



Leveraging Digital Technologies for Strategic Business Development by Millennial Entrepreneurs in Sidenreng Rappang

Andi Sri Kumala Putri P¹, Jumriah Basri¹, Sri Wirdana¹, A. Kartini Sari Putri D¹

¹Universitas Ichsan Sidenreng Rappang

*Corresponding Author: Andi Sri Kumala Putri P

Email: malaput02@gmail.com



Article Info

Article history:

Received 25 September 2024

Received in revised form 25

October 2024

Accepted 28 November 2024

Keywords:

Business Strategy

Millennial Entrepreneur

Student

Business Environment

Abstract

This study examines the business strategies applied by millennial entrepreneurial students in Sidenreng Rappang Regency, South Sulawesi. These students are engaged in various business sectors such as food and beverages, fashion, cosmetics, services, art and design, and digital business. The primary purpose of the study is to analyze the strategies used in responding to business opportunities, competitive advantages, contributions to entrepreneurship learning in higher education, and obstacles and solutions faced by students. With a qualitative phenomenological approach, this study explores the experiences of young entrepreneurs in taking advantage of market opportunities that other entrepreneurs often ignore. Students utilize business model innovation theory by considering factors such as understanding consumer behavior, product differentiation, service quality, and location and network. Entrepreneurship learning in higher education makes an essential contribution to equipping students with an understanding of business strategies and their application in actual practice. Of the ten respondents, five have participated in entrepreneurship seminars and training, while the other five are self-taught and through campus activities. These two methods are considered influential in shaping entrepreneurial skills and mindsets. The challenges faced by millennial entrepreneurs, as well as the solutions they implement, show relevance to modern management theory. This research provides insight into how entrepreneurship education and training can support student business development.

Introduction

Becoming an Entrepreneur is not something that is made up but arises from a person, which is usually caused by sensitivity to the surrounding environment (Ali, 2021). An entrepreneur is a person who can create something that has never existed before or can also create something different from what exists (Hasibuan & Novita, 2014). The role of youth in a nation is no longer questionable; young people always present their creativity, innovation, muscular physique, and new knowledge, so without the role of youth, a nation will find it challenging to experience change (Pratiwi, 2021). Approaching the productive age, young people develop their talents and hobbies, most of which are self-taught.

Based on the observations made at the beginning of this study, it was found that several students were struggling in the business world, either independently or in groups. The birth of entrepreneurs among students will have a positive impact on absolute economic stability, even if it can open jobs while reducing the unemployment rate (Asnawati, 2021). It is undeniable that Indonesia youth in the region can also compete in their work. This is

evidenced by the presence of Millennial Entrepreneurs, students who set up businesses ranging from sales stands to contemporary cafes or restaurants that we can find in Sidenreng Rappang Regency. In addition to the culinary field, several other fields are also popular with young students, namely fashion, cosmetics, culinary services, art design, and businesses in the digital field, such as content creators, application template/filter services, and others. In fact, this has become a trend for these people, so they compete to be able to exist in the world of millennial entrepreneurs.

The urgency of this research is in the form of the phenomenon of young entrepreneurial students who have business ideas that are born as a response to business opportunities in the surrounding environment and supported by the strategies they run so that it becomes an issue that should be explored, investigated and analyzed through scientific research methods. This issue is one of the leading global issues in economic development policy. This is also in accordance with the Sustainable Development Goals (SDGs) of sustainable development, the first of which is to overcome poverty, and the eighth is decent work and economic growth (Bappenas, 2023).

Based on this description, the problem formulation in this study is as follows: (a) What business strategies do students use in responding to business opportunities around them? (b) What are the advantages of this business? (c) What is the extent of the contribution of entrepreneurship learning in college to supporting the business strategy that is being pursued? (d) Have students ever participated in entrepreneurship training or programs? and (e) What obstacles have been experienced during business trips, and what is the solution strategy?

Methods

This research will be conducted in the Sidenreng Rappang Regency area, with the subject of this study being students who are millennial entrepreneurs. The study will analyze business strategies that are able to respond to the development of the surrounding business environment. So that later output can be obtained that can make a real contribution to business development and expansion. This study uses a qualitative type of research with a descriptive approach, while the technique used is phenomenology. Phenomenology is included in the qualitative research approach, which is scientific research that examines and investigates an event experienced by an individual, a group of individuals, or a group of living beings (H. N. Putri et al., 2023). An exciting event occurred and became part of the life experience of the research subject. Human knowledge is studied in phenomenological research through a thorough description of the individuals examined (Nasir et al., 2023).

In this study, the proposer will determine the informant using the purposive sampling technique, which is a technique to assess the sample by considering specific criteria so that the sample in this study is all university students in Sidenreng Rappang Regency which are included in the following criteria: a) Students have studied for at least two semesters, b) Still have student status (not yet finished), c) Have an independent or group business, d) Business/business has been operating for approximately six months. The steps of phenomenological research are (a) Determination of location and individual, (b) Approach process, (c) Strategy for determining the selection of informants, (d) Data collection techniques, (e) Data recording procedures, (f) Field issues, (g) Data storage, and (h) Reporting stage. So, it is hoped that this approach and method will be able to answer research questions.

Flow of data processing in phenomenological studies (Nasir & Nurjannah, 2023): (a) The researcher starts by explaining his experience in detail. (b) The researcher then finds statements (in interviews) about how people interpret the topic, describes the statement (data horizontalization), and develops details without repetition or overlap. (c) The statement is then classified into the relevant groups. The researcher describes these units in-depth and produces a textual explanation (textual description) of his experience, providing specific

examples. (d) The researcher then focuses on their thoughts and uses imaginative variants or structural descriptions, searches for all imaginable interpretations and viewpoints, evaluates the frame of reference of the phenomenon, and establishes how these symptoms are perceived. (e) The researcher then develops a comprehensive explanation of the meaning and core of his experience. (f) This procedure begins with the researcher expressing his knowledge and continues with the understanding of all informants. Then, create a composite description so that it gives birth to research conclusions.

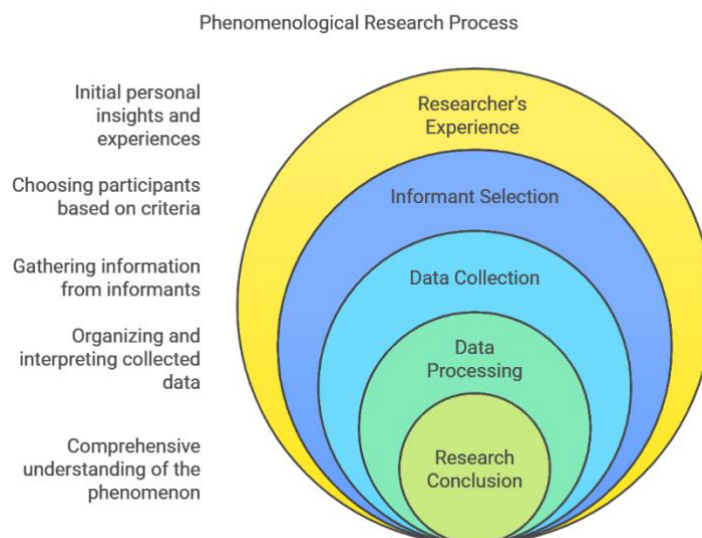


Figure 1. Phenomology Research Process

Results and Discussion

Capturing Unmet Market Opportunities Through Digital Technology

Based on the results of interviews that have been conducted with millennial entrepreneurs in Sidenreng Rappang, it can be identified that the use of digital technology significantly helps them in finding and taking advantage of market opportunities that have not been widely looked at by competitors. Entrepreneurs are leveraging digital tools to increase the competitiveness and success of their businesses. Through the data analysis carried out, it was found that the use of data analytics helped them understand unmet consumer needs.

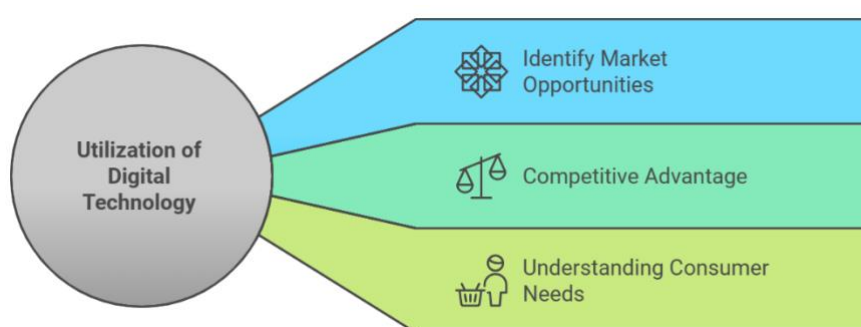


Figure 2. Leveraging Digital Technology to Capture Market Opportunities

Millennial entrepreneurs in Sidenreng Rappang utilize digital technology to identify market needs, improve business strategies, and increase customer satisfaction and loyalty. The following table 1 explains the use of digital technology to capture market opportunities.

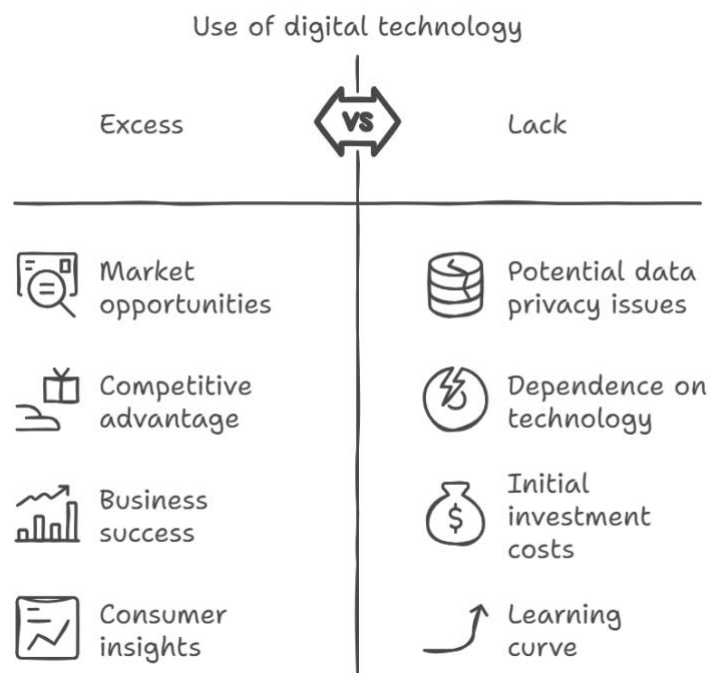


Figure 3. Advantages and Disadvantages of Utilizing Digital Technology to Capture Market Opportunities

Table 1. Utilization of Digital Technology to Capture Market Opportunities

No	Digital Technologies Used	Intended Use	Results Achieved
1	Google Trends	Identify market trends	Launching new products that match the trend
2	Google Analytics, Facebook Ads	Target local demographics	20% increase in sales in the local market
3	SEO Tools, Chatbot AI	Increase product visibility online	Website visits increased by 35%
4	SEMrush, Ahrefs	Analyze keywords for B2B marketplaces	Attracting new clients from the SME sector

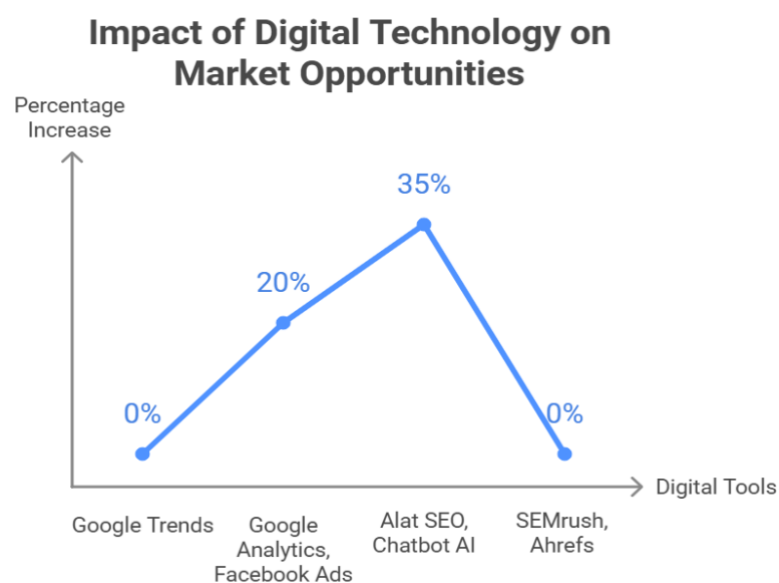


Figure 4. Graph of Digital Technology Utilization in Capturing Market Opportunities

In addition, based on the results of the research, it is known that millennial rulers in Sidenreng Rappang use social media platforms to capture market opportunities. Here is table 1.2 which explains the use of social media platforms in capturing market opportunities:

Table 2. Utilization of Social Media in Capturing Market Opportunities

No	Social Media Platforms Used	Strategic Objectives	Engagement Rate (%)	Number of New Customers (per month)
1	Instagram	Increase brand awareness	45%	120
2	Facebook	Product promotion with ads	50%	100
3	WhatsApp	Customer service and sales	60%	80
4	TikTok	Video content for product promotion	55%	90

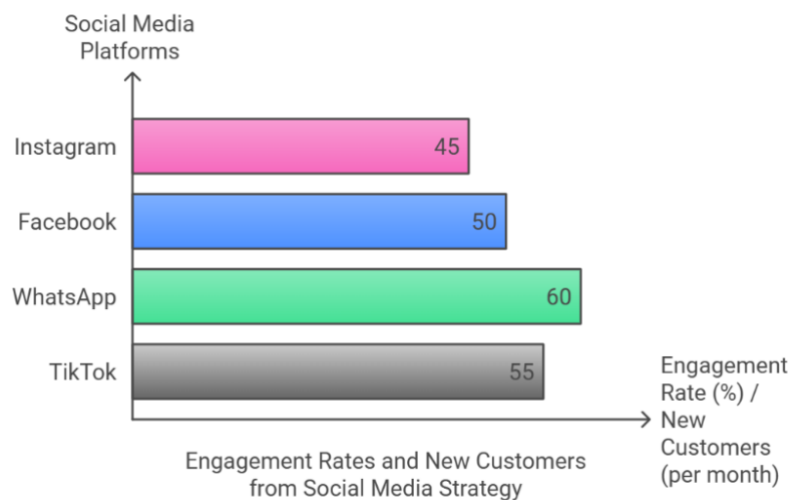


Figure 1.5 Graph of the Influence of Social Media in Capturing Market Opportunities

Boyles (2022) revealed that today's business innovation is not only limited to products and processes, but also includes technology-based business models. These findings are in line with Davidsson's (2015) theory, which states that successful entrepreneurs are able to proactively predict market changes by utilizing technology to identify new opportunities.

Analysis of Price Competition and Service Quality Improvement with Digital Tools

Millennial entrepreneurs are leveraging digital tools such as price management apps and AI-based customer service platforms to analyze price competition and improve service quality. For example, AI-based customer response automation systems allow them to provide faster and better service, leading to increased customer satisfaction. Millennial entrepreneurs in Sidenreng Rappang use various digital tools to face price competition and improve service quality. By utilizing dynamic pricing tools, CRM (Customer Relationship Management), and digital marketing platforms, they are able to dynamically adjust prices and provide more responsive services.

Table 3. Use of Digital Tools for Price Analysis and Service Improvement

No	Digital Tool Used	Price Adjustment Frequency (per month)	Customer Response Time (minutes)	Customer Satisfaction Score (out of 5)
1	Dynamic Pricing Tools, CRM	4	30	4.3

2	Facebook Ads, Google My Business	5	45	4.0
3	Chatbot AI, SEO Tools	3	20	4.5
4	Project Management Software, CRM	6	15	4.7

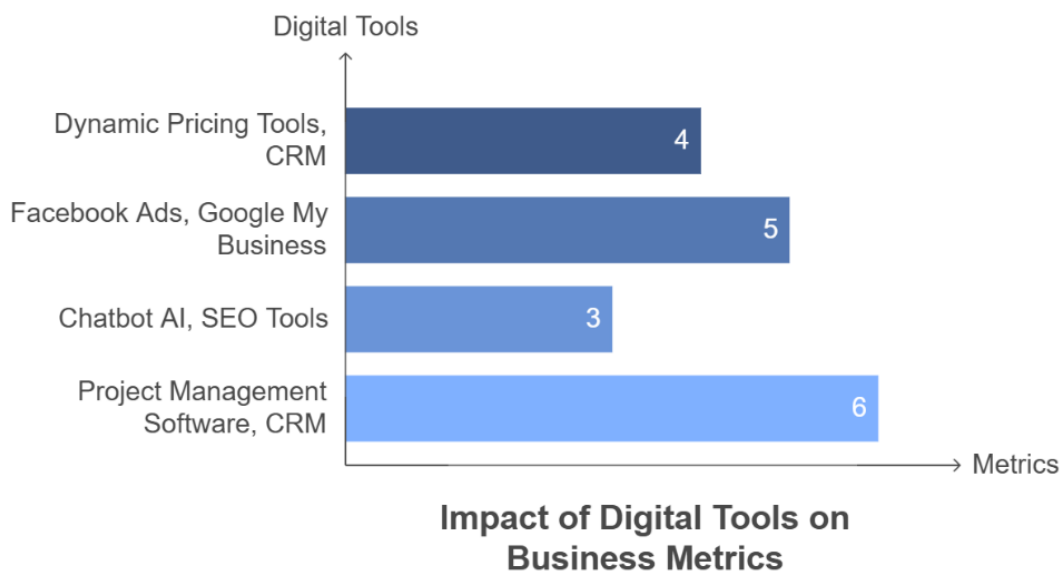


Figure 6. Graph of the Use of Digital Tools for Price Analysis and Service Improvement

According to Max (2021), collaboration and interaction in the digital ecosystem can encourage innovation and operational efficiency, so that pricing strategies and longer operating hours become more effective. Digital Innovation Hubs (DIHs) encourage cross-sector collaboration that leads to improved innovation outcomes through a structured interaction process (Serrano-Ruiz et al., 2024). Collaborative strategies among stakeholders in the manufacturing ecosystem, for example, suggest that coordinated efforts can result in higher innovation benefits, due to synergies that increase return on investment (Wang et al., 2024).

Leveraging Technology for Location Strategy and Business Environment

The location strategy supported by GPS-based applications and data-driven location analysis helps millennial entrepreneurs in determining strategic locations for their businesses. By leveraging IoT (Internet of Things) solutions, they can track environmental data in real-time to improve business sustainability. Millennial entrepreneurs in Sidenreng Rappang utilize data analytics to make strategic decisions in their businesses. By using analytics tools such as Google Trends, Google Analytics, and SEO Tools, they can gain in-depth insights into consumer behavior, market trends, and the performance of their products and services.

Table 4. Use of Data Analytics in Business Strategy

No	Data Analytics Tool Used	Business Decision Influenced	Revenue Growth After Data Analysis (%)	Customer Retention Increase (%)
1	Google Trends, Instagram Insights	Product Launch	25	15
2	Google Analytics, Facebook Ads Insights	Menu Optimization	30	18
3	SEO Tools, WhatsApp Analytics	Product Line Expansion	20	12
4	SEMrush, LinkedIn Analytics	Service Offerings	35	22

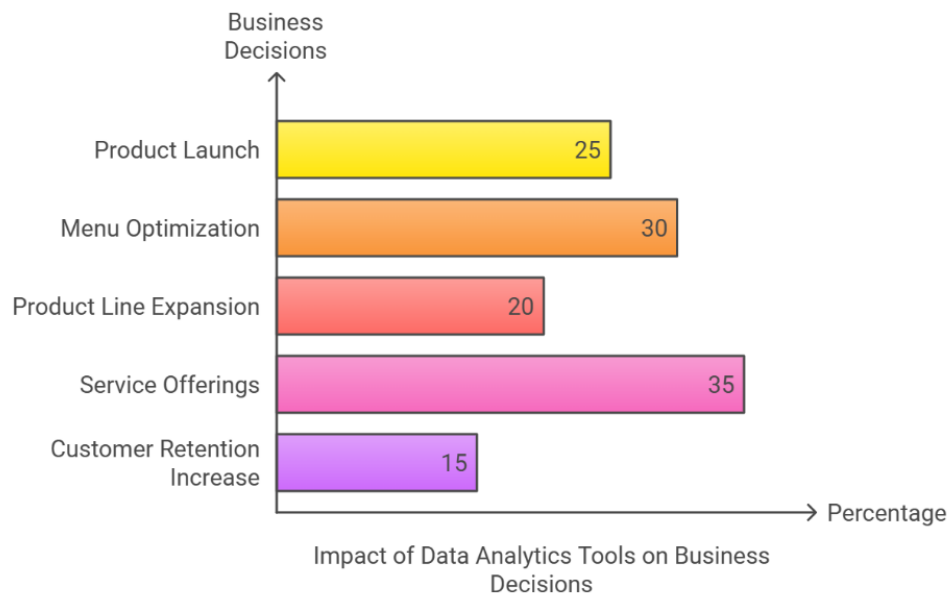


Figure 7. Graph of the Use of Data Analytics in Business Strategy

This supports the Sustainable Innovation theory which emphasizes the importance of continuous innovation (Lund et al., 2021). By leveraging tools like Google Trends and Google Analytics, they can uncover deep insights into consumer behavior and market trends. This is very important to optimize business locations and improve sustainability by utilizing real-time tracking of environmental data (Chandramouli, 2023). More sophisticated location intelligence techniques, such as the use of GIS and Python programming, allow entrepreneurs to analyze spatial data, so they can determine optimal service coverage and select strategic retail locations (Chandramouli, 2023).

Maximizing Digital Resources and Trends for Competitive Advantage

The results of the analysis show that millennial entrepreneurs utilize technologies such as social media, e-commerce, and marketing automation to optimize the use of resources and keep up with market trends. Millennial entrepreneurs in Sidenreng Rappang use various digital resources and follow digital trends to gain a competitive advantage. By leveraging platforms such as e-commerce, cloud kitchen, content marketing, and online courses, they are able to improve cost efficiency and expand their market reach.

Table 5. Maximizing Digital Resources for Competitive Advantage

No	Digital Resource Used	Competitive Advantage Gained	Cost Reduction (%)	Market Reach Increase (%)
1	Influencer Marketing, E-commerce	Brand Awareness	15	30
2	Cloud Kitchen, Social Media Ads	Cost Efficiency	20	35
3	Content Marketing, Online Courses	Market Reach	10	25
4	Freelance Platforms, Virtual Workshops	Client Acquisition	25	40

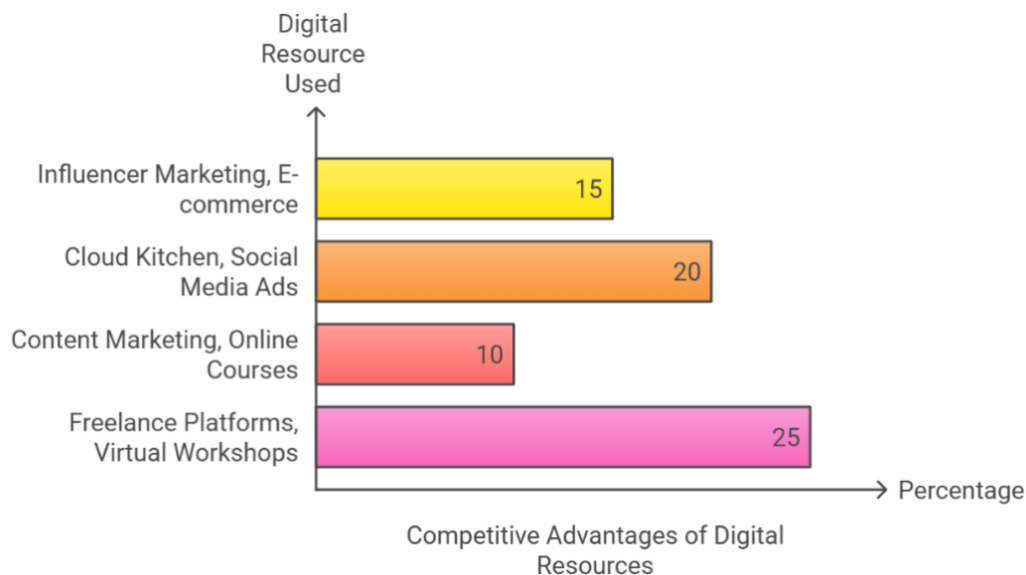


Figure 8. Graph Maximizing Digital Resources for Competitive Advantage

Research by Lund et al. (2021) shows that digital technologies, such as AI and blockchain, are expanding innovation across different sectors, allowing businesses to be more responsive to market changes. The synergy between AI and blockchain has been shown to streamline business processes, especially in reducing transaction costs and increasing transparency in various sectors, such as finance, healthcare, and energy (Alzoubi, 2024; Rane et al., 2023). AI enhances the cognitive capabilities of companies, while blockchain ensures data integrity, enabling the creation of innovative applications such as digital twins that fundamentally change business dynamics (Roumeliotis et al., 2024). Empirical studies show that the integration of this technology is able to increase the accuracy of demand prediction by up to 97.1% and increase the customer satisfaction ratio by 97.2%, which ultimately has a significant impact on business innovation strategies (Wang et al., 2022).

Business Advantages of Technology-Based Millennial Entrepreneurs

Understanding Consumer Behavior through Data Analytics

Millennial entrepreneurs in Sidenreng Rappang use data analytics to understand customer behavior, so they can tailor products and services to specific customer needs. Millennial entrepreneurs in Sidenreng Rappang use data analytics to understand consumer behavior more deeply, allowing them to adjust marketing strategies, improve customer satisfaction, and encourage repeat purchases.

Table 6. Utilizing Analytics Data to Understand Consumer Behavior

No	Analytics Tool Used	Consumer Behavior Analyzed	Customer Satisfaction Increase (%)	Repeat Purchase Rate Increase (%)
1	Google Analytics, Instagram Insights	Product Preferences	30	20
2	Facebook Ads Insights, Google Trends	Purchase Frequency	35	18
3	SEO Tools, WhatsApp Business Analytics	Customer Feedback	25	22
4	LinkedIn Analytics, SEMrush	Content Engagement	40	30

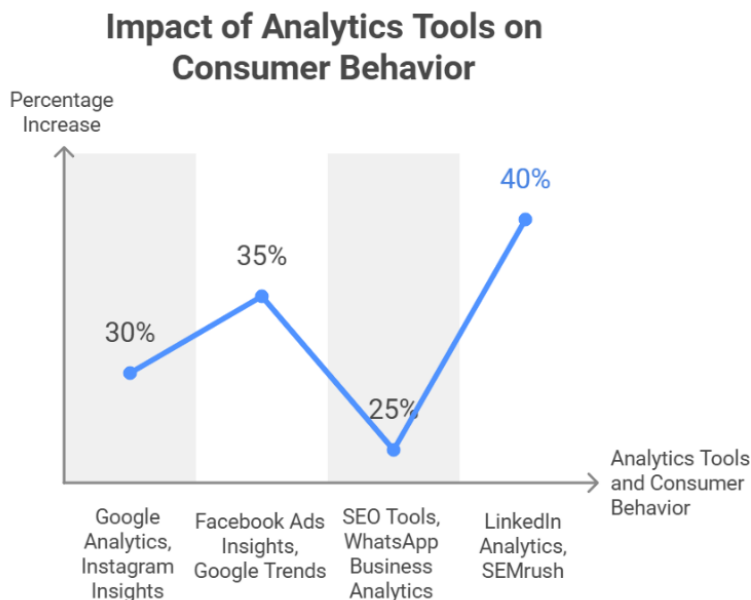


Figure 9. Graph of the Influence of Data Analytics to Understand Consumer Behavior

This aligns with the theory of consumer behavior by Khadka et al. (2017), where a deep understanding of customer preferences can improve customer loyalty and satisfaction. Research shows that a deep understanding of consumer behavior can have a significant impact on marketing strategies as well as the overall customer experience. By having a better insight into consumer preferences, businesses can tailor their product or service offerings, thereby driving increased loyalty and satisfaction. Factors such as lifestyle, psychographics, and demographics also play an important role in shaping consumer behavior, allowing companies to design marketing strategies that are more targeted and resonate with specific customer segments (Wardana et al., 2023).

Technology-Based Differentiation Strategy

The differentiation strategy implemented includes the use of environmentally friendly materials and technology-based product innovation. For example, the use of 3D printing technology to create unique products has increased their competitiveness in the local market. Millennial entrepreneurs in Sidenreng Rappang have implemented a technology-based differentiation strategy to differentiate their products and services from competitors, thereby creating a sustainable competitive advantage.

Table 7. Technology-Based Differentiation Strategies

No	Technology Used for Differentiation	Product Uniqueness Score (out of 5)	Increase in Customer Loyalty (%)	Market Share Growth (%)
1	Natural Ingredient Sourcing via IoT	4.8	30	15
2	Cloud Kitchen & AI-based Menu Design	4.6	25	18
3	3D Printing & Sustainable Materials	4.7	35	12
4	AI-Powered Design Tools & Automation	4.9	40	20

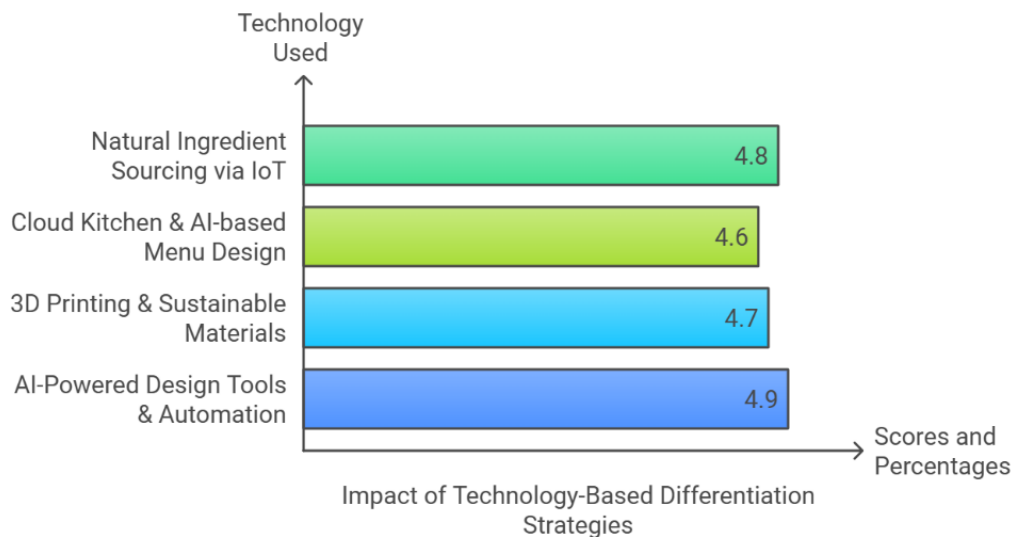


Figure 10. Graph of the use of technology-based differentiation strategies

Dangelico et al. (2013) emphasized the importance of sustainability practices in building a strong brand image. The emphasis on sustainability is supported by various studies that show that consumers tend to trust and be more loyal to brands that prioritize sustainability in their business strategies (Zulfikar, 2024). Companies that implement Environmental, Social, and Governance (ESG) practices not only increase customer loyalty but also gain a competitive advantage in an increasingly environmentally conscious market (Singh et al., 2024). Further studies show that differentiation efforts through sustainability practices allow companies to stand out more in a crowded market. This competitive advantage is important because consumers tend to choose brands that align with their personal values (Wójcik & Bulmer, 2024). Furthermore, compliance with sustainability obligations has proven to be able to improve the reputation of companies, which ultimately strengthens their market position (Moon, 2007).

Improving Service Quality through Automation

Millennial entrepreneurs in Sidenreng Rappang take advantage of automation technology to improve service quality and operational efficiency. By using tools such as AI Chatbots, CRM (Customer Relationship Management), and order processing automation, they can respond to customers faster and reduce the time it takes to complete orders.

Table 8. Improving Service Quality through Automation

No	Automation Technology Used	Customer Response Time Reduction (%)	Increase in Customer Satisfaction (%)	Operational Efficiency Improvement (%)
1	Chatbot AI, CRM	60	35	25
2	Automated Order Processing, Cloud POS	50	40	30
3	Customer Feedback Automation, SEO Tools	45	30	20
4	AI-Based Client Management, Automated Reports	70	50	45

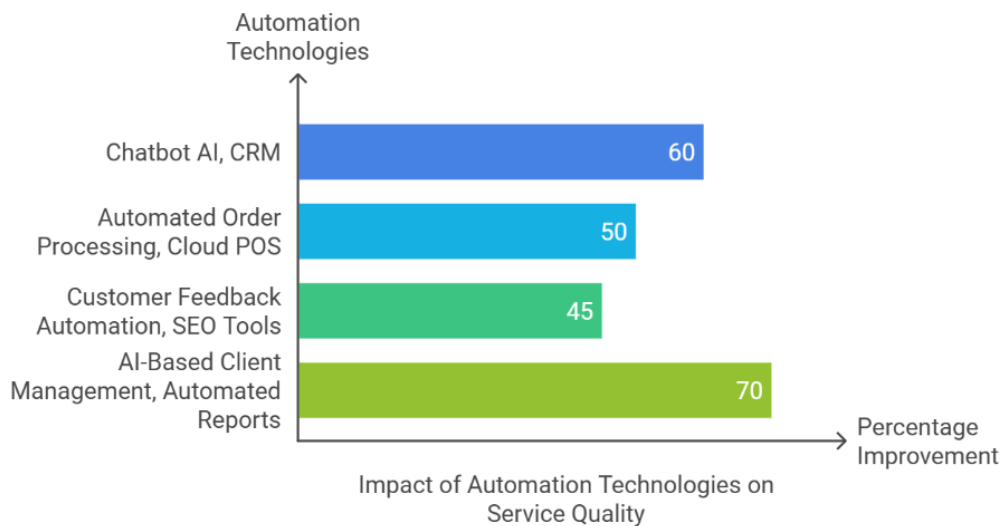


Figure 11. Graph of Service Quality Improvement through Automation

AI-based chatbots are designed to handle a large number of inquiries simultaneously, ensuring that customers get timely assistance with no restrictions on business hours, which is 24/7 (Setiawan et al., 2024). Additionally, AI's ability to predict customer needs through data analysis allows businesses to engage proactively, ultimately improving responsiveness and customer satisfaction (Rane et al., 2023).

Entrepreneurship and Technology Learning Support in Business Strategy

Application of Contextual and Digital Learning in Higher Education

The student entrepreneurs involved in this study showed that they were able to apply the entrepreneurial learning concepts learned on campus, such as financial analysis and digital marketing strategies. Contextual and digital learning in higher education has an important role in equipping students with relevant skills in the real world, especially for students who want to enter as entrepreneurs. By using digital technology and context-based learning approaches, universities can improve students' understanding and skills in applying theory into business practice.

Table 9. Impact of Contextual and Digital Learning on Student Entrepreneurship

No	Learning Approach Used	Skills Acquired	Business Impact	Skill Enhancement (%)
1	Business Simulation, Contextual Learning	Raw Material Management, Marketing	Raw material cost efficiency, increased brand awareness	30
2	Project-Based Learning, Online Courses	Digital Strategy, Data Analytics	Increase sales through social media	40
3	E-Learning, SEO Optimization	Digital Marketing, SEO	Increased website traffic and sales	35
4	Online Courses, Virtual Workshops	Automation, Client Management	Service time efficiency, increased client retention	45

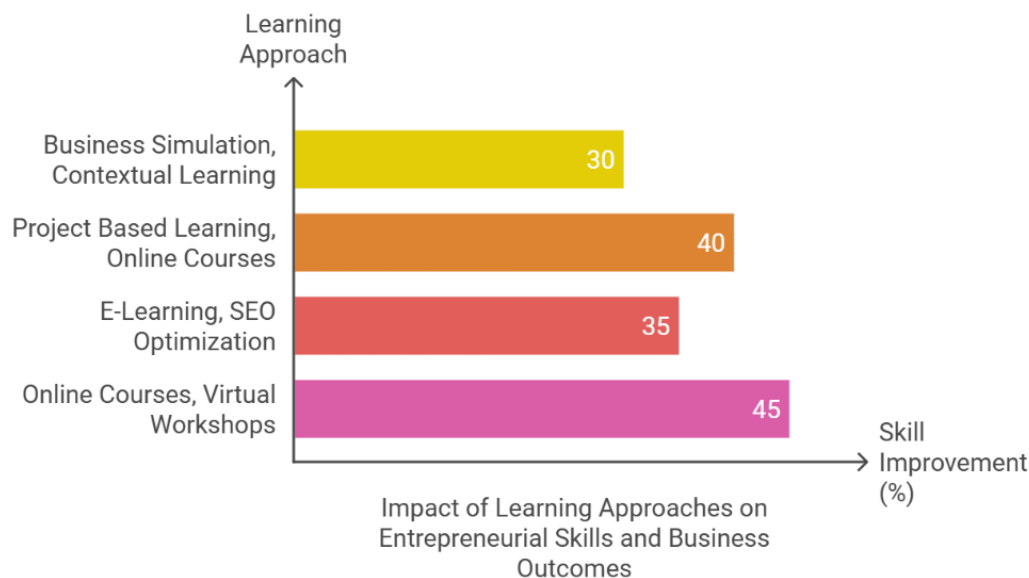


Figure 12. Graph of the Impact of Contextual and Digital Learning on Student Entrepreneurship

The Theory of Integrated Entrepreneurship Learning by Lackéus (2013) emphasizes the importance of integration between theoretical and practical learning in building entrepreneurial competence. Research shows that practice-based methods and action learning significantly improve students' entrepreneurial competence, especially in terms of business initiation, decision-making, and risk management (Rae, 2009). Real-world experience-based approaches, such as internships, case studies, and hands-on entrepreneurial projects, enable students to tackle real business challenges, equipping them with skills relevant to the world of work (Wiley, 2023).

Participation in Online Training Programs and Seminars

Most respondents attended online seminars and training to deepen their understanding of digital technologies in business. Millennial entrepreneurs in Sidenreng Rappang who participate in online training programs and seminars benefit significantly in improving their skills. This training helps them implement new strategies that have a direct impact on business growth and increased customer engagement.

Table 10. Impact of Participation in Online Training and Seminars on Business Growth

No	Training/Seminar Attended	Knowledge Application Rate (%)	Business Growth After Training (%)	Increase in Customer Engagement (%)
1	Digital Marketing, Product Development	75	30	45
2	Social Media Ads, Culinary Innovation	80	35	50
3	SEO Optimization, E-Commerce Strategy	70	25	38
4	AI Tools, Project Management	85	40	60

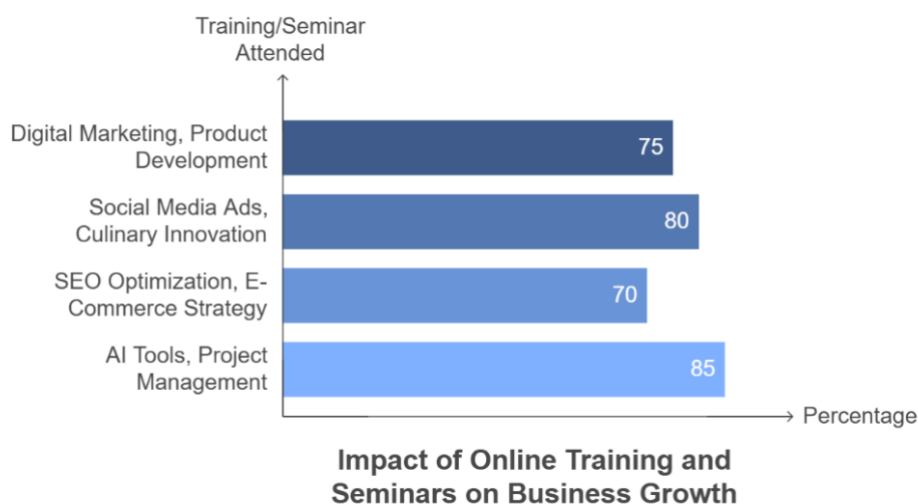


Figure 13. Graph of the Impact of Participation in Online Training and Seminars on Business Growth

According to Lim & Wang (2016), online-based learning is very important to improve entrepreneurial skills in the digital era. Digital learning environments provide a variety of educational methods, including multimedia content, discussion forums, and interactive communication channels, which play an important role in developing entrepreneurial skills (Kraus et al., 2021).

Technical Challenges and Solutions in the Implementation of Digital Strategies

Market Competition and Social Media Optimization

Millennial entrepreneurs face the challenges of similar businesses emerging in the same location. In the face of increasingly fierce market competition, millennial entrepreneurs in Sidenreng Rappang are leveraging social media as a strategic tool to expand customer reach, increase brand visibility, and differentiate themselves from competitors. By using social media platforms such as Instagram, Facebook, and TikTok, they can optimize their digital marketing campaigns, target the right audiences, and increase engagement with customers.

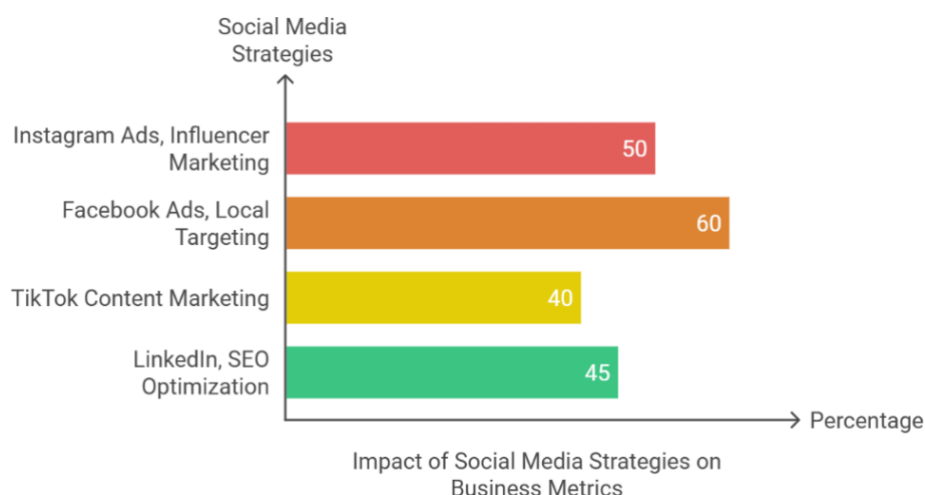


Figure 14. Graph of the Impact of Social Media Optimization on Market Competition

They address this with aggressive digital marketing strategies and social media optimization to increase brand visibility (Asha & Chandrasekar, 2023). Platforms like Instagram and Facebook allow brands to connect directly with consumers, creating a sense of community and increasing customer loyalty (Bahcecik et al., 2019).

Technical Constraints and Product Quality Management

Entrepreneurs face problems in inventory management and product quality that can quickly deteriorate. In running a business, millennial entrepreneurs in Sidenreng Rappang often face technical obstacles related to the production process and product quality management. These obstacles can be in the form of problems in controlling the quality of raw materials, errors in production, to difficulties in meeting quality standards expected by consumers. Although many entrepreneurs are innovating with the use of technology, such as automation or software to manage quality, they still face challenges that must be solved to ensure their products meet market expectations (Putri et al., 2021).

Table 11. Technical Obstacles and Solutions in Product Quality Management

No	Technical Constraints	Implemented Solutions
1	Difficulties in Standardization of Production Processes	Use of automatic quality measuring devices
2	Unstable Raw Material Quality Control	More efficient raw material procurement system
3	Time-consuming Production Process	Adopt automatic sewing machine technology
4	Difficulties in Efficient Packaging	Use of more advanced design software

The implemented solution involves the use of IoT systems to monitor inventory in real-time and ensure product quality is maintained (Sallam et al., 2023). This technology allows companies to leverage advanced devices, such as RFID tags and sensors, to track inventory levels in real-time, so businesses can maintain optimal stock and avoid overstocking (Khan et al., 2024). IoT-based monitoring systems have been proven to improve accuracy and efficiency, especially in the SME sector, by providing more reliable and cost-effective results (Zulkifli et al., 2022).

Operational Efficiency through Time and Delivery Automation

Time problems related to lecture schedules often interfere with business management. Operational efficiency is an important factor in maintaining business competitiveness, especially in a highly competitive market. Automation in various aspects of operations, such as time management and delivery, can help entrepreneurs reduce the time required for certain processes, increase productivity, and lower operational costs. This automation is essential for businesses that involve high order volumes, such as e-commerce, manufacturing, and services.

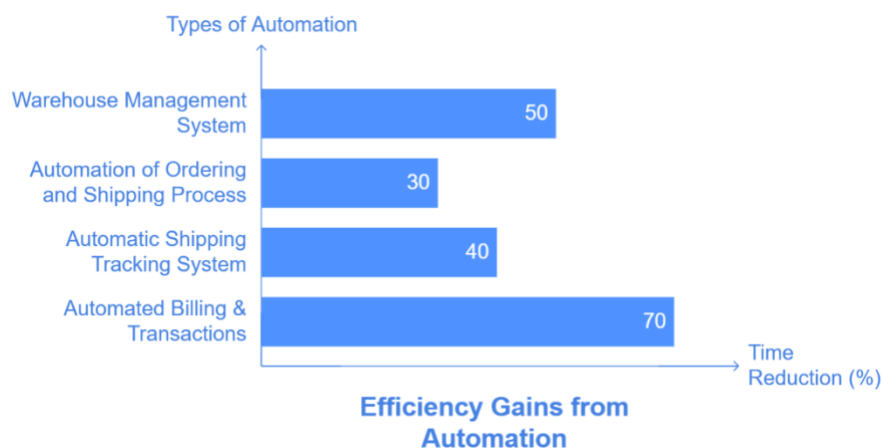


Figure 15. Graph of the Impact of Time and Delivery Automation on Operational Efficiency

The implemented solution includes the use of automated time management and logistics applications to optimize product delivery (Ferreira & Reis, 2023). This technology supports more effective planning of resources and budgets, as well as real-time monitoring of project progress, which ensures that projects are completed on time and with optimal resources (Akpe et al., 2024).

Financial Management with Digital Payment System

Effective financial management is essential for business continuity and growth, especially for millennial entrepreneurs who manage their businesses with a digital approach. One of the important elements in modern financial management is the use of digital payment systems. This system allows financial transactions to be conducted online, which reduces the need for cash transactions and provides efficiency in cash flow management. The use of digital payment systems also provides convenience in recording, reporting, and financial supervision.

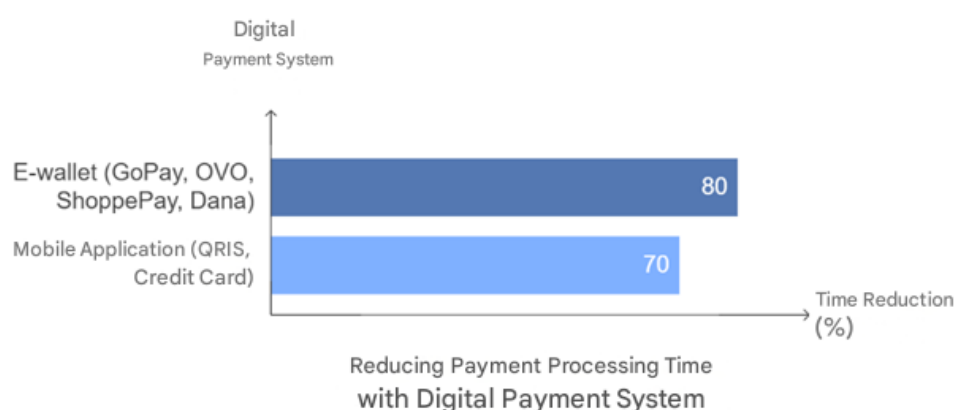


Figure 15. Graph of the Impact of the Use of Digital Payment Systems on Financial Management

Limited cash flow and payment problems from customers are solved by implementing a digital payment system and efficient receivables management (Komarraju et al., 2024). By using digital payment solutions, businesses can improve customer satisfaction through the convenience and speed of transactions, as well as streamline financial operations. This system significantly reduces the time lag between sales and availability of funds, which helps to improve the Company's cash flow (Ogundipe et al., 2024). This not only increases liquidity, but also speeds up the business's cash cycle.

Conclusion

This article reviews the efforts of millennial entrepreneurs in Sidenreng Rappang Regency in adopting digital technology as a strategy to face market competition challenges and optimize business opportunities. Through an approach that combines theory learned in college with hands-on practice in the field, these entrepreneurs leverage data analytics and digital marketing to improve the competitiveness and success of their businesses. This strategy not only improves their adaptability to rapid market changes but also helps them in adapting products according to consumer needs and desires.

In more depth, this article describes how technologies such as automation and analytics tools are key elements to improving operational efficiency and in-depth understanding of unmet consumer needs. Active participation in online training programs is a means for millennial entrepreneurs to hone relevant skills and build businesses that are more responsive to market changes. As such, the integration of these technologies not only supports business growth, but also strengthens customer loyalty thanks to their ability to respond proactively and innovatively to market changes.

Acknowledgment

This research is funded by the Directorate of Research, Technology and Community Service (DRTPM), the Directorate General of Higher Education, Research and Technology (DITJEN DIKTI), and the Ministry of Education, Culture, Research and Technology (Kemdikbudristek) of the Republic of Indonesia

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