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# Church Sustainability: Exploring Online Technologies through the Lens of System Dynamics

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## Abstract

*Online technologies such as social media and videoconferencing platforms have changed the way church leaders access information and communicate with congregants. The paper investigates the value of online technologies in creating church sustainability using system dynamics. Exploring Seventh-day Adventist (SDA) as the case study, the researchers interviewed 12 religious leaders. The results showed that church leaders were using online technologies to create online communities within their congregations which were crucial for addressing the communication and informational needs of various church leaders as well as aiding the retention of church members. The study concludes that online technologies have the potential to sustain religious organisations. The study provides insight to the church leaders regarding the value of online technologies in church sustainability.*

**Keywords:** Online technologies; Online communities; Social media; Religious leaders & organisations; Church sustainability; Member retention; System dynamics; ICT

# 1 Introduction

Owing to the developments in information technology (IT) infrastructure and widespread diffusion of internet connectivity across the globe, several online technologies have been introduced, enabling users to access information and communicate over the internet (Dwivedi *et al.*, 2020; Yan, Filieri and Gorton, 2021). These online technologies have been used in different sectors such as education, health, and religious organisations (Revere and Kovach, 2011; Arthur and Rensleigh, 2015). Religious organisations such as churches have used online technologies to conduct activities such as evangelism (Amanze and Wogu, 2015). Online technologies have enabled web visitors access to an online environment where they can access valuable content such as pastor's notes, calendar activities including calendly app, pastoral analytics, and devotions (Arthur and Rensleigh, 2015). The use of online technologies in religious organisations has enabled web visitors with access to information on, for example, doctrine and beliefs, as well as room to participate in religious activities such as prayers and homiletics (Young, 2004). This shows that online technologies can expose web visitors to information on religious matters. They also enable visitors to partake in religious practices the same way they would do in offline churches.

Much of the research conducted on religious organisations focuses on church membership growth and worship services (Omotayo, 2017; Matobobo and Bankole, 2020). However, there are few research studies that have focused on technologies for sustainability in religious organisations. Therefore, it is important to understand how technology sustains churches since religion plays an important role in people's lives, though in most cases it is seen as an insignificant cultural group that has no bearing on technological use or development (Campbell, 2005).

Because of the use of online technologies by some religious organisations, it is worth assessing what potential online technologies hold to sustain churches. This is influenced by the rise of online technologies among religious organisations (Struzek *et al.*, 2019; Bryson, Andres and Davies, 2020). In an organisation, sustainability refers to the adoption of strategies and activities that meet the needs of an organisation and its stakeholders while protecting, sustaining, and enhancing the human and

natural resources that will be needed in the future (Labuschagne, Brent and Van Erck, 2005). Transition to organisational sustainability is a “long-term, multi-dimensional, and fundamental transformation process, which establishes that a socio-technical system shifts more toward sustainable modes of production and consumption” (Jo, Kim and Lee, 2021). Religious organisations have sociological aspects that include institutional structure, spirituality of members, membership growth, worldview, and religious routines (Koehrsen, 2018; Labuschagne, Brent and Van Erck, 2005). For this study, church sustainability refers to the ability of the church to stand for its cause and objectives in every situation and at all times. The findings of this study highlight the value of online technologies in sustaining religious organisations through member retention as well as in addressing the needs of church leaders.

The rest of the article is structured as follows: Section 2 discusses the literature reviewed; Section 3 describes the research method, while Section 4 presents the research findings, and Section 5 discusses the findings. Section 6 then concludes the paper.

## **2 Literature review**

For this study, online technologies encompass social media sites (e.g., Facebook, Twitter), messaging applications (e.g., WhatsApp), media sharing (e.g., YouTube, Tik Tok), and video conferencing (e.g., Zoom, Skype). The rapid rise of online technologies presents some tremendous opportunities in various sectors such as education, health, and religion. For example, in education online technologies can foster student engagement in the learning process, which could be beneficial to many students and which leads to a decrease in attrition, enhancing learning outcomes and improving student satisfaction (Revere and Kovach, 2011). In religious organisations, the use of online technologies could be beneficial as believers stay up to date on whatever will be happening, and this may encourage the involvement of the congregation in church functions (Arthur and Rensleigh, 2015).

A study by Matobobo and Bankole (2021b) evaluated the use of social media, in particular electronic word of mouth (eWOM) in religious organisations and the results showed high levels of social media use in areas of advertising, promotion of church

programs, communication, and evangelism. Various forms of communication may be used by people in the online environment, and these include emails, instant messaging (IM), and short messaging systems (Arthur and Rensleigh, 2015). The perceptions of members about technology in religious organisations has also been studied in-depth (Witman and Sparkman, 2010; Chiluya, 2012; Frost and Youngblood, 2014). Frost and Youngblood (2014) used ANOVA and MANOVA analyses to show a statistically significant difference in congregation size based on online religion usage. Furthermore, the research by Matobobo and Bankole (2021a) assessed the informational needs of church leaders using qualitative data and an e-dashboard was developed to best serve the church communities and their leaders to make informed decisions in this dynamic environment. There is, however, limited, if any, research studies that have assessed online technologies such as online communities as tools for sustaining religious organisations. It is beneficial to assess the impact of online technologies on the different types of religious organisations and religious activities to ensure that their primary mission is being achieved (Witman and Sparkman, 2010).

A study conducted by Corley (2018) considered relationship building, prayer, assimilation, and hospitality as the most important functions facilitated by church leaders to attract and retain church membership. A study by Arn (2007) further emphasised a genuine relationship of caring, listening, sharing, and trusting between Christians and non-Christians. Therefore, it is important to understand how online technologies can be used to support the factors that affect membership and retention that are highlighted above (Corley, 2018).

Retention of members is a challenge in religious organisations. For example, a 2007 ANN news story reported that close to 28 Adventists leave the church for every 100 who join (Ravhengani, 2010). Furthermore, the ANN news reported that between 2000 and 2005 the SDA church baptised more than 5 million people and lost nearly 1.4 million (Ravhengani, 2010). The paper uses system dynamics to investigate the value of online technologies in sustaining religious organisations in member retention as well as addressing the communication and informational needs of church leaders.

System dynamics is an approach used to describe and simulate dynamically complex issues through the structural identification of feedback and delay processes that drive

system behaviour (Walters *et al.*, 2016). It provides a means for understanding complex problems, which in turn informs the way decision-makers navigate complex decision-making processes (Walters *et al.*, 2016). System dynamics draws either qualitative or quantitative methodologies or both to analyse system behaviours over time (Nabavi, Daniell and Najafi, 2017). Qualitative modelling is applied in situations where the end goal of the modeller is to develop causal loop diagrams (CLD) while quantitative modelling is used in situations where the end goal is to model and simulate the dynamic effects of factors and their interaction using Stocks and Flows diagrams. In this paper, Vensim software was used to create CLD.

### **3 Research method**

Qualitative research was conducted using a single case study approach to understand how online technologies have sustained religious organisations. A case study is a “research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context” (Crowe *et al.*, 2011). The study adopted an interpretivist philosophical paradigm to explore the realities being investigated. This was because a researcher’s worldview guides the research and influences how it should be studied (Denzin and Lincoln, 2005). Interpretivist research is subjective as it is based on the researcher’s interpretation and view of the world.

The researchers collected data from 12 SDA leaders (3 elders, 3 treasurers, and 6 pastors) using semi-structured interviews. These church leaders were telephonically interviewed, and the interviews were recorded with permission from the participants. The leaders were chosen based on their experience in church leadership; for example, all pastors had at least 5 years of pastoring experience. The researchers used church websites to locate participants, and emails were sent requesting them to participate. Participants with experience in church leadership and exposure to church technologies were selected for interviews. Each participant was then given an information sheet and consent form before data collection so that they could familiarise themselves with the study. Participation in the study was voluntary.

The recorded interviews were transcribed verbatim for analysis. Each interview script was given a unique code ranging from P01 to P12 to identify each participant. No

personal information of participants was included in the scripts. The scripts were analysed using Atlas ti 8 software. To analyse the data, the study used thematic analysis following the six steps suggested by Braun and Clarke (2006). The six steps require the researchers to (1) become familiar with the data, (2) generate initial codes, (3) search for themes, (4) review themes, (5) define themes, and (6) prepare a report.

To ensure that findings meet the criteria of trustworthiness, credibility, transferability, dependability, and confirmability, the prolonged engagement strategy suggested by Korstjens and Moser (2018) was used. The prolonged engagement strategy enabled the researchers to ask follow-up questions and it encouraged the participants to support their statements with examples. Member checking was achieved by sharing all transcripts of the interviews with the participants to get their feedback. This helped the researchers with confirmation of the transcriptions and the interpretation. Dependability ensures that the analysis process is in line with the thematic analysis technique. The authors compared the analysis results with the raw data to see if these aligned. To strengthen the research findings, the researchers included rich verbatim descriptions of participants' experiences (Noble and Smith, 2015).

## **4 Research findings and model development**

This section presents the research findings under Section 4.1. Section 4.2 presents the causal loop diagram for church sustainability.

### **4.1 Themes generated**

The research findings are presented under three themes, namely support for church leaders, support for church members, and challenges within online communities.

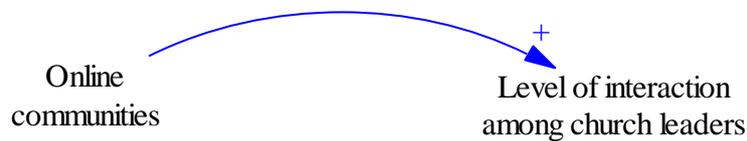
#### **4.1.1 Support for church leaders**

The findings show that online technologies have enabled church leaders to create online communities that support different needs of the church. Online technologies were used to form online communities that meet the needs of different church communities. All participants were part of various online communities within their respective assemblies. This shows a high level of usage of online technologies in addressing the church needs of leaders and members. Participants showed the need to

regularly engage as a community of leaders at different levels and to keep the members engaged. Participant P01 showed the importance of online communities of leaders within a church by saying:

*... for example, we have a WhatsApp group where all departments are, where announcements and important discussions are held. So, this keeps everybody in the loop. Imagine if we did not have the technology, the amount of effort and difficulties that I would have to go through to make sure that I spread whatever message that I want to spread to all the different departments.*

Participant P10 said, “I use WhatsApp groups every day for communication with the elders.” This shows that online communities improve the level of interaction among church leaders as shown in Figure 1.

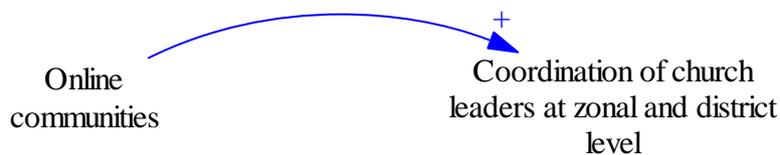


**Figure 1. The causal effect of online communities on the level of interaction among leaders**

Participants further showed that online technologies were not only being used to meet the communication needs of local leaders' congregations but also those at zonal and districts levels. This was highlighted by participant P08 who said:

*There is a zonal WhatsApp group also where they communicate the meetings for elders and so on. And there is another WhatsApp for the district, which is used in preparation for the camp meetings and so on; it's very easy to communicate.*

This shows that online communities can improve the coordination of leaders at zone and district levels as shown in Figure 2.



**Figure 2. The causal effect of online communities on the coordination of church leaders at different levels**

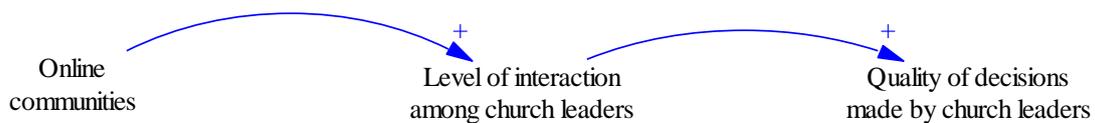
Online technologies have changed the way church leaders discuss church issues, and vote on issues. They have also changed the frequency of the discussions. Most

participants showed that they rarely relied on physical board meetings. Participants showed that they could navigate better in this dynamic environment using online technologies. This was indicated by participant P10, who said:

*If we do not use or encourage the use of social media what will happen is that we will have to rely on traditional methods, which sometimes are time consuming; for example, to wait for a church board that will take time to deal with a matter while we are able to just quickly table it and get people`s opinion and vote on the matter in our WhatsApp groups.*

Participant P02 also said, “*Now we take decisions on WhatsApp chat groups so board meeting decisions can be made quickly*”. This shows the effectiveness of social media groups to church leaders.

Participants were also excited about the use of online technologies as they could discuss important church issues in a timely manner. This was indicated by participant P04 who said, “*We can discuss important issues via WhatsApp; we can share information on email as well as just communicating*”. The use of online technologies enables church leaders to prepare for their meetings as the meeting agenda could just be sent to their WhatsApp groups well in advance. Participant P08 said, “*Before the meeting, we send the agenda through the WhatsApp, a typed one so that they can see what is on the agenda for the church board, the business and the district*”. Figure 3 shows the causal effect of online communities on the quality of decisions made by church leaders when there is a high level of interaction among church leaders.



**Figure 3. The causal effect of online communities on the coordination of church leaders at different levels**

#### **4.1.2 Support for church members**

Besides supporting decision-making, church leaders could interact better with the church members through online technologies. Church leaders showed that the use of online technologies in the religious environment had enabled them to minister better to the spiritual needs of their congregations. This was supported by participant P04 who said:

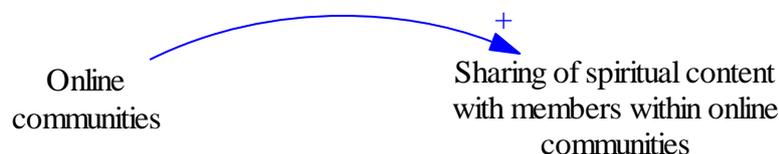
*I'm the one who set up that one, as well as the WhatsApp church group, which I use to share all my pictures, my PowerPoint presentations, and sermons that I preach elsewhere I also share with all the other people.*

Participant P08 said, “*Sermons get recorded on WhatsApp and they know if say it’s a revival week, we would be having 7 messages that are recorded that are WhatsApp friendly then we send to them on WhatsApp.*” The use of WhatsApp enables church leaders to address the spiritual needs of their congregations.

Through online technologies, church leaders had the privilege to share spiritual messages with their members in these groups without waiting for physical services. This was indicated by participant P01 who said:

*These days I am enjoying the book ‘Steps to Christ’, I think Chapter 10 which talks about the privilege of prayer. After reading, I easily generate messages from there and send them to 5 or 6 people or 5 or 6 groups and that way I find that it is more effective to reach people because everyone has a phone on them and everyone can access these messages.*

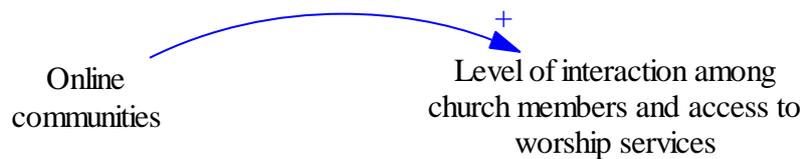
Figure 4 shows the causal effect of online communities on the sharing of spiritual content with members within online communities.



**Figure 4. The causal effect of online communities on the sharing of spiritual content with members**

Church leaders also showed that online technologies were necessary for their daily interactions with members of their respective congregations. Participant P10 said, “*So I use it most of the time; we do that with the churches, like my churches, they have their own Facebook Group so that we can interact daily.*” Church members are kept informed of the church programmes in these online communities being used by church leaders. Participant P12 highlighted this by saying, “*Our WhatsApp group has one hundred and something members, a lot of communication for advertisement and also to invite people for church activities*”. This brings unity and cohesion among the church members and leaders.

Besides online communities, church members were able to conduct meetings and services on virtual platforms such as ZOOM. The use of these platforms helped in situations where it was difficult for members to meet. Participant P07 said, “*It was hard for us to meet on Fridays and discuss the Sabbath lesson with the teachers so I introduced them to ZOOM where we now discuss the lesson online*”. Figure 5 shows the causal effect of online communities on the level of interaction among church members.



**Figure 5. The causal effect of online communities on the level of interaction among church members**

#### **4.1.3 Challenges within online communities**

While there are immense benefits of using online communities within a religious context, some members have not understood its importance. This hinders the use of these technologies within religious organisations. Participant P10 said:

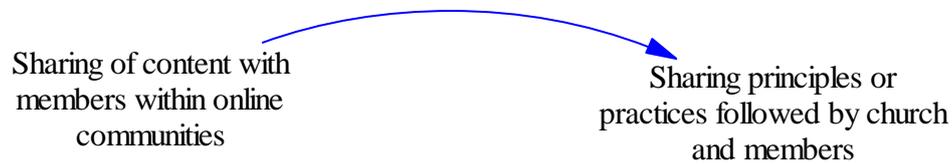
*They did know the importance of how WhatsApp allows us to communicate effectively and better with our church members and with one another about what is the program coming in the following week, what is happening in the community, all of those things.*

These online communities tend to be abused by other people as they are used for purposes other than the intended.

It also emerged that sometimes it is difficult to control the use of these technologies. Participant P04 said:

*For example, on WhatsApp groups, the church sets a WhatsApp group but within that group, it is a no man`s land, we are trying to use it as a platform to share evangelism, then you see political things and jokes are also being shared; so, those are the challenges we face.*

This requires church leaders to implement policies that govern sharing of content within these communities. Sharing of content with members in online communities is affected by the principles or practices of the church leaders and members as shown in Figure 6.

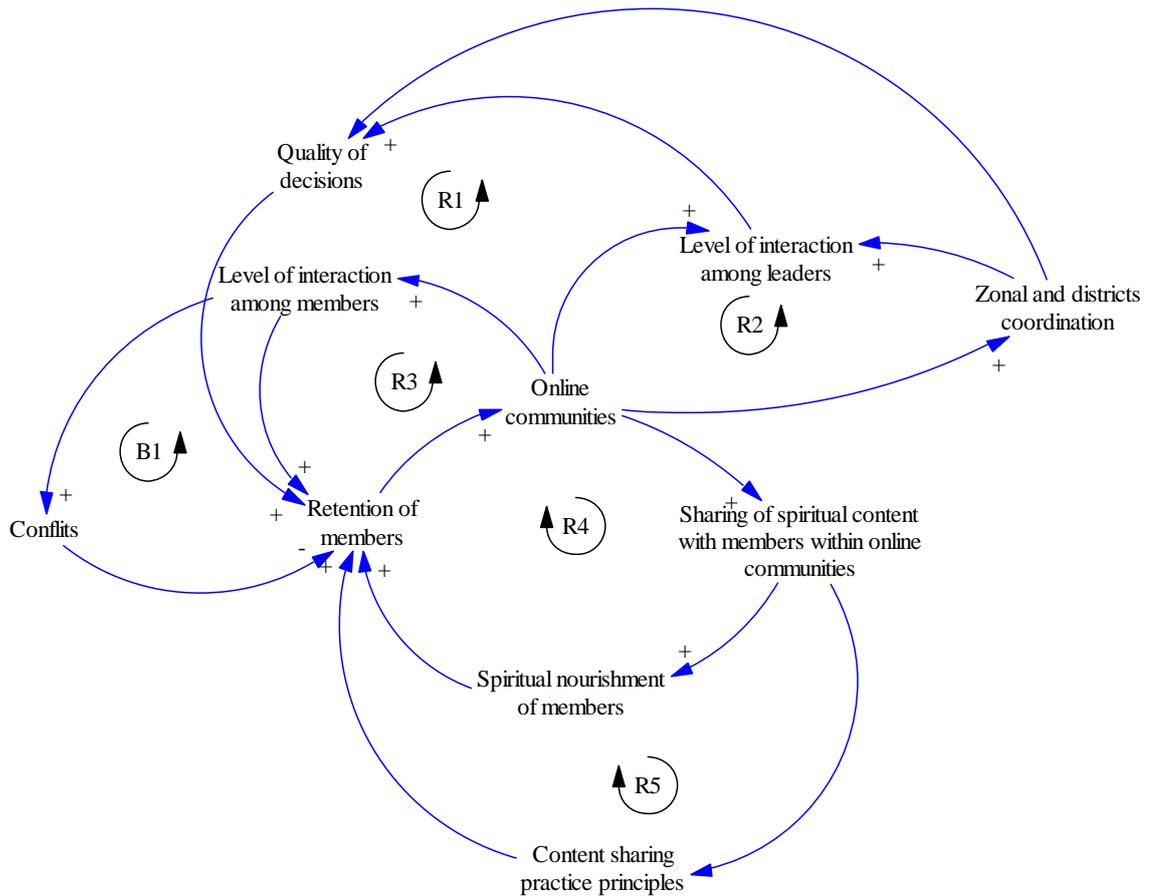


**Figure 6. The causal effect of sharing content with online communities on sharing practices**

Participants also mentioned the issue of infighting within these groups that may affect the church in the end. Participant P08 said, “*There was an issue with the pastors and we were still discussing it as pastors but whilst we were still discussing the issue, someone posted it on Facebook*”. This shows the challenges that could be encountered by the church.

#### **4.2 Causal Loop Diagram**

We used variables identified from the qualitative data and literature review to develop the causal loop diagram (CLD). Figure 7 shows the church sustainability CLD, which consists of 6 main causal loops, made up of 5 reinforcing (R) loops and 1 balancing (B) loop. The reinforcing loops have exponential growth, while the balancing loop tries to bring a system to the desired state and keep it there. These main causal loops are discussed in this section.



**Figure 1. Causal Loop Diagram showing Church Sustainability**

### Reinforcing Loop 1 (R1)

The use of online communities could improve the interaction levels among church leaders. Good interactions among church leaders could lead to quality decisions, as decisions are made timeously. Quality decisions could satisfy the needs of church members, leading to higher retention of members. More members could lead to more online communities that address the needs of different church members. When online communities increase, they reach a certain size where they break into yet smaller unregulated or regulated communities (Plant, 2004).

### Reinforcing Loop 2 (R2)

Having online communities that support the needs of zonal and district church leaders improves the interaction level of church leaders. With online communities, the leaders that form the zonal and district leadership can interact online.

### Reinforcing Loop 3 (R3)

The use of online communities improves interaction among church members within these online communities. Quality interactions among members tend to improve the retention of members. When members interact well amongst themselves, they feel part of the church family. When members feel they are part of the church family they tend to stay in that church. More online communities can be formed as more members are retained in the church.

### Reinforcing Loop 4 (R4)

The use of online communities in the church can improve the sharing of spiritual content among members of online communities. Sharing of spiritual content with church members can address the spiritual needs of the members, leading to improved retention of members. The more members retained the more online communities can be created to address the different needs of members.

### Reinforcing Loop 5 (R5)

If a church uses online communities, it can improve the way church leaders share spiritual content with church members. The success of this sharing depends on complying with the sharing principles agreed upon with the members; for example, sharing inappropriate content in a church group could discourage other members from belonging to a certain group. These sharing principles could either positively or negatively affect member retention. If there is chaos within a group, people tend to leave. The more the church retains church members the more the online communities that will be required to manage these numbers.

### Balancing loop 1 (B1)

Interactions among church members in online communities could cause conflicts if not properly managed. When there are conflicts among church members, this can the retention of members will be affected, and some members will leave the church. Low retention levels could also affect the level of interaction as there could be lack of trust among members.

## **5 Discussion**

The results show the value of online technologies in creating online communities that help in addressing the needs of different church leaders and church members. Online communities were necessary for addressing the communication needs of church leaders and enabling the church leaders to minister to the needs of the members.

Church leaders were able to create online communities of church leaders such as departmental leaders, thus improving the coordination of church departments. Through these online communities, church leaders could plan together as leaders. In a way, this improved the consolidation of church programmes and helped in garnering support from other church leaders as there was clear communication regarding church programmes and activities.

Furthermore, there was better collaboration among church leaders as they could easily work together. For example, the department responsible for evangelism could work hand in hand with the department responsible for church membership and retention of church members.

Church leaders could also share information among themselves in online communities. The consistent sharing of relevant information among church leaders within these online communities could lead to the creation of rich knowledge among church leaders that could assist in decision-making. Quality of decisions could have an impact on the stability of religious organisations. Besides interaction of church leaders within a local congregation, online communities enabled church leaders at zonal and district levels to interact concerning activities. Church leaders from various assemblies that form part of zonal or district committees used online communities for easier coordination of their activities.

The use of online technologies proves beneficial to religious leaders, most of whom have multiple church responsibilities. Navigating around all their church responsibilities might be stressful in some situations as some have both local church responsibilities as well as zonal and/or district responsibilities. This could be challenging when relying on physical interactions, as interactions between religious leaders could be restricted. Restricted interactions could compromise the quality of decisions as some decisions could be done late or with minimal information.

Besides supporting church leaders, online technologies could prove beneficial in the retention of church members. With online communities, church leaders were able to maintain consistent interaction with church members with different needs such as the community of youths, couples, women's ministries, etc. The consistent connection between church leaders and members is crucial; for example, the apostle Paul from the Bible would send traditional letters to different believers such as letters to the believers in Rome and Thessalonica. These letters were meant to encourage fellow believers while apostle Paul was in different geographical locations. That way, the apostle would retain believers in the faith.

The same responsibility of member retention through nurturing still relies on church leaders. Church leaders are expected to take care of church members especially the newly baptised members through teaching them biblical truths, nurturing, guiding them in moral behaviour, and introducing them to principles of church leadership and management (Harelimana, 2014; Kiage, 2014). Online technologies can enable religious leaders to perform these functions effectively and efficiently; for example, church leaders could post devotionals to church members within their online communities.

A study by Corley (2018) concluded that building relationships among believers, praying together, assimilation and hospitality among believers were important factors for attracting and retaining church members. Church leaders could use online technologies to enable relationship building among believers and address the spiritual needs of members, such as conducting prayers in various social media groups. Findings of this study show that most church leaders were able to feed their congregations spiritually. We are of the view that those churches that do not use online technologies may have a high chance of decline in membership, especially during times of crisis such as the COVID-19 pandemic, as members lack support and encouragement. Moreover, in some instances, believers who were struggling to meet on Fridays to conduct Bible studies because of different reasons managed to conduct their services online via ZOOM. This shows the potential of online technologies in supporting the survival of religious organisations as technologies enable believers to

be connected. From the results and the discussion, it can be argued that online technologies have the potential of sustaining churches.

## **6 Conclusions, limitations and future work**

The research pointed out the value of online technologies in sustaining churches in terms of church governance and church member retention. Using online technologies, church leaders were able to create online communities that assisted in addressing the different communication and informational needs of church leaders. There was high usage of social media groups such as WhatsApp groups among church leaders and by the church at large. These social media groups were used to support church leaders as well as church members in addressing their communication and informational needs. Through online technologies, church leaders were able to address the spiritual needs of church members as they could minister to them consistently in form of daily devotionals. The study concludes that online technologies have the potential to help churches not only expand but survive, thus sustaining churches. This study only focused on religious leaders from the SDA church. This means that this research cannot be generalised to all religious organisations. Furthermore, the study did not assess the experiences of the members who are exposed to online communities. Future research can assess the experiences of members in these online communities. In the future, it would also be beneficial to conduct this research among various denominations.

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