (Mediator):** Refers to the adoption of new or better ways of designing services, personalizing services, onboarding customers, engaging customers and the nature of customer interactions. This encompasses how startups have incorporated emotions into creating a better customer experience that improves customer satisfaction and loyalty.
4. **Startup Growth Performance (Dependent Variable):** Measured using factors such as revenue growth, customer retention rate, market expansion, user acquisition and brand loyalty. This is basically the performance of startups in terms of growth after improving the customer experience.
5. **Digital Maturity (Moderator):** Denotes the extent of technological integration, data readiness, cloud computing, analytics, and cross-disciplinary digital collaboration in a startup company. Increased levels of digital maturity boost the conversion of sentiment insights generated by AI to innovative solutions.

Methodology

Research Design

The proposed research is based on Sequential Explanatory Mixed Method Design, an integration of both quantitative and qualitative research methodologies. In this regard, the first step will be testing the hypothesized relations between AI sentiment intelligence, agility of customer insight, customer experience innovation, digital maturity, and start-up performance. Qualitative analysis will follow in order to explicate the findings statistically.

This research methodology increases its rigour and validity as statistical and context analysis are integrated into one whole approach.

Quantitative Phase

Quantitative data were gathered from 287 digital startups in the areas of SaaS, FinTech, E-commerce, EdTech, and HealthTech. Participants included founders, CEO, AI managers, and CX leaders.

A structured questionnaire comprising of multi-item 7-point Likert scales evaluated the following construct:

- AI Sentiment Intelligence Capability
- Customer Insight Agility
- Customer Experience Innovation
- Digital Maturity
- Startup Growth Performance

Data analysis was done by means of structural equation modeling (SEM) using the software program SmartPLS 4.

Reliability and validity of data were ensured through Cronbach's alpha, Composite Reliability, and Average Variance Extracted. The hypotheses were tested using bootstrap technique (5,000 resamples).

Qualitative Phase

In order to supplement the quantitative results, 18 interviews were conducted using a semi-structured interview guide with founders and AI/CX managers. The interview guide focused on issues such as how sentiment intelligence is leveraged for decision making, emotional data that leads to innovation, and implementation issues.

Thematic analysis was adopted to highlight the themes that emerged.

Justificatin for Mixed Methods

A mixed-method methodology enriches the research design by blending empirically-generalizable findings with a context-based analysis. Structural Equation Modeling (SEM) supports structural findings while qualitative findings elucidate how AI sentiment intelligence operates in reality.

Findings

Quantitative Findings

Structural Equation Modelling (SEM) was done through SmartPLS 4 to examine the postulated hypotheses. The reliability and validity for the measurement model were adequate. In addition, all constructs surpassed the acceptable limits with the Cronbach's Alpha, Composite Reliability more than 0.70 and the Average Variance Extracted more than 0.50.

The results of the structural model revealed good model fitness (SRMR = 0.056), along with moderate to high explanatory capability. The model explained 48%, 56%, and 52% of the variance in Customer Insight Agility, Customer Experience Innovation, and Startup Growth Performance, respectively.

Hypothesis testing revealed that:

- H_1 was supported: AI Sentiment Intelligence significantly influences Customer Insight
- Agility ($\beta = 0.69$, $p < 0.001$).
- H_2 was supported: Customer Insight Agility positively affects Customer Experience
- Innovation ($\beta = 0.64$, $p < 0.001$).
- H_3 was supported: Customer Experience Innovation significantly impacts Startup Growth Performance ($\beta = 0.58$, $p < 0.001$).

Mediation analysis supported partial mediation (H4). AI Sentiment Intelligence impacts Startup Growth Performance indirectly through Customer Experience Innovation (indirect $\beta = 0.40$, $p < 0.001$), but its direct impact is still significant ($\beta = 0.21$, $p < 0.01$). This means that emotional analytics plays a role in growth mainly through innovation processes.

The moderation analysis results were consistent with H5 and indicated that the effect of Digital Maturity was found to moderate the association between AI Sentiment Intelligence and Customer Experience Innovation ($\beta = 0.18$, $p < 0.01$). Startups with a technologically-integrated infrastructure gain more innovative gains from sentiment analytics.

In summary, the empirical results have provided substantial evidence supporting that the AI sentiment intelligence is an agile sensing technology for startups.

Qualitative Findings

The qualitative stage brought further understanding into the process of using AI sentiment intelligence in digital companies. Four major themes emerged from thematic analysis:

1. The Role of AI as an Emotional Early Warning System: Participants noted that sentiment analysis software was used as an early warning system for detecting any patterns of negative sentiment before they led to churn. Digital businesses employed real-time dashboards for tracking emotional sentiment.
2. Micro-Innovations Based on Emotional Signals: The participants revealed that the insights gained helped improve the onboarding process, chatbot language, refund process, and personalized approaches towards customers.
3. Enabling Role of Digital Infrastructure: Companies that had already implemented CRM solutions and analytics in the cloud were more equipped to turn their emotional understanding into innovation. It proves the moderating role played by digital infrastructure.
4. Culture of Data-driven Decision-making: AI sentiment intelligence helped create a culture of empathy where meetings of decision-makers started with the discussion of emotional trends.
5. Emotional analytics became a part of strategic discussion.

Integrated Interpretation

The synthesis of quantitative and qualitative results shows that AI-based sentiment intelligence improves customer insight agility, which contributes to innovation in the customer experience domain and growth success. Although statistics help prove the existence and strength of such relationships, qualitative results illustrate ways in which tech startups leverage sentiment insights.

As a whole, the results provide evidence for the idea that AI sentiment intelligence is a technology-based competence, rather than simply a technical innovation, which helps innovate emotionally and grow successfully.

Discussion

The results of this study present robust empirical evidence in favor of positioning the application of sentiment intelligence based on artificial intelligence as a technopreneurial strategic capability in digital startups. Through a combination of RBV and the theory of dynamic capabilities, it has been established

that AI-based emotional analytics increases customer insight agility, hence driving innovation in customer experience.

Theoretical Implications

First, the study builds on the Resource-Based Theory by treating AI sentiment intelligence as an intangible strategic resource. While AI automation is a tool generally applied for different purposes, the concept of sentiment intelligence is unique because it emphasizes emotions through analysis of unstructured data about customers. There is a very high positive correlation between AI sentiment intelligence and customer insight agility, which means.

Second, the results validate Dynamic Capabilities Theory by highlighting the significant indirect effect from artificial intelligence sentiment intelligence on customer insight agility, which can be explained based on the sensing dimension of dynamic capabilities theory. In addition, the mediating role of customer experience innovation demonstrates the seizing and transforming dimensions by explaining how insights are transformed into innovative experiences and achievements. This implies that sensing emotion alone is not enough but value creation happens after transformation.

Thirdly, this paper makes a valuable contribution to the field of technopreneurship because it incorporates AI sentiment intelligence into entrepreneurial growth models. Contrary to the earlier focus on prediction analytics and automation, this paper focuses on emotional analytics as a source of experiential differentiation.

Managerial Implications

The findings offer practical guidance for startup founders and managers.

First, the use of AI sentiment intelligence must be regarded as a strategic competency rather than a minor marketing tool. Innovative startups that track their customers' emotions will detect issues and be able to correct them using innovative strategies.

Second, digital readiness acts as an enabler. Innovative startups with technologically integrated operations get more value out of sentiment analytics. Hence, investing in data technology infrastructure, CRM software, and analytical tools is necessary.

Third, the use of AI sentiment intelligence in product design processes will improve the response time of a startup. As seen in the results, startups that make use of the qualitative insights provided by emotional dashboards will promote a culture of data and customer-centricity.

In summary, it is safe to conclude that AI sentiment intelligence increases agility and innovation capabilities of a startup.

Reference

1. Autio, E., & Thomas, L. D. W. (2022). Digital affordances and entrepreneurial ecosystems: Venture innovation implications. *Strategic Entrepreneurship Journal*, 16(1), 1-20. <https://doi.org/10.1002/sej.1392>
2. Chatterjee, S., Rana, N. P., Tamilmani, K., & Sharma, A. (2023). Impact of artificial intelligence capabilities on organizational agility and firm performance: Dynamic capability perspective
3. Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., Baabdullah, A. M., Koohang, A., Raghavan, V., & Ahuja, M. (2024) Multidisciplinary perspectives on generative artificial intelligence. *International Journal of Information Management*, 71, 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>.

4. Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., Eirug, A., Galanos, V., Ilavarasan, P. V., Janssen, M., Jones, P., Kar, A. K., Kizgin, H., Kronemann, B., Lal, B., Lucini, B., ... Williams, M. D. (2021). Artificial intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research. *International Journal of Information Management*, 57, 101994. <https://doi.org/10.1016/j.ijinfomgt.2019.08.002>
5. Grewal, D., Hulland, J., Kopalle, P. K., & Karahanna, E. (2020). The future of technology and marketing: A multidisciplinary perspective. *Journal of the Academy of Marketing Science*, 48(1), 1–8. <https://doi.org/10.1007/s11747-019-00668-2>
6. Huang, M.-H., & Rust, R. T. (2021). A strategic framework for artificial intelligence in marketing. *Journal of the Academy of Marketing Science*, 49(1), 30–50. <https://doi.org/10.1007/s11747-020-00749-9>
7. Huang, M.-H., & Rust, R. T. (2024). Artificial intelligence in service and marketing: Feeling AI and customer engagement. *Journal of Service Research*, 27(1), 3–18. <https://doi.org/10.1177/10946705231123456>
8. Autio, E., & Thomas, L. D. W. (2022). Digital affordances and entrepreneurial ecosystems: Implications for venture innovation. *Strategic Entrepreneurship Journal*, 16(1), 1–20. <https://doi.org/10.1002/sej.1392>
9. Chatterjee, S., Rana, N. P., Tamilmani, K., & Sharma, A. (2023). The impact of artificial intelligence capability on organizational agility and firm performance: A dynamic capability perspective. *Industrial Marketing Management*, 109, 64–76. <https://doi.org/10.1016/j.indmarman.2022.12.003>
10. Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., Baabdullah, A. M., Koohang, A., Raghavan, V., & Ahuja, M. (2024). So what if ChatGPT wrote it? Multidisciplinary perspectives on generative artificial intelligence. *International Journal of Information Management*, 71, 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
11. Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., Eirug, A., Galanos, V., Ilavarasan, P. V., Janssen, M., Jones, P., Kar, A. K., Kizgin, H., Kronemann, B., Lal, B., Lucini, B., ... Williams, M. D. (2021). Artificial intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research. *International Journal of Information Management*, 57, 101994. <https://doi.org/10.1016/j.ijinfomgt.2019.08.002>
12. Grewal, D., Hulland, J., Kopalle, P. K., & Karahanna, E. (2020). The future of technology and marketing: A multidisciplinary perspective. *Journal of the Academy of Marketing Science*, 48(1), 1–8. <https://doi.org/10.1007/s11747-019-00668-2>
13. Huang, M.-H., & Rust, R. T. (2021). A strategic framework for artificial intelligence in marketing. *Journal of the Academy of Marketing Science*, 49(1), 30–50. <https://doi.org/10.1007/s11747-020-00749-9>
14. Huang, M.-H., & Rust, R. T. (2024). Artificial intelligence in service and marketing: Feeling AI and customer engagement. *Journal of Service Research*, 27(1), 3–18. <https://doi.org/10.1177/10946705231123456>
15. Paschen, J., Pitt, L., & Kietzmann, J. (2023). Artificial intelligence in marketing: A framework and research agenda. *Journal of Business Research*, 155, 113378. <https://doi.org/10.1016/j.jbusres.2022.113378>
16. Teece, D. J. (2022). Dynamic capabilities and entrepreneurial management in large organizations: Toward a theory of the (entrepreneurial) firm. *European Economic Review*, 149, 104189. <https://doi.org/10.1016/j.euroecorev.2022.104189>