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Capturing Business Opportunities In The Sports Industry With An Integrated Technology Approach

Rony Mohamad Rizal[1], Silvy Juditya[2], Diky Komarudin[3], Rifky Kurniawan[4]

[1,2,3,4] STKIP Pasundan, Cimahi, West Java, Indonesia

Abstract

This research aims to examine the application of integrated technology in the fitness industry at Allday Fitness in Soreang to improve operational efficiency and customer experience as well as capture new business opportunities. This research utilized a qualitative technique, employing a case study approach that included in-depth interviews, participant observation, and documentation. There were 25 people who took part in the study. Five management staff members looked at technology strategies, five fitness trainers and operational staff members looked at how technology was used every day, and 15 active members of Allday Fitness aged 22 to 45 were asked about their experiences with technologies that were integrated. Utilizing technology such as mobile fitness applications, IoT-enabled fitness monitoring devices, and cloud-based management systems can enhance operational efficiency and improve customer experience. In addition, AI-based service personalization and the development of online community platforms create business opportunities that drive customer loyalty and engagement. Regular training and strategic partnerships can overcome constraints such as limited staff skills and investment costs. This research confirms the importance of technology as a strategic asset that supports innovation and business growth in the fitness industry.

Keywords: *Integrated Technology, Fitness Industry, Service Personalization*

INTODUCTION

The sports and fitness industry has undergone a significant transformation along with the development of digital technology. The presence of technologies such as the Internet of Things (IoT), artificial intelligence (AI), and cloud computing has opened up new opportunities to create more effective and efficient services while improving member experience. These technologies strengthen business operations by providing real-time data that can be used for better decision-making and service personalization (García-Fernández et al., 2020). IoT's potential for collecting actionable real-time insights is emphasized by Windasari et al., (2021), who state that fitness wearables significantly increase user satisfaction through instant feedback mechanisms. AI is particularly transformative, offering predictive analytics for fitness routines and improving customer retention, as highlighted by (Singh & Singh, 2024). Moreover, Pizzo et al., (2021) point out that the integration of gamification into fitness apps through AI fosters higher levels of engagement. Finally, Cao (2022) discusses the scalability of cloud computing in fitness, allowing for seamless integration of member management, class scheduling, and performance tracking.

The development of IoT enables devices such as wearable fitness equipment to monitor real-time physical activities, such as heart rate, daily steps, and calories burned. Such data not

Correspondence author: Rony Mohamad Rizal, STKIP Pasundan, Cimahi, Indonesia.
Email: denrony@gmail.com

only helps members monitor their progress but also provides trainers with greater insight to design more precise and targeted exercise programs (Dellaserra et al., 2014). Research by (Dergaa et al., 2024a) confirms that IoT-based fitness monitoring improves data accuracy, enhancing trainers' ability to create tailored programs. Additionally, Yadava et al. (2022) highlight IoT's role in increasing user motivation by integrating health tracking with goal-setting features. Another study by (Zheng & Liu, 2022a) demonstrates how IoT enables seamless integration with cloud systems, automating operational processes in fitness centers. Lastly, Dessart and Duclou (2019) illustrate how IoT-enabled platforms promote community engagement among gym members, enhancing overall satisfaction and loyalty.

In addition to IoT, AI plays an important role in the fitness business by enabling service personalization. This technology is able to analyze member data to generate specific recommendations regarding exercise and nutrition programs, increasing member loyalty and satisfaction (Parashar et al., 2023). AI-based applications can also integrate gamification features that encourage user motivation and engagement in their fitness activities (Pizzo et al., 2021b). This is in line with research (Schneider, 2019) which shows that digitization not only improves operational efficiency but also creates new business opportunities through continuous innovation.

Furthermore, the application of cloud computing in a cloud-based management system facilitates operations by providing data access from anywhere. Cloud technology also enables the integration of various functions such as member management, finance, and class scheduling. This plays an important role in reducing administrative burden and accelerating the decision-making process (Chang et al., 2023a; El Khatib et al., 2019). Research by Zheng & Liu, (2022) demonstrates how cloud computing improves operational flexibility by allowing seamless updates across multiple functions in real time. Moreover, Ahamed et al., (2013) highlight that cloud-based systems enhance data security and reliability, crucial for sensitive member and financial information. Another study by (Xiao et al., 2023) shows that cloud technology supports scalability in fitness centers, enabling simple expansion of services such as online bookings and performance tracking. Finally, the work of Farrokhi et al., (2021) emphasizes that the integration of cloud computing with AI leads to better predictive analytics for customer behavior and operational efficiency.

Amidst this transformation, fitness businesses are faced with opportunities and challenges. Research by (Özdemir & Hekim, 2018) mentioned that technology adoption must be balanced with the readiness of human resources and infrastructure so that the benefits can be optimized. In this context, Allday Fitness Soreang is an interesting case study to understand the application of integrated technology in the fitness industry in Indonesia.

Based on previous research, there is still room for further exploration of how technology can be leveraged to open up new business opportunities, such as the development of online community platforms and service personalization (Riana et al., 2023). Online community-based platforms are becoming an important business opportunity for the modern fitness industry (Ridwan & Halim, 2023). Social interaction among members through digital platforms increases member loyalty and engagement in fitness programs (YTJ Wongkar et al., 2024). Challenges in technology adoption, such as limited staff skills and investment costs, also need to be scrutinized to find appropriate solutions (Dukić et al., 2022; Özdemir & Hekim, 2018).

This study uses the Resource-Based View (RBV) theory as the main framework. According to Barney reviewed by McGee (2015), esources that are valuable, rare, and difficult to imitate can provide a competitive advantage for organizations. In the context of Allday Fitness, technologies such as IoT, AI, and Cloud Computing are considered as strategic resources that can improve operational efficiency and member experience. These technologies are not only tools for operations but also strategic assets that support business innovation and growth. By utilizing these resources, Allday Fitness can create unique services that are difficult for competitors to replicate, ultimately increasing the company's competitiveness in the fitness market (Schneider, 2019).

Based on the background and literature review presented, this study aims to answer the following questions: 1) How does the implementation of digital technology at Allday Fitness affect operational efficiency and member experience? 2) What are the business opportunities arising from service personalization and online community development at Allday Fitness; 3) How can challenges related to human resources and investment costs be overcome in the implementation of technology at Allday Fitness?

METHODS

Type of Research

This research employs a qualitative method, utilizing a case study approach. According to Yin & Campbell (2018), case studies are particularly useful when researchers want to dig deeper into complex phenomena in real-life contexts and answer “how” and “why” questions. This study is suitable for research at Allday Fitness because it allows in-depth exploration of the implementation of integrated technology and its impact on operations and member experience.

Research Subjects and Sampling Techniques

Researchers determine research subjects through the purposive sampling technique (Creswell, 2018). This technique allows researchers to select informants based on certain criteria that are relevant to the research focus. The research subjects were divided into three groups:

1. Allday Fitness Management: Five individuals are required to comprehend the technology implementation strategy.
2. Staff and Fitness Trainers: Five individuals will investigate the application of technology in daily operations.
3. Allday Fitness Members: 15 loyal members who actively use the Allday Fitness digital app to understand member perceptions and experiences. Aged 22–45 years old, actively using IoT apps and devices for at least 3 months, willing to spend time for an interview (at the gym or over the phone).

The number of respondents is considered sufficient when the data has reached saturation, i.e., when additional interviews do not provide new information(Creswell, 2018).

Ethical Considerations in Participant Recruitment

The study adhered to ethical principles in research to respect the rights and well-being of participants (Creswell, 2018). We took the following steps to maintain ethical standards during participant recruitment:

1. Informed Consent

   We provided all participants with a clear explanation of the research purpose, procedures, and their role in the study. We also explained to them the voluntary nature of their participation and their unrestricted right to withdraw at any time. Before data collection began, participants received and signed consent forms.
2. Confidentiality and Anonymity

   Participants were assured that their identities would remain confidential and that data would be reported in aggregate to prevent the identification of individual responses (Yin & Campbell, 2018). Only the research team had secure access to all personal data and interview transcripts.
3. Fair Recruitment

   We applied the purposive sampling technique to select participants who met specific inclusion criteria, such as familiarity with the Allday Fitness digital app. Selection was based solely on relevance to the research focus and without bias or coercion (Creswell, 2018).
4. Minimization of Risk

   We designed the study to minimize risk to participants. We included no intrusive or sensitive questions in the interviews, and selected the interview settings based on participant convenience and comfort.
5. Ethical Approval:

   The institutional ethics committee reviewed and approved the research proposal prior to data collection, ensuring compliance with ethical standards.

Data Collection Techniques

We collected the data using the following techniques to address the research questions:

1. In-depth interviews. We are creating a semi-structured interview guide that aligns with the research objectives, emphasizing technology utilization, barriers, and benefits. The next step involves securing ethical approval and gaining consent from the participants. Next, the selection of participants, including management, staff, and members, is carried out through targeted sampling. The next steps include distributing invitations, explaining the study, and verifying the availability of participants. The next step involves conducting interviews in a dedicated room at Allday Fitness or via internet video conferencing. We utilized a semi-structured framework to enhance adaptability and thoroughly answer all important questions. Each interview lasted for 10 to 15 minutes or until all questions were answered thoroughly and was audio recorded with the consent of the participants. After completion, we accurately transcribed the interview recordings and confirmed their accuracy with the participants, all while maintaining data confidentiality.
2. Participatory observation. We are developing an observation checklist to monitor the use of IoT devices, applications, and interactions between members and trainers. Obtain authorization to conduct observations during designated gym sessions. Participate in Allday Fitness sessions as a passive observer, carefully recording real-time interactions with IoT devices and mobile apps. Focus on actions including app usage for reservations, data visualization from wearable IoT devices, and feedback from trainers. Conduct observations over a two-week period. Assess observed data against interview findings to confirm consistency and triangulation.
3. Documentation. Request operational reports, member information, and IoT usage records from Allday Fitness management. Establish ethics agreements and data sharing protocols. Collect documentation, including weekly class schedules, member app activity, and IoT device analytics. Authenticate data sources with management to ensure accuracy. Review collected materials along with interview and observation data to corroborate results and understand trends.

These operational procedures ensure methodical and ethical data collection while meeting the overall research objectives. By adhering to this systematic methodology, we mitigate bias and ensure the reliability and authenticity of the data.

Data Analysis Technique

We used thematic analysis to analyze the obtained data. We use thematic analysis to identify, analyze, and report patterns or themes in qualitative data. We chose this method because it offers a clear framework for analyzing data from interviews and observations (Naeem et al., 2023). The steps of thematic analysis include:

1. Data Familiarization: repeated reading of interview transcripts and observation notes to understand the overall context and meaning of the data.
2. Initial Coding: identification of initial codes based on key emerging themes, such as “operational efficiency," “service personalization," and “technology adoption challenges.”.
3. Theme Search: grouping relevant codes into larger themes.
4. Theme Review: Make sure the themes align with the data and research focus.
5. Report Writing: We systematically organized the results and discussion using the identified themes.

To ensure data validity and reliability, this research applied the following techniques (Creswell, 2018):

1. Data Triangulation:This technique involves using multiple sources of data to cross-check and validate findings. This study conducted triangulation by comparing data obtained from interviews, observation notes, and document analysis. We cross-validated insights from Allday Fitness members with responses from staff and management to ensure consistency in the identified themes.
2. Member Checking:Member checking refers to the process of sharing preliminary findings or interpretations with participants to verify their accuracy. We gave participants the opportunity to review the interview transcripts and the identified themes during this study. We used participant feedback to refine and confirm the interpretations, ensuring they accurately represented the participants' perspectives.
3. Audit Trail:An audit trail documents the research process, including data collection, analysis, and decision-making steps. We maintained detailed records in this study, including interview transcripts, coding notes, and analytical memos. This transparency ensures that the research process is traceable and can be independently evaluated by others.

By incorporating these techniques, the study not only enhances the credibility and trustworthiness of its findings but also ensures a rigorous approach to qualitative data analysis.

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RESEARCH RESULTS

Application of Technology at Allday Fitness Soreang

Based on the thematic analysis, three main themes emerged from the results:

Operational Efficiency: Integrated technology significantly improved operational processes at Allday Fitness. For instance, the use of cloud-based management systems has streamlined administrative tasks such as membership management, finance, and class scheduling. A manager mentioned, "With the cloud-based system, we can access and update member information anytime, which reduces delays in decision-making and improves the overall workflow." This finding aligns with (Chang et al., 2023b), who emphasized how cloud computing accelerates administrative processes and increases efficiency. Furthermore, automation of certain manual processes reduces errors and allows staff to focus on delivering better member experiences (Zheng & Liu, 2022a).

Service Personalization: The use of mobile fitness apps and IoT-based monitoring tools has enabled Allday Fitness to deliver personalized services tailored to individual needs. Members use the app to book classes, monitor workout progress, and access fitness tips. One participant shared, "I like how the app recommends exercises based on my fitness progress. It feels like having a personal trainer in my pocket." IoT-based devices such as wearable fitness trackers provide real-time data, helping trainers design more targeted workout plans. Windasari et al., (2021b) found that health monitoring tools boost engagement and motivation in fitness activities. These technologies enhance the overall member experience and strengthen loyalty by addressing individual preferences and needs (Feng et al., 2020).

Technology Adoption Challenges: Despite the benefits, challenges remain in adopting advanced technologies. A staff member stated, "Learning to use new technology takes time, and not everyone is comfortable with it initially." We also highlighted high investment costs as a barrier to implementing more sophisticated systems. Özdemir (2020) emphasized that regular staff training and strategic partnerships are critical for overcoming these barriers and ensuring the effective adoption of technology. These challenges underline the need for ongoing support and resource allocation to maximize the potential of integrated technologies.

Open Business Opportunities

The implementation of technology in Allday Fitness not only improves operations but also creates new business opportunities. The two most prominent opportunities are service personalization and the development of an online community platform. AI-based service personalization. AI technology enables Allday Fitness to provide personalized services through member data analysis and specific recommendations related to exercise and nutrition. This

supports the findings of Parashar et al. (2023), who mentioned that AI-based personalization can increase member engagement and satisfaction. This personalization includes recommendations on exercise duration, exercise type, and nutrition advice (Dergaa et al., 2024b), all of which are based on data collected from IoT devices. This is in line with members' needs for relevant and individualized services.

Development of an Online Community Platform. In addition to personalization, Allday Fitness also plans to develop an online community platform to increase member engagement and build community. Online communities can increase member loyalty by allowing them to interact and support each other in achieving their fitness goals (Dessart & Duclou, 2019). The platform is not only a place to share experiences but also expands marketing opportunities through member recommendations and social interactions.

Challenges and Solutions in Technology Implementation

Although the implementation of technology in Allday Fitness provides significant benefits, there are some challenges faced in the implementation process. The main challenges are limited human resources and technology investment costs.1. Human resource limitations. One of the primary challenges is the staff's limited proficiency in utilizing the new technology. Trainers and staff need time to adapt to technologies such as IoT and cloud computing. Dukić et al. (2022) emphasized that lack of skills and training is an obstacle to technology adoption in the fitness industry. To overcome this challenge, Allday Fitness implements periodic training programs so that staff can more easily adapt and maximize the use of technology.

Technology Investment Cost. The implementation of technologies such as IoT and AI requires significant investment costs. This can be a burden, especially for small and medium-sized businesses. Özdemir & Hekim (2018) proposed that strategic partnerships with technology providers and utilization of subsidy programs can help reduce this cost burden. Allday Fitness has started to establish partnerships with several technology providers and is considering the use of a hybrid business model that combines physical and digital services to expand the market and increase revenue.

DISCUSSION

The results of this study revealed three main themes from the implementation of integrated technology at Allday Fitness Soreang: operational efficiency, service personalization, and challenges in technology adoption. We discuss these findings below, bolstered by pertinent literature and practical insights.

1. Operational Efficiency

Integrated technology, particularly cloud computing, has significantly enhanced

operational workflows at Allday Fitness. The ability to access and update member information in real time has reduced delays in administrative tasks and decision-making processes. For instance, a manager highlighted, "With the cloud-based system, we can access and update member information anytime, which reduces delays in decision-making and improves the overall workflow." This aligns with findings from Chang et al. (2023b), who noted that cloud-based management systems accelerate administrative processes, improve accuracy, and reduce reliance on manual workflows.

Furthermore, cloud technology facilitates automation that reduces errors in routine tasks, allowing staff to concentrate on delivering better services.*Zheng & Liu (2022)* emphasized that such technological integration creates a more responsive and efficient operational environment. The findings also suggest that the adoption of cloud computing could serve as a model for other fitness centers aiming to streamline operations while maintaining high service standards.

2. Service Personalization

The use of IoT-based fitness trackers and mobile applications has enabled Allday Fitness to provide highly personalized services tailored to individual member needs. Members have access to exercise recommendations, progress tracking, and fitness tips, which enhances their overall experience. As one member shared, "I like how the app recommends exercises based on my fitness progress. It feels like having a personal trainer in my pocket."

This reflects findings by Windasari et al., (2021), who noted that IoT devices increase user engagement and motivation through real-time feedback and goal-setting features. Similarly, Parashar et al. (2023) highlighted that AI-driven personalization enhances customer satisfaction by providing relevant and timely recommendations based on individual preferences and fitness data. Such innovations not only improve member loyalty but also strengthen the value proposition of fitness centers.

Additionally, gamification features embedded in fitness applications further enhance user motivation. Pizzo et al. (2021) demonstrated that gamification creates a more engaging experience, encouraging members to maintain consistent participation in fitness programs. The personalized and interactive nature of these services positions Allday Fitness as a leader in delivering cutting-edge fitness solutions.

3. Technology Adoption Challenges

Despite its benefits, technology adoption at Allday Fitness faces challenges such as limited staff skills and high investment costs. A staff member commented, "Learning to use new technology takes time, and not everyone is comfortable with it initially." This is consistent with findings from Dukić et al. (2022), who identified staff training as a critical factor in overcoming resistance to new technologies.

To address these challenges, Allday Fitness has implemented regular training programs to equip staff with the necessary skills for maximizing the benefits of technology. *(Özdemir & Hekim,(2018)* emphasized the importance of such training in ensuring the successful adoption of IoT and AI technologies in organizational settings.

Investment costs also pose a significant barrier. Implementing advanced technologies like IoT and AI requires substantial financial resources, which can be a constraint for fitness centers with limited budgets. Proposals have suggested strategic partnerships with technology providers and the utilization of subsidy programs as solutions. For example, Chin et al. (2022)highlighted that collaborative partnerships can reduce the financial burden of technology implementation while ensuring access to cutting-edge innovations.

4. Open Business Opportunities

The implementation of integrated technology at Allday Fitness not only enhances operational efficiency and service personalization but also opens up new business opportunities. The findings highlight two prominent opportunities: service personalization and the development of an online community platform.

Service Personalization: AI-driven personalization enables Allday Fitness to analyze member data and provide tailored recommendations for exercise and nutrition. This aligns with Parashar et al. (2023), who emphasized that personalized services increase member engagement and satisfaction. For instance, members receive specific suggestions based on IoT-collected data, such as optimal exercise duration and intensity. This fosters a sense of exclusivity and strengthens loyalty. Furthermore, gamification features incorporated in fitness apps enhance member motivation and enjoyment, as highlighted by (Pizzo et al., 2021).

Online Community Platform: The creation of an online community platform represents another avenue for growth. This platform allows members to interact, share experiences, and support one another in achieving fitness goals. As *Dessart & Duclou, (2019)* noted, such platforms not only foster loyalty but also act as marketing tools through word-of-mouth promotion. Members satisfied with their experiences are more likely to recommend Allday Fitness to friends and family, expanding the center's reach and reputation.

5. Challenges and Solutions in Technology Implementation

The adoption of advanced technology comes with challenges, particularly in terms of staff skills and investment costs. Addressing these challenges is crucial for sustainable growth.

Human Resource Limitations: Limited technical proficiency among staff poses a significant barrier to fully leveraging integrated technology. We have implemented regular training programs to address this issue, assisting staff in adapting and maximizing their use of

technology. This aligns with (Petersson et al., 2022), who emphasized the importance of skill development for successful technology adoption.

Investment Costs: High investment costs for technologies like IoT and AI remain a challenge, especially for small and medium-sized fitness centers. Strategic partnerships with technology providers and government subsidy programs can alleviate financial burdens. Allioui & Mourdi (2023) highlighted that such collaborations ensure access to cutting-edge innovations without overburdening resources. Allday Fitness's hybrid business model, combining physical and digital services, further diversifies revenue streams and supports long-term sustainability.

Theoretical and Practical Implications (Expanded)

These findings reinforce the Resource-Based View (RBV) theory, emphasizing the role of unique technological resources as a source of competitive advantage. Beyond operational benefits, technologies like IoT, AI, and cloud computing enable fitness centers to innovate and capture new market opportunities.

From a practical standpoint, fitness center managers should focus on investing in advanced technologies while addressing barriers such as staff training and investment costs. The development of online community platforms and personalized services not only enhances member experiences but also positions fitness centers as leaders in an increasingly digital and competitive industry.

Conclusion

This study highlights the transformative role of integrated technology in the sports industry, particularly at Allday Fitness Soreang. The findings underscore three main contributions: enhancing operational efficiency, enabling personalized member services, and capturing new business opportunities. These advancements align with the Resource-Based View (RBV) theory, which posits that unique technological resources create competitive advantages.

Limitations: Despite its contributions, this study has limitations. Focusing on a single case study limits the generalizability of the findings. Additionally, although we employed triangulation to mitigate this, the reliance on qualitative data may introduce subjectivity.

Impacts: The practical impact of this research lies in demonstrating how integrated technologies, such as IoT, AI, and cloud computing, enhance member satisfaction, streamline operations, and open up innovative business avenues like online community platforms. These insights provide a roadmap for fitness centers to adapt to a rapidly digitalizing industry.

Recommendations: Future research could explore the scalability of these technologies across different fitness centers and regions to validate the findings. Further, a mixed-methods approach incorporating quantitative analysis could provide deeper insights into the long-term impacts on business performance and customer retention. We encourage fitness centers to invest

in regular staff training, leverage strategic partnerships, and adopt hybrid business models to maximize the benefits of digital transformation.

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