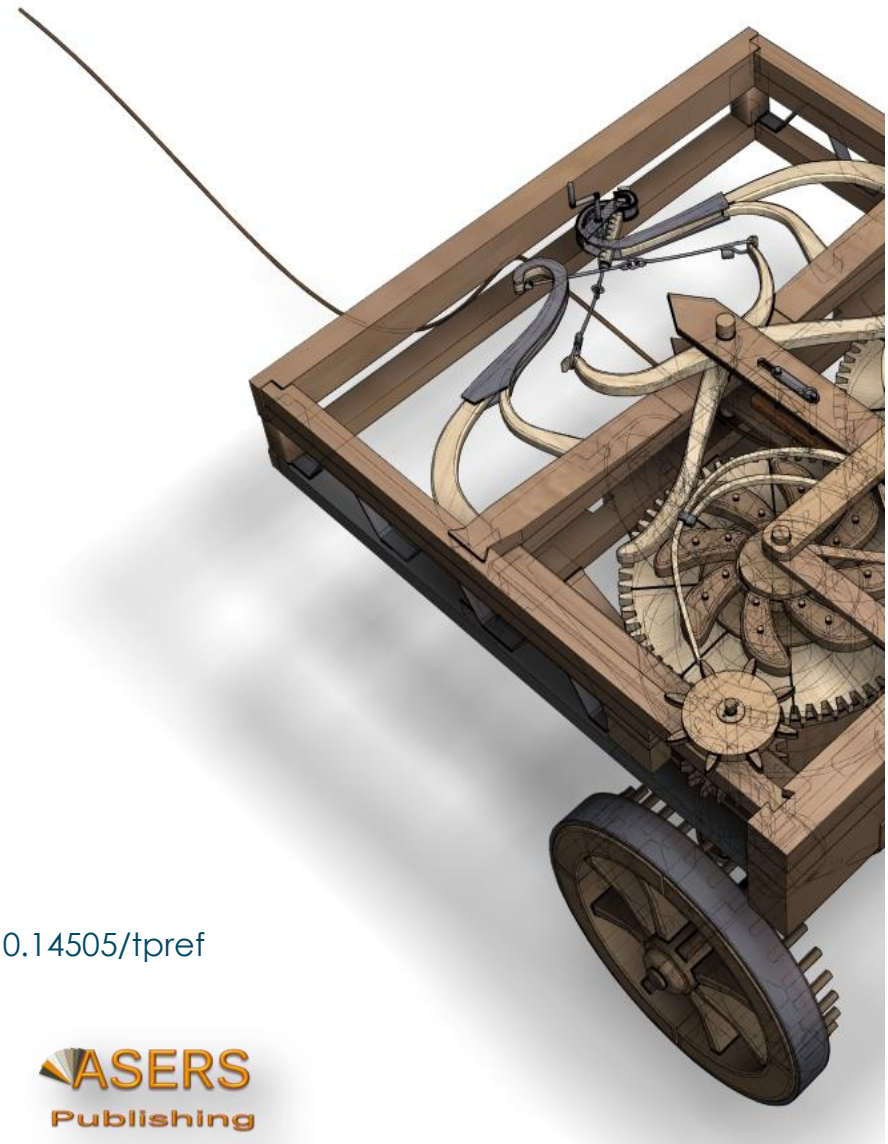
Theoretical and Practical Research in Economic Fields



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Theoretical and Practical Research in Economic Fields

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Impacts and Challenges of Digital Technology on Cooperatives in Bali Province

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Abstract: This study aims to explore the impacts and challenges of cooperatives that use digital technology in the Province of Bali. The relevance of this work is the demand for digitalization of cooperatives by the central government to increase the empowerment of cooperative institutions and the lack of cooperatives that apply digital technology. A qualitative approach was used, and data analysis was conducted using the semantic interpretation method by conducting in-depth interviews using a purposive sample method with 47 cooperative top management who are using digital technology. The basis of this research methodology is organizational theory in the context of digitalization. The object of this work is cooperatives that apply digital technology. Digital cooperatives which are using organizational theory were the investigated objects showing the novelty of this work. It has been found that the impact of the use of digital technology by cooperatives influences increasing business prospects, business continuity, outreach and collaboration. However, it was found that cooperative members who are using mobile cooperatives have low loyalty. The risks faced are still challenging digital cooperatives, and it is recommended that further research be conducted to find out the reasons of cooperatives that have not implemented digital technology services.

Keywords: digital technology; cooperatives; business continuity; outreach; faced risks; digitalization; digital service; collaboration.

JEL Classification: G21; O33; M15; R11; A12.

Introduction

The rapid development of technological transformation to digital transformation has brought drastic changes to society, organizations, agencies, private sector, companies and governments that should be able to be welcoming the era of society 5.0. This of course also has an impact on cooperatives as microfinance institutions. The application of technology is very important for the survival of an organization. However, research on the impact of technology on an organization is still limited.

Previous studies revealed that technology can improve profitability and values of company (Chen, Guo, and Shangguan 2022), able to encourage commercial bank resilience during crises which in turn increases financial stability (Dadoukis, Fiaschetti, and Fusi 2021), able to increase bank customer financial transactions (Carbó-Valverde *et al.* 2020), and able to improve employee skills and performance of small and medium-sized

enterprises (SMEs) (Eller *et al.* 2020). On the other hand, others showed that there are negative impacts of technology implementation including negative impact on corporate innovation performance (2021). Financial technology (fintech) also provided a negative effect on bank performance (2020) and its innovation reduced the profitability and asset quality of Chinese commercial banks in aggregate (2022). It also had a negative impact on the profitability of bank savings in Spain (2012). In addition, there are other studies that showed an ambiguous impact from the application of technology. Cámara *et al.* (2015) confirmed that there is no real evidence to conclude the positive impact of Web 2.0 technology on the operational performance of companies in Spain. Di Vaio & Varriale (2020) also stated that there is no guarantee that the adoption of blockchain technology will improve performance in the aviation industry in Italy. The majority of previous studies have analyzed companies (Kumar *et al.* 2022; Tang, Huang, and Wang 2018; Gillani *et al.* 2020; Martínez-Caro, Cegarra-Navarro, and Alfonso-Ruiz 2020; Singh, Sharma, and Dhir 2021), SMEs (Abbasi *et al.* 2021; Khayer *et al.* 2020; Denicolai, Zucchella, and Magnani 2021; Eller *et al.* 2020), banks (Ha 2022; Dadoukis, Fiaschetti, and Fusi 2021), the airport industry (Di Vaio and Varriale 2020) and external auditors (Manita *et al.* 2020).

In addition, Riaz *et al.* (2022) showed the impact of digitalization on corporate governance in Australia as improved corporate governance with transparent disclosure of information and thwart corrupt practices. Lumi (2020) found the impact of digitalization on human resource management seen from the positive and negative aspects. The positive aspects of digitalization of human resource management are revealed to have created and accelerated many changes, enhanced efficiency and effectivity by facilitating technology in every process includes recruitment, selection, training and development, performance and monitoring (Tongdhamachart & Alwi, 2023). The globalization of international connections, social networks and many other aspects affect training and forms of digital communication with digital platforms. The negative aspects of digitalization are stated to damage the essence of space and time. Moreover, organizations must allocate funds by investing more in the digitalization aspect for every innovation and every method carried out.

Cherkasova & Slepushenko (2021) found the impact of digitalization on financial performance companies in Russia. They discovered that digitalization carried out by companies has a positive effect on company operational efficiency, enabling company management to choose the right strategy in terms of digital transformation, ensuring company competitiveness and contributing to the development of digital innovation. Kiseleva (2020) then described the impact of digital transformation on potential investments in Russian cities. They found increasing digital potential to interact with public authorities, increasing e-business components through business digitization, and the implementation of electronic workflow processes (Al Maani *et al.* 2023).

Lapina (2022) further stated digitalization in the health sector as improved provision of medical care and medical services and optimized health care management. On the other hand, Matoušková (2022) showed the impact of digitalization on the business sector, whereby businesses using more digital modes can earn more revenue which is different to businesses going digitally backwards that will lose customers as they face inconvenience related to cash payments as digital modes of payments are now more preferred by customers.

Furthermore, digital technology has been found facilitating access to various types of information, helping in the development of cooperatives cooperation with customers in Russia and improving the daily life of cooperative members (Kruchinina and Ryzhkova 2020). With regards to agribusiness sector, the introduction of digital platforms helps increasing labor productivity, resource efficiency and effectiveness of cooperation between participants (Shadchenko *et al.* 2022). However, one negative side of digital cooperatives is the lack of effective legal and technical mechanisms to regulate digital cooperative information infrastructure in Russia (Budarin, Chirkov, and Magomedov 2022).

Yet, digitalization of the consumer cooperative system is an important component of the socio-economic development, culture of members, customer and producer cooperatives, as well as guidelines for ensuring the competitiveness of the country and society as a whole (Kartashov *et al.* 2022). There is also an ambiguity of the sharing economy which is found as a new form of consumer cooperatives in the context of digitalization and the need for flexible regulations in each country's economic system (Vorozheykina *et al.* 2022). Moreover, the development of digital cooperatives in Russia makes it possible to improve financial performance, develop crisis management to gain lost profits in 2020 (Nabiyeva *et al.* 2022). Financial models have also been shown in digital cooperative business for the Euro-America and Asia Pacific regions, showing a strong correlation between turnover of cooperative business structures in the Asia-Pacific region and the availability of funds for technology development (Korolev *et al.* 2022).

Rising competition for digital technology services carried out by banking financial institutions requires cooperatives to participate in increasing the application of digital technology services. Under current conditions, digitization is so important that the central government encourages the development of cooperatives through

regulations by issuing government regulations according to the Regulation of the Minister of Cooperatives and Small and Medium Enterprises of the Republic of Indonesia Number 2 of 2017 allowing the digitization of cooperatives and Government Regulation Number 7 of 2021 Article 21 paragraph 1 which confirms that: (a) cooperative empowerment is carried out through innovation and technology and Article 21 paragraph 6, (b) encouraging the improvement of cooperative innovation capabilities to improve work efficiency and cooperative competitiveness (Joko Widodo 2021).

However, the low interest of cooperatives in implementing digital technology services is the motivation for this research to be conducted. Therefore, this study focuses on a qualitative study of the phenomenology of digital cooperatives to contribute to the context of cooperative digitization. The aim of this work is to discuss the impact of cooperatives that apply digital technology and the challenges faced by using organizational theory(Quang & Duc, 2023). The importance of this work is to explore whether the results might be different from previous studies that focused on digital cooperatives. Since there are various types of cooperatives, among others includes, savings and loan, service, marketing, producer, consumer and all-business cooperatives. The contribution of this research is expected to guide the top management of cooperatives to increase the implementation of digital technology services.

Research Problem:

As for the problems of research conducted to determine the role of cooperatives in the Province of Bali, as follows:

1.The impact of implementing digital technology for cooperatives in Bali;

2.Is the application of digital technology for cooperatives able to provide services to businesses and services provided.

1. Literature Review

In the Previous study has shown the impact of digitizing SMEs on increasing employee skills, financial performance, and information technology (Eller *et al.* 2020). Meanwhile, European SMEs undergoing digital transformation showed the impact of digitalization, allocate more resources for experimentation with innovating business models and are more involved in implementing digital business strategies (Bouwman, Nikou, and de Reuver 2019) The impact of digitalization on SMEs was also shown by Takeda *et al.* (2022) in which an increase in the percentage of online sales which in turn increases digital payments. The impact of digitalization on companies can be seen in the increased skills of female employees and salary increases (Lukyanova 2021). Different things can be seen in the impact of digitalization on business-to-business organizations stated by Pagani & Pardo (2017), namely the success of using digital marketing, creating value through integration of resources, development of business networks, supporting the occurrence of new activities, new resource ties, and new actor ties. Digitalization also influences social networks updates for corporate purposes and the performance of knowledge-intensive business service. There are also impacts of digitalization on the banking sector including the existence of strategic partnerships and cooperation between banks and financial technology companies (Elsaid 2021), increased possibility for bank customers to carry out financial transactions through digital channels rather than in physical branches, accelerated digitalization of bank customers, achieved personal and social efficiency gains, increased bank productivity and efficiency (Carbó-Valverde *et al.* 2020). The impact of digitalization on manufacturing companies in Italy was shown to affect the company's export behavior (Cassetta, Meleo, and Pini 2016). Additionally, manufacturing companies in the United States and Europe experienced improved customer experience, reduced time and costs, varied service models and enhanced financial performance (Abou-foul, Ruiz-Alba, and Soares 2021). Yang *et al.* (2021) then stated that there are four main impacts of the adoption of digital technology in manufacturing companies, namely supply chain efficiency, supply chain structure, sustainability and innovation.

Wehrle *et al.* (2021) stated that digitalization affects the purchasing and supply management functions so that it encourages the development of new products at different times and forms, as well as drives the potential role of innovation. The impact of digitalization can also be seen in the service sector such as updating social networks, using social networks for corporate purposes, and having high-level training in using digital technology (Ribeiro-Navarrete *et al.* 2021). There are also other impacts such as changes in work allocation, collaboration, motivation, workload, workplace monitoring, technostress problems, the growth of online fraud, security management, the need for internet regulations, monitoring and data privacy (De', Pandey, and Pal 2020). It can be seen that the impact of digitalization on cooperatives has not been carried out. Therefore, this study was conducted by conducting a qualitative analysis of the impacts and challenges of digital cooperatives in Bali Province in welcoming the era of society 5.0.

Huang *et al.* (2022) stated that society 5.0 was proposed by the Japanese Cabinet to balance economic progress with solving social problems in Japanese society. Society 5.0 aims to put humanity at the center of innovation, leveraging the impact of technology and the results of industry 4.0 with the integration of technology to improve quality of life, social responsibility and sustainability (Carayannis and Morawska-Jancelewicz 2022).

2. Method

Several stages were used in this work. From a population of 5,380 active cooperatives in Bali Province in 2022, the first stage of sample selection was carried out using a purposive sampling method in order to obtain 4,260 active cooperatives that are still operating. The second stage of sample selection was carried out using the accidental sampling method in order to obtain a sample of 47 cooperatives that have used digital technology services. The data collection method was carried out by means of in-depth interviews conducted with the top management of digital cooperatives of 47 people from December 2022 to January 2023. The interview guide consisted of an introduction, agreement and open questions. All interviews were conducted by recording with the consent of the respondents and kept confidential to provide a code for each interview. The average time required for each interview is 45 minutes.

2.1 Research Methodology. Analysis Digital Cooperative Characteristics

Based on field observations, it was found that the majority of cooperatives that apply digital technology in Bali Province belong to the type of savings and loan cooperatives, which are 30 cooperatives, followed by 4 types of all-business cooperatives, 7 types of consumer cooperatives and 6 service cooperatives. Cooperatives using digital technology develop technological innovations by collaborating with vendors of national and local scale technology development institutions with most cooperatives located in Badung Regency. They implement digital technology based on operational and service market needs. As many as 24 cooperatives implemented digital technology during the COVID-19 pandemic and after the pandemic.

Based on the information that we have obtained from the vendor commissioner of the technology development agency of the cooperative, the characteristics of the application of digital technology are the application of technology by recording transactional activities using a computerized system, the use of the mobile collector smartphone application by field officers, availability of a control computer (server), existence of an internet network that connects one computer from one office to another and the use of a cloud-based infrastructure as a server control center. Cloud technology is the use of the internet to access applications, data or services stored or run on remote servers (Artemenko and Zenchenko 2021). Other characteristics according to vendors of digital cooperative services are 24-hour operational services in real time, mobile and browser-based services similar to internet banking that are integrated with third parties in providing services to cooperative members, digital services that are generally provided include account opening online, online loan applications, cooperative member marketplaces, online bank payment points so that they can be used to pay electricity bills, telephone, internet, water, BPJS, and motor vehicle installments. Other mobile services provided by digital cooperatives as informed to us are being able to top up OVO, GOPAY balances, and having an Application Programming Interface so that cooperative members can make QRIS payment transactions, interbank transfers, and can withdraw money using ATMs in all banks.

Table 1. Types of Digital Cooperatives in Bali Province

Type of Cooperative	Quantity
Service	6
Consumer	7
All Business	4
Savings and Loan	30
Total	**47**

Source: 2023

3. Research Results

Based on the conducted interviews, it was found that there are 47 people working as top management of the cooperative who have agreed to be interviewed with the majority being male comprised of 40 people and 7 women (Table 2). Based on the field findings, it is known that if women get a place to manage an organization, they become the top management of an organization. This was disclosed by RESP12 based on the results of

meetings held by the management as a form of gender equality, and in terms of educational level and competency aspects, RESP12 has been assigned as manager since 2021.

Table 2. Gender of Respondent

Gender	Quantity
Male	40
Female	7
Total	47

Source: 2023

Most respondents have an undergraduate education level of 42 people, 4 people with postgraduate education and 1 person with a diploma education (Table 3). This shows that the level of undergraduate education possessed by the top management of the cooperative has the competence to manage the organization, as is the case for higher education levels than undergraduate. The importance of the level of education will affect performance as a tool for adjusting tasks and jobs with the abilities and skills possessed by top management.

Table 3. Level of Education of Respondent

Level of Education	Quantity
Diploma degree	1
Bachelor's degree	42
Postgraduate degree	4
Total	47

Source: 2023

There are 10 respondents working as chair of the Cooperative Board, 2 people as Chairman of the Board of Cooperatives as well as General Manager, 1 person as Secretary of the Board of Cooperatives, 1 as the Deputy Chairman of the Board of Cooperatives and as 33 as manager (Table 4). The composition of the management of the cooperative consists of the Chairperson, Deputy Chairperson, Secretary and Treasurer. If the cooperative has good and large organizational development, a cooperative operational manager is appointed specifically by the management. This is certainly in accordance with the ability of institutions to provide remuneration in the form of salaries to managers. However, if this management has not been able to be carried out, then usually the Chairman of the Board also works as the Manager so that in his capacity the manager is always referred to as a manager while the capacity to establish a policy, regulations is the authority of the board, thus it is called the Chairperson of the Board. Cooperatives that have large assets generally have a Chairman and appoint one person as a manager.

Table 4. Position of Respondent

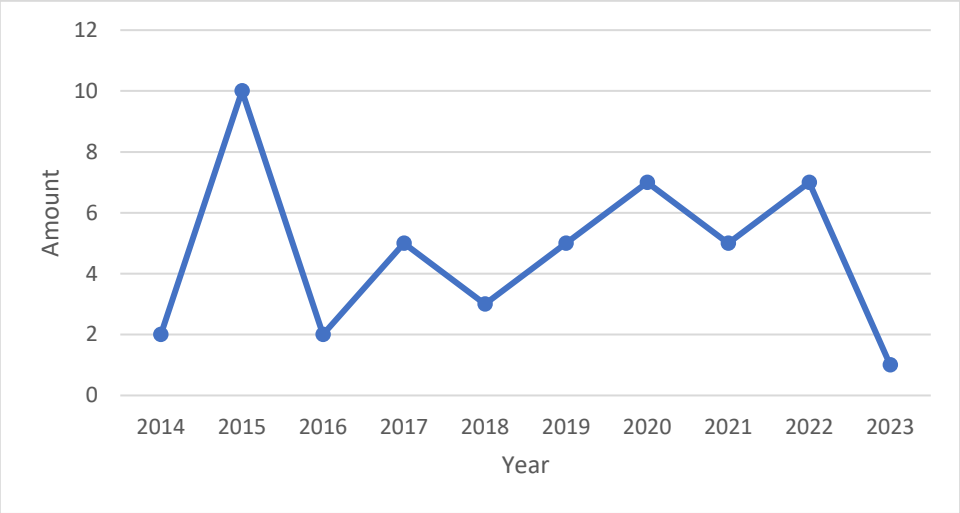
Position	Quantity
Chairman of the Cooperative Management	10
Cooperative Chairman and General Manager	2
Executive Secretary	1
Deputy Chief Executive	1
Manager	33
Total	47

Source: 2023

Based on the conducted interviews, information was obtained about the application of digital technology by cooperatives from 2014 to 2023 (Figure 1). In 2014, 2 savings and loan cooperatives applied digital technology. Subsequently, 1 service cooperative, 2 consumer cooperatives, 2 multi-business cooperatives and 5 savings and loan cooperatives implemented digital technology in 2015. In 2016, there were 2 savings and loan cooperatives that applied digital technology. There were then 1 service cooperative, 2 consumer cooperatives, 1 multi-business cooperative and 1 savings and loan cooperative that implemented digital technology in 2017. There were as many as 3 savings and loan cooperatives in 2018 that have applied digital technology and 5 of them in 2019. Furthermore, 5 savings and loan cooperatives, 1 all-business cooperative and 1 service

cooperative that that have implemented this technology in 2020. In 2021, there will be 4 savings and loan cooperatives and 1 consumer cooperative that will implement digital technology. In addition, there will be 3 savings and loan cooperatives, 3 service cooperatives and 1 consumer cooperative that utilize digital technology in 2022. Ultimately, there will be 1 savings and loan cooperative that implement digital technology in 2023. It was also obtained that 15 cooperatives have collaborated with local scale digital technology development institutions while 32 others have made partnerships with third parties on a national scale.

Figure 1. Period of Digital Technology Application by Cooperatives in Bali Province



4. Discussions. Impact of Digital Cooperatives

Cooperatives that apply digital technology in operational activities and services to their members have impacts and challenges which are the main categories describing the conditions that provoke top management of cooperatives to use digital technology (Damayanti *et al.* 2022). The impact of cooperatives applying digital technology is that there are business prospects that can be developed through cooperative mobile application services, business continuity, increased range of mobile cooperative services, and collaboration with other parties. The challenge faced by cooperatives is a risk that can be avoided by cooperatives including data security for cooperative members when using mobile applications and misuse of money by employees which can be done by implementing digital technology services through collector mobile applications.The use of digital technology has provided business prospects through cooperative mobile applications for cooperative members include increased business of cooperative members through cooperative merchants, increased volume of cooperative business and the circulation of money within cooperatives.

> “By using digital technology through the mobile cooperative application, our cooperative is able to help the businesses of cooperative members by providing a marketplace as well as online marketing to all cooperative members. As a result, cooperative members can make purchase transactions and direct payments online through a mobile application.” (RSP4)

> “I think negatively about cooperative members because of the lack of cooperative members who are willing to take advantage of the online merchant facilities that our cooperative provides through our mobile application. This can be seen from the fact that online transactions of our members are minimal in for daily needs through merchants.” (RSP40)

> “Various types of cooperative member businesses that appear in the mobile cooperative application have a positive impact on cooperatives which can be seen from the increase of cooperative business volume in each period.” (RSP15)

> “Digital transactions carried out by cooperative members through the mobile cooperative application make very high cashflow, which is reflected in the increasing number of cooperative members' savings every day. Cooperative members increase their savings balance so they can use their digital wallet through the mobile cooperative application service that we provide.” (RSP5)

Mobile cooperative services provided by cooperatives have a positive impact on the sustainability of cooperative businesses so that public trust in cooperatives increased. Furthermore, mobile application users of all ages, and cooperatives innovate mobile application services to meet the needs of cooperative members.

> "I had negative thoughts about the implementation of mobile cooperative services at our cooperative operational locations, because competition was quite high with other financial institution sectors. To my surprise, people's trust has increased after we implemented mobile cooperatives and we have an increase in new cooperative members." (RSP14)

> "I cannot stop thinking, with the low interest of cooperative members in utilizing the mobile cooperative services that we provide. We are making every effort to motivate cooperative members. However, this application is not popular for young people, whose also called the millennial generation or generation Z." (RSP2)

> "Based on my observations from the system, users of the mobile cooperative application consist of members of the cooperative who have years of birth from 1964 to 1998." (RSP31)

> "After we implemented mobile cooperative services, the growth of cooperative assets has increased every year." (RSP20)

> "I do not expect our asset growth to not increase, even though we have been trying to implement a mobile cooperative application service." (RSP13)

Mobile cooperative services have another positive impact by increasing the outreach of cooperatives which can be seen in the younger generation joining cooperatives which is done by meeting the needs of cooperative members and ensuring the availability of high-speed internet connections at cooperative operational locations.

> "Based on the board meeting, supervisors and management of the cooperative, I was assigned to innovate mobile application services in 2020. The bonus I received for this effort increased the credibility of our cooperative, as seen from the increasing number of savings of cooperative members every day." (RSP1)

> "It is hoped by the management team that the cooperative will be able to meet the needs of cooperative members by using the mobile cooperative application. However, we have to educate members because more than half of cooperative members have not used the mobile cooperative application that we have provided." (RSP28)

> "I was very happy to hear what the members of the cooperative said during the annual cooperative member meeting held last year. Cooperative members said that they are very proud of cooperating and their needs are met with the availability of the cooperative mobile application." (RSP44)

> "Members of the cooperative appealed to me for the cooperative to add mobile cooperative service facilities." (RSP43)

> "With the availability of a high-speed internet connection, the cooperative is able to reach members through the mobile cooperative application." (RSP38)

> "The availability of high-speed internet connection in the operational area of the cooperative greatly affects the outreach of mobile cooperative services by cooperative members. Since a high-speed internet connection entered the cooperative's operational area, only then were we able to implement the mobile cooperative application." (RSP3)

The impact of the use of mobile cooperatives felt by cooperatives is the creation of collaborations that can be carried out with third parties, banking financial institutions and the central government. Thus, the mobile cooperative services provided to cooperative members vary among the digital cooperatives that have been encountered.

> "I cooperate with third parties including technology development agencies and banking institutions to develop mobile cooperative application service facilities. Thus, the mobile cooperative application is useful for cooperative members." (RSP45)

> "I have increased cooperation with more than one banking financial institution to improve mobile cooperative service facilities. Therefore, our cooperative is the first cooperative to implement an Application Programming Interface so that it can take advantage of banking financial services. After implementing standardization of payments using the QR Code, cooperative members will enjoy the QRIS mobile cooperative service facility that is easier, faster and secure. Our mobile cooperative application can also be used to make payments between merchants using the QRAM application (QRIS Inter Merchant). Cooperative members can also withdraw their savings in our cooperative through ATMs of all banks, as well as make transfers from cooperative virtual accounts to other bank accounts." (RSP27)

> "I made a breakthrough in collaboration with the central government and local governments, through a very strict selection of several stages. Finally, our cooperative has been distributing People's Business Credit since 2019. Our cooperative won a national award as the best People's Business Credit distributor in 2021 in the category of non-bank financial institutions." (RSP37)

The challenge faced by cooperatives in implementing digital services is that there are risks that can be avoided, including data security for cooperative members and misuse of money by employees.

> "Cooperative members are required to enter a username and password first for every transaction made by cooperative members through mobile application and all transaction data are stored on the cloud server." (RSP 31)

> "Cooperative members will receive two security transaction verifications, namely a password and One Time Password (OTP) code to maintain the confidentiality of cooperative member data when transacting using our mobile application. Our password has a number that is always changing so that it is not easily misused by other parties. There is also an OTP code which is a secret code. Cooperative members will receive notifications via the Telegram application after the transaction through the mobile cooperative is successful." (RSP32)

> "I think negatively about the security of cooperative members' data with the rise of hackers at banking financial institutions and skimming at regional banks." (RSP47)

> "I had negative thoughts about the misuse of cooperative members' money by employees more than once. However, the use of mobile collectors can minimize the occurrence of misused money since every transaction made by cooperative officers in the field will generate automatic notifications via Telegram application." (RSP27)

> "The aim of our cooperative is to implement mobile cooperative services in order to minimize mistakes made by employees on purpose. Mistakes made by cooperative employees will certainly affect the credibility and provide bad image of the cooperative in society." (RSP47)

> "Mobile cooperative application makes it very easy for cooperative members to transact online and it minimizes misuse of members' money which is generally carried out by cooperative employees." (RSP42)

This research contributes to findings related to the impacts and challenges of cooperative digitization. It was found firstly that the impact of the digital cooperatives increased cooperative business prospects. This is in accordance with the findings of Verkijika (2018) that all e-commerce giants in Cameroon have increased business prospects. Yang *et al.* (Yang, Fu, and Zhang 2021) then showed that the use of digital technology affects the prospects and business strategies of manufacturing companies. Matouškova (2022) also stated that digitalization has an impact on business prospects. Farah *et al.* (2018) and Bhatiasevi (2016) supported this finding by stating that business prospects affect the use of mobile banking. This is also in agreement with the finding of Chopdar *et al.* (2018) who have found that business prospects affect the use of mobile shopping. However, the research findings of Slade *et al.* (2015) claiming digital technology has no impact of business prospects.

The second impact of digital cooperatives is increasing business sustainability. Digital financial technology influences the sustainability of use (Artemenko and Zenchenko 2021). Mobile application service innovation uses QR codes according to Dudin *et al.* (2021), which are codes used to make payments such as in e-commerce systems as a form of digital technology application services. Carayannis & Morawska-Jancelewicz (Carayannis and Morawska-Jancelewicz 2022) then stated that society 5.0 and industry 5.0 have an effect on the

sustainability of higher education. Hospital business continuity is also claimed to be influenced by digital technology, big data and artificial intelligence (Benzidia, Makaoui, and Bentahar 2021). Yang *et al.* (2021) further revealed that the use of digital technology affects supply chain sustainability. However, the research findings of Mathess & Kunkel (2020) have debated the effect of digitalization on business sustainability.

The third impact of digital cooperative is the enhancement of the outreach of cooperatives. This is in accordance find the finding of Errol S. van Engelen (2019) who stated that if information and communication technology is implemented effectively to provide innovative financial services to poor people living in developing countries, it will increase their outreach. It was also stated that the development of digital financial technology will increase the availability, quality and outreach of financial services (Artemenko and Zenchenko 2021). This also supported with the claim that innovative practices are urgently needed so that microfinance institutions can better serve the poor (Mia and Chandran 2016). The research findings of Alam *et al.* (2018) further showed that the advantages of digital technology will help create stronger community relations with a wider outreach to people and business groups. Voorrips *et al.* (2012) declared that mobile financial services significantly enhances the operational outreach of microfinance institutions. Similar view was expressed by Kigen (2011) that many microfinance institutions realized an increase in transaction volume as a result of the introduction of mobile banking. Srivastava (2013) also claimed that mobile banking in India serves as a powerful tool for increasing financial inclusion. Thus, banking services can reach untouched populations. However, financial institutions in Cameroon are more focused on generating profits, rather than reaching the poorest of the poor in society (Shu and Oney 2014) and Lopatta *et al.* (2017) stated that broad outreach has no effect on a sustainable economic and financial system.

The fourth impact of digital cooperative is collaboration with various parties, from the private sector, central government to local governments. Advances in information technology are the main foundation for conducting e-collaboration that connects suppliers with international customers (Bryan Jean, Sinkovics, and Kim 2014). The use of technology influences supply chain collaboration to achieve integration with organizational partners (Wu and Chiu 2018). Similarly, it was expressed by Alsaad *et al.* (2018) that collaboration is the key word for getting value from information technology in the supply chain. Implementation of e-collaboration among SMEs found to facilitates collaborative supply chain success enabling organizations to gain competitive advantage (Chan, Chong, and Zhou 2012). However, van den Broek & van Veenstra (2018) revealed that big data collaboration needs to balance innovation that must comply with data protection regulations in the European Union and there are several considerations for implementing integrated communication and collaboration technology among 50 countries (Silic and Back 2016).

The challenges faced by digital cooperatives are the risks faced including security and privacy issues which are obstacles for providers, designers and developers of online banking services (Alkhatib and Alaiad 2016). The development of digital technology also influences risks reduction, costs in the financial sector and ensuring security in the use of financial technology (Artemenko and Zenchenko 2021). The results of the study by Ejdys *et al.* (2019) confirmed that the most important factor that forms trust in technology is the perceived level of security. In addition, a lack of understanding and concern for data security and privacy can prevent SMEs from realizing business value (Perdana *et al.* 2022). Thus, user security and privacy are critical to the adoption of mobile banking applications in Lebanon (Merhi, Hone, and Tarhini 2019). However, Hwang & Choi (2017) showed that organizations that have low innovation will negatively affect the security of information systems. It is suggested that there is a need for the availability of regulations set by the government relating to digital financial transactions provided by cooperatives, the availability of procedure manuals for implementing digital services in cooperatives and the availability of high-speed internet connections to implement digital technology services.

Conclusions

This study explored the impacts and challenges posed by cooperatives that implement digital technology in the Province of Bali. By using accidental sampling method, it was found that 47 cooperatives were willing to be interviewed. It has been found that cooperatives that implement digital services consist of service, consumer, multi-business and savings and loans cooperatives. The impact of digital technology implemented by cooperatives in the Province of Bali was found to have an impact on increasing business prospects, business continuity, the range of mobile cooperative services that can be carried out especially for all-business and service cooperative types. The existence of collaboration was found as another impact for all types of cooperatives that were the respondents of this study. There are also risks that come from internal and external cooperatives as challenges faced by all types of cooperatives.

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Credit Authorship Contribution Statement

Surya Dewi Rustariyuni: Conceptualization, Investigation, Methodology, Project administration, Software, Writing – original draft, Supervision, Data curation, Validation, Writing – review and editing.
M. Pudjihardjo: Conceptualization, Investigation, Methodology, Project administration, Software, Writing – original draft, Supervision, Data curation, Validation, Writing – review and editing.
Full M. Umar Burhan: Conceptualization, Investigation, Methodology, Project administration, Software, Writing – original draft, Supervision, Data curation, Validation, Writing – review and editing.
Dias Satria: Conceptualization, Investigation, Methodology, Project administration, Software, Writing – original draft, Supervision, Data curation, Validation, Writing – review and editing.

Declaration of Competing Interest

The authors state that no competition for financial interests or personal relationships could influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have not used generative AI and AI-assisted technologies during the preparation of this work.

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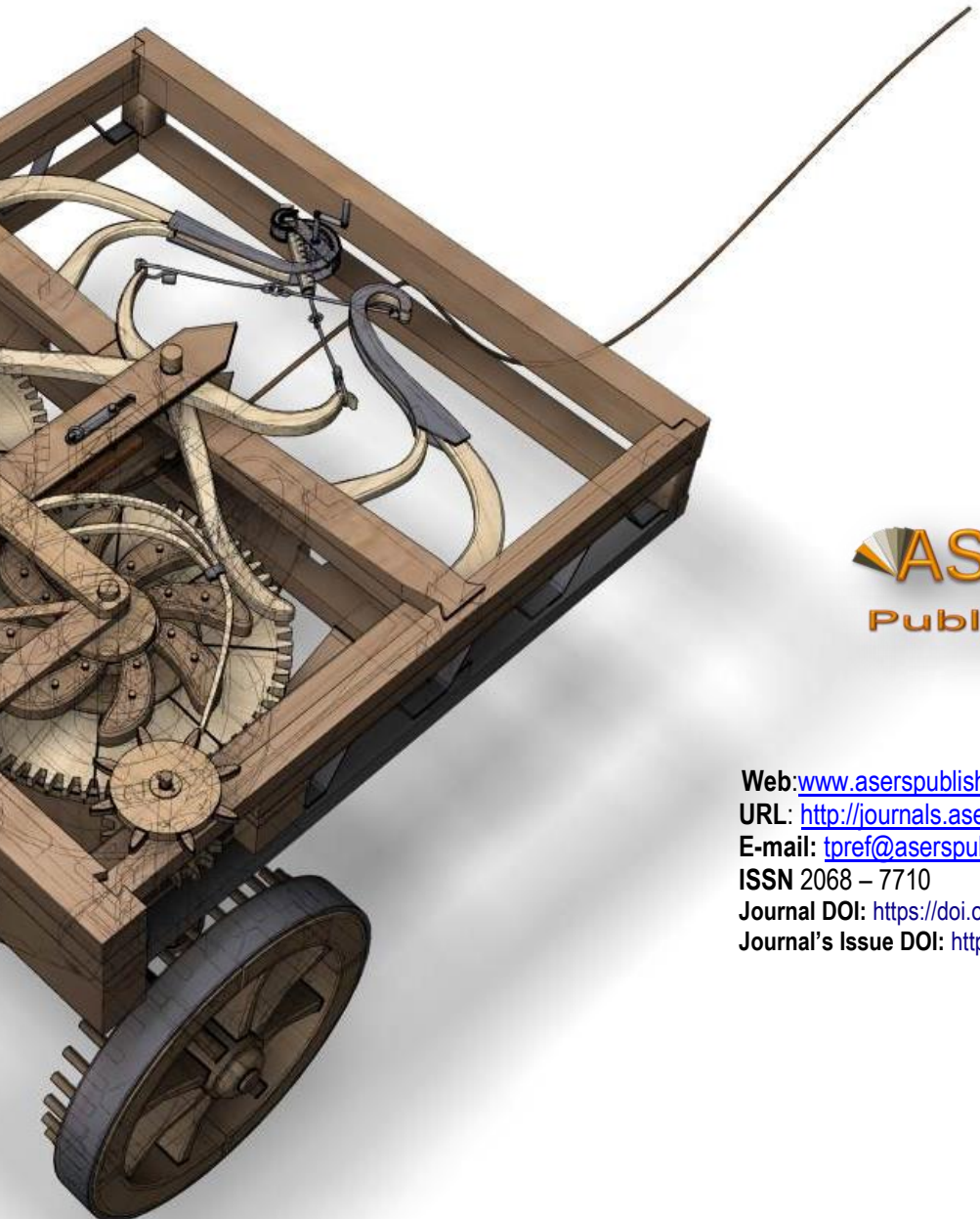

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